Dec. 6, 1949 F. R. YOUNG 2,490,187

EXPANDING EARTH ANCHOR

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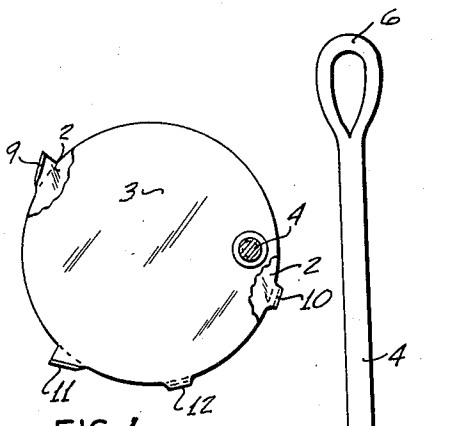


FIG. 1.

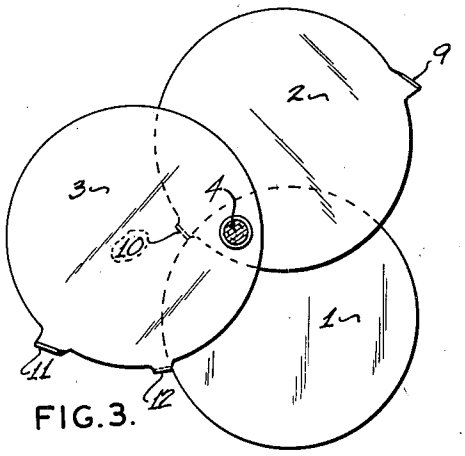


FIG. 3.

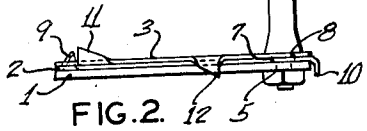


FIG. 2.

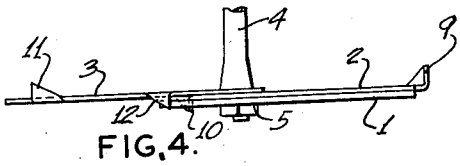


FIG. 4.

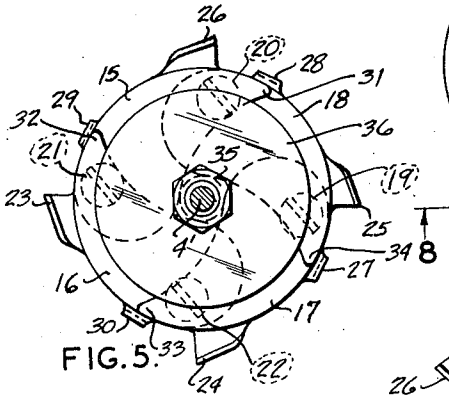


FIG. 5.

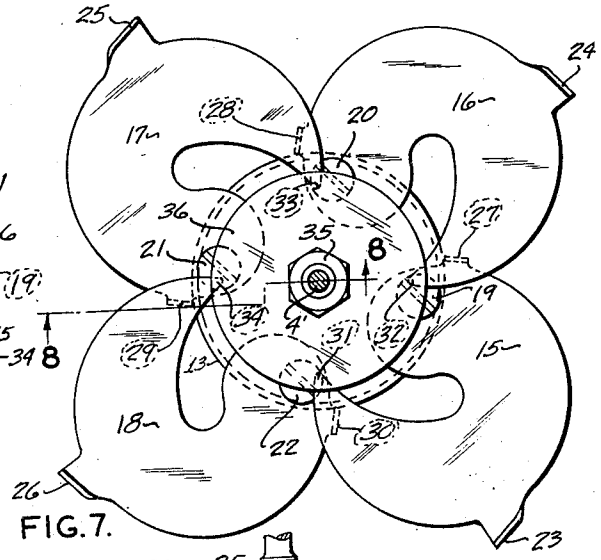


FIG. 7.

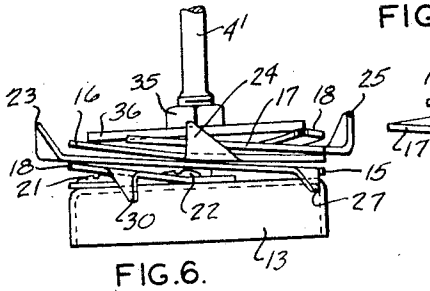


FIG. 6.

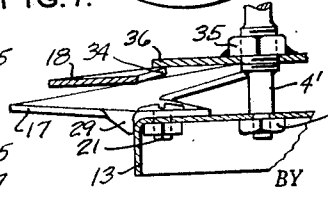


FIG. 8.

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EXPANDING EARTH ANCHOR

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1 Claim. (Cl. 189—92)

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This invention relates to expanding earth anchors particularly for holding cables or guy ropes and the like which serve to hold telephone, telegraph, or light and power line poles in place, though it can be used wherever guy ropes or cables are to be securely anchored in the ground. The principal object of the invention is to produce an anchor of this type which can be automatically installed without the use of hammers, rammers, or other means of this kind, the installation being accomplished by the movement of parts of the anchor itself by merely rotating it through its stem or shaft.

One of the main advantages of my anchor is that it can be easily and conveniently retrieved for use in another location by simply reversing the installation process, thus permitting a saving in material, and also obviating the necessity of carrying a large stock of anchors in the event of frequent moves. A further advantage of my anchor is its simplicity of design and consequent low cost of production.

Fig. 1 is a plan view of the earth anchor in closed position.

Fig. 2 is a side elevation of the anchor in closed position.

Fig. 3 is a plan view of the anchor in fully opened, operative position.

Fig. 4 is a side elevation of the anchor as shown in Fig. 3.

Fig. 5 is a plan view of a modified form of the anchor in closed position.

Fig. 6 is a side elevation of the modified form of the anchor in closed position.

Fig. 7 is a plan view of the modified form of the anchor in fully opened, operative position.

Fig. 8 is a section taken on line 8—8, Fig. 7.

The preferred form of the invention illustrated in the first four figures of the drawing comprises three blades 1, 2, and 3, respectively, of equal diameter, and while for the purposes of this specification the invention is shown as having three of these blades, it is to be understood that a greater number or only two blades may be incorporated without departing from the spirit of the invention. The blade 1 is bolted or otherwise rigidly secured at a point near its perimeter, as shown at 5, to the lower end of a vertical anchor rod 4 provided at its upper end with a loop 6 for easy manipulation. The blades 2 and 3 are pivotally attached to the rod 4 at points 7 and 8 near their respective perimeters, the blade 2 being intermediate of the blades 1 and 3 and all the blades being in sliding relation to each other (Fig. 3), in such a manner that when the anchor is in closed

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position the perimeters of the blades 1, 2, and 3 register exactly with one another.

At its perimeter the blade 2 has an upturned ear 9 and spaced apart therefrom a downturned ear 10, and the blade 3 has a similar upturned ear 11 and a similar downturned ear 12 at its perimeter. All of the ears 9, 10, 11, and 12 are preferably formed integrally with the blades 2 and 3, respectively, and terminate in points, and preferably the blades have sharp edges at their perimeters to facilitate their cutting into the earth.

In operation the procedure is as follows:

A hole of slightly larger diameter than the diameter of the blades 1, 2, and 3 is dug into the earth and the anchor in closed position is lowered thereinto until its blade 1 rests upon the earth at the bottom of the hole, which is of such depth that the loop 6 at the top of the rod 4 is above ground. With any suitable instrument the rod 4 is then rotated, and this rotating movement is transmitted to the blade 1 by virtue of its rigid attachment to said rod 4, the blades 2 and 3 remaining stationary for the time being because their upturned ears 9 and 11, respectively, engage the earth walls of the hole.

As the blade 1 rotates, its sharp perimetric edge cuts a horizontal groove into the earth, and as its rotating movement continues the downturned ear 10 of the blade 2 engages the edge of the blade 1, whereby the rotating movement is transmitted to the pivoted blade 2 and overcomes the retarding action of the upturned ear 9, and this movement forces the sharp blade 2 to follow the blade 1 and cut into the earth, the upturned ear 11 of the blade 3 in engagement with the earth wall of the hole serving to keep the blade 3 stationary.

The rotating movement of the blades 1 and 2 is continued until the downturned ear 12 on the blade 3 engages the edge of the blade 1. The anchor is now fully opened as shown in Figs. 3 and 4, with the blades 1, 2, and 3 lying in the earth with the weight of the undisturbed earth upon them. The rotating movement is now discontinued and the earth which has been removed may be replaced if desired. Guy ropes or cables may then be fastened to the loop 6 of the anchor rod 4, which, it will be remembered, extends above the surface of the earth if the hole has been filled in, and it is obvious that the spread of the opened blades of the anchor under the earth offers sufficient resistance to any strain that may be put upon them.

When the anchor is to be retrieved for use in

another location (in which case the earth is not replaced in the hole), movement in the opposite direction is applied to the anchor rod **4**, which motion is transmitted to the blades **1** and **2** and continued until the blades **1**, **2**, and **3** have been returned to the positions shown in Figs. 1 and 2, with their perimetric edges in registration with each other, and the anchor is in closed position. It can now be lifted out of the hole and is ready for further use in another location.

In the modified form I have shown the anchor as having four blades, but again it is to be understood that a greater or smaller number of blades may be incorporated in the structure. The lower end of the vertical rod **4'** is bolted or otherwise rigidly secured at **5'** to the top of a circular base **13** at the center of said base, and the blades **15**, **16**, **17**, and **18** are pivotally secured to the top of said base near its circumference, as shown at **19**, **20**, **21**, and **22**, respectively, and are slidable with respect to each other. The blades **15**, **16**, **17**, and **18** are provided at their sharp, perimetric edges with upturned ears **23**, **24**, **25**, and **26**, respectively, and with downturned ears **27**, **28**, **29**, and **30**, respectively, similar to the upturned ears **9** and **11** and the downturned ears **10** and **12** in the preferred form of the invention.

Each of the blades **15**, **16**, **17**, and **18** has an irregularly shaped cut-out portion extending inwardly from its perimetric edge so as to form points **31**, **32**, **33**, and **34**, respectively, and the blades are bent upwardly so that the sections terminating in the above-mentioned points will ride over the adjacent blades where the latter are pivotally secured to the base **13**, as shown most clearly in Fig. 6, for a purpose which will be hereinafter set forth.

The rod **4'** is screwthreaded near its end which is secured to the base **13**. A threaded nut **35** is adapted to engage the screwthreads on the rod **4'**, and a disk **36** is rigidly secured to the bottom surface of said nut and is provided with a central aperture which registers with the aperture of the nut **35**, so that the disk **36** will move up or down with the nut when the latter is screwed up or down on the rod **4'**. The disk **36** is of such diameter as to overlap the points **31**, **32**, **33**, and **34** when the anchor is in open position, as shown in Fig. 7.

When the modified form of the invention is to be put to use, the anchor in its closed position (Fig. 5) is lowered into the hole which has been dug in the ground until the base **13** rests upon the earth at the bottom of the hole, with the upturned ears **23**, **24**, **25**, and **26** contacting the earth walls of the hole. Rotating movement of the rod **4'** and the base **13** is then instituted, and as it continues the retarding action of the upturned ears **23**, **24**, **25**, and **26** acts to hold the blades stationary until the downturned ear **27** of the blade **15** engages the wall or edge of the base **13**, as do the downturned ears **28**, **29**, and **30**. Thus as the rotating motion continues the blades **15**, **16**, **17**, and **18** are simultaneously spread out and proceed to cut horizontal grooves into the earth surrounding the hole, until they lie in the position in the earth shown in Fig. 7, and the anchor is fully opened, with the base **13** still in position on the floor of the hole. The nut **35** and its associated disk **36** are then screwed down on the anchor rod **4'** until the disk is in tight contact with the points **31**, **32**, **33**, and **34**, thereby holding said points in open position through frictional engagement with said disk, as shown in Fig. 7.

The modified anchor just described also may be removed for further use elsewhere, and in this event the operation is the same as with the preferred form of the device; that is to say, the nut **35** and disk **36** are unscrewed, thus releasing the blades, and through movement in the opposite direction of the base **13** the blades and their upwardly bent portions are permitted to ride over each other. Through this movement the blades are returned to the position shown in Fig. 5, when the anchor is fully closed and may be lifted from the hole.

When my anchor in either its preferred or modified form has been positioned within the earth as heretofore described, the earth which has been removed may be replaced in the hole, or if preferred a caisson or tube, formed of any suitable material and of approximately the same dimensions as the hole, may be inserted therein to keep the walls of the hole from caving in. However, such caisson or tube does not form a part of this invention and therefore has not been described.

I claim:

An expanding earth anchor comprising an anchor rod having at its lower end a rigidly secured retaining member and a plurality of pivotally secured retaining members, all of said retaining members being eccentrically mounted with respect to said anchor rod and being slidable with respect to each other, each pivotal retaining member being provided at its perimetric edge with an upturned retarding clip and with a downturned ear adapted to engage the rigid retaining member, so that rotary motion may be transmitted from said anchor rod to the rigidly secured retaining member and thence to the pivotal retaining members to expand said anchor to its open position, said retaining members being adapted to cut grooves in the earth in which the pivotal retaining members are positioned when the anchor is fully opened.

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