

Description

This invention relates to the art of plate or wing-type earth or ground anchors driven lengthwise into the ground and pulled when reaching an optimum depth to tilt into a flat transverse position for anchoring guy rods, cables or the like according to the pre-characterizing clause of claims 1, 7, 9 (US-A-4,574,539).

The anchor of US-A-4,574,539 and other heretofore known plate-type or wing-type ground anchors with drive rod sockets have had wide leading ends which are easily deflected when encountering hard ground layers or obstructions thereby causing the plate to tilt or cock relative to the driving rod. The sockets of such anchors have flat bottoms impacted by flat ends of the driving rods. Any cocking of the anchor from the on-line driving path not only increases the energy needed for advancing the anchor, but also misaligns the bottom of the socket with the driving end of the drive rod to minimize the area of contact causing an off center impact to further shift the anchor from its on-line driving course. The limited impact area soon causes the end of the drive rod to flatten or "mushroom" and bind in the socket preventing its withdrawal.

Further, the raised rib or ridge required for the eye hole of prior known plate or wing-type ground anchors has presented a wide blunt obstruction impeding piercing of the earth during the driving operation and further increasing the required driving energy.

It would therefore be an improvement in this art to avoid or minimize the above mentioned deficiencies of the prior known ground anchors.

Specifically it would be an improvement in this art to facilitate on-line driving of the anchor into the ground and to conserve driving energy.

It would be a further specific improvement in this art to insure full area impact zones between sockets in ground anchors and driving rods to maintain the anchor on the desired driving line.

A still further specific improvement in this art would be to facilitate piercing of the ground and free swinging of a shackle or looped end of a cable in the eye hole.

The above improvements are, according to the invention, realized by anchors according to claims 1, 7, 9.

According to this invention there is provided a rigid noncorrosive cast metal axial socket equipped plate or wing anchor capable of anchoring guy lines and the like for utility poles without yielding even under pull stress loads greater than heretofore handled without massive buried concrete anchor blocks. A preferred anchor of this invention is cast from a virtually indestructible aluminum/bronze alloy or ductile iron (preferably galvanized). While the anchors of this invention can be made in many different sizes, a very

effective anchor for utility pole guy wires is about 14 inches long, 7 inches wide, and 3-1/2 inches high at its tallest zone. Such a preferred sizing has a two inch long cruciform star point leg projecting axially forwardly from the wings. This cruciform leg has sharpened front edges and operates like a star drill to hold the anchor on its drive path even when encountering small rocks, shale, sandstone and the like. This elongated central axis star point penetrates hard layers and chips or breaks away obstructions before the wings of the plate encounter the hard layer in the soil. The chisel point action on the soil in advance of penetration by the wings or plate also decreases the driving energy required for advancing the anchor into the soil.

The leading ends of the wings are sharpened and tapered or inclined rearwardly. They are also tapered radially outward from the central socket body to thinner outer edges to further decrease earth resistance and aid in rapid penetration during the driving operation.

One pair of the cruciform sides or legs of the star point merge into the forward edges of the wings. The other pair of legs of the star point extend normal to the wings and merge rearwardly into the central axial socket defining portion of the anchor. A front or top face of the plate has a raised longitudinal ridge or rib diverging from the upright cruciform leg and sloping rearwardly to a higher level than the leg. The rear end of this ridge has a transverse eye hole therethrough and has flat sides normal to the wing behind radial shoulders of the ridge. These flat sides are straddled by either a shackle with a pin extended through the hole or the eye loop end of a cable. During the driving step the shackle or cable end is behind the shoulders and the sharpened front face of the rib or ridge plows the earth laterally away from the shackle or eye loop so that they do not form obstructions during the driving operation.

The U-shaped shackle has a threaded hole in its bight portion to receive a pull rod to tilt or rotate the anchor when it has reached its desired depth in the ground.

The trailing ends of the wing are also sharpened together with the rim around the open top of the socket. The socket has an extended lip portion beyond the wings and the rim of the socket and the lip are inclined and parallel with the sharpened edges of the wings. The lip portion is also outturned providing a curved tip diverging from the wings that will facilitate tilting of the anchor to its locking position when the pull rod or cable is tensioned.

The invention will be further understood from the showings in the drawings, forming a part of this specification, in which :

FIGURE 1 is a top face and edge perspective view of a ground anchor of this invention.

FIGURE 2 is a front face view of the anchor of FIGURE 1.

FIGURE 3 is a back face view of the anchor of FIGURES 1 and 2.

FIGURE 4 is a central longitudinal cross-sectional view of the anchor taken along the line IV-IV of FIGURE 2.

FIGURE 5 is a leading edge elevational view of the anchor taken along the line V-V of FIGURE 2.

FIGURE 6 is a trailing edge elevational view of the anchor taken along the line VI-VI of FIGURE 2.

FIGURE 7 is a front and side perspective view, with parts broken away, illustrating the manner in which the anchor is driven into the ground.

FIGURE 8 is a view similar to FIGURE 7, but illustrating the manner in which the pulling operation for setting the anchor is initiated.

FIGURE 9 is a view similar to FIGURE 8, but taken 90 degrees therefrom to illustrate the manner in which the anchor is tilted or rotated during the pulling operation.

FIGURE 10 is a view similar to FIGURE 9 showing the anchor in its fully rotated or tilted locked position and illustrating the manner in which a cable or guy wire is attached to the pull rod.

FIGURE 11 is a view similar to FIGURE 10, but illustrating the manner in which the eye end of the cable or guy wire can be attached directly to the anchor to eliminate the shackle.

In FIGURES 1-6 the reference numeral 10 designates generally a cast metal socket equipped plate or wing anchor of this invention with a front face 10a and a back face 10b. The anchor has a central longitudinal or axial tubular body 11 with wings 12, 12 radiating from the body. These wings 12, 12 are tapered from thicker portions adjacent the body to thinner outer edges.

The forward or leading end of the tubular body 11 has a projecting cruciform shaped leg 13. One pair 13a, 13a of the cruciform sides of the leg 13 are in the same plane as the wings 12, 12 and project forwardly from the sharpened front edges 12a, 12a of the wings. These edges 12a, 12a slope backwardly from the sides 13a, 13a to the outer edges of the wings.

The other pair of sides 13b, 13b, of the cruciform leg 13 are normal to the plane of the wings 12, 12 and merge into the forward end of the tubular body portion 11.

The leading edges of the sides 13a and 13b are sharpened as illustrated at 14.

The side 13b of the leg 13 normal to the front face 10a of the anchor merges into an upright rib or ridge 15 extending axially of this front face and having an eye hole rear end portion 15a which is narrower than the leading end of the rib and has flat side faces extending beyond radial shoulders 15b of the rib. The eye portion 15a has a transverse hole therethrough and a U-shaped shackle 16 has side legs straddling the side faces of the eye portion 15a and a bight portion clearing this eye portion 15a. A pin 17 secured in

the leg portions of the shackle 16 extends through the eye hole and tiltably supports the shackle on the anchor. The bight portion of the shackle has a threaded hole 16a therethrough to receive a pull rod as further hereinafter explained. The eye hole is positioned just rearwardly of the transverse center of mass of the anchor so that when the anchor is freely suspended on the pull rod its forward end will tilt downwardly at a slight angle from the horizontal. Then since most of the mass is forwardly of the pulling axis, the trailing end of the plate will swing downwardly about the leg 13 to a flatwise position.

The trailing ends of the wings 12, 12 are also sharpened as illustrated at 12b, 12b and the tubular body portion 11 extends rearwardly beyond the sharpened edges.

The tubular body 11 has a cylindrical socket 18 open at the rear end but having a round concave bottom 18a at a level above the leg 13. The socket has an open rear end defined by a rim 18b which is inclined upwardly and rearwardly from the front face 10a of the anchor to an outwardly and downwardly curved tip 19. The inclined rim is in the same plane as the sharpened trailing ends 12b, 12b of the wings 12, 12 and has its bottom portion extending forwardly from the sharpened ends with its top portion projecting beyond the sharpened ends. The degree of inclination of the lip 18b and the sharpened ends 12b, 12b is about 45° from the front face of the anchor.

The rounded bottom 18a of the socket 18 is preferably fragmental spherical but any round convex shape accommodating free tilting movement of a round bottom driving tool is satisfactory.

As shown in FIGURE 4, the socket 18 receives a drive rod 20 in loose sliding fit relation. A slight clearance of about 1/8" is desired. The driving rod 20 has a convex, preferably hemispherical, driving end 20a mating with the concave bottom 18a to provide an extended area zone of contact between the drive rod and the bottom of the socket even when the clearance relationship of the drive rod and the socket accommodate a slight degree of cocking of the anchor relative to the drive rod.

The leading end portion of the rib 15 is also sharpened providing a cutting edge 15c to plow into the ground to divert the earth to the sides of the eye portion of the rib and the shackle pivoted in the eye.

As shown in FIGURE 7, the ground anchor 10 of this invention is easily and quickly driven into the ground G by a jackhammer J driving the drive rod 20 which, as shown in FIGURE 4, has its leading end seated in the socket 18 with its rounded end 20a impacting the rounded bottom 18a of the socket. The drive rod 20 can have a hexagonal portion 20c above the cylindrical leading portion 20 for ease in connection to the jack J.

A pull rod 21 is threaded into the bight portion of the shackle 16.

In operation the pull rod 21 is positioned directly over the drive rod 20 and the front face 10a of the anchor 10 on this drive rod to address the ground G in an upright endwise position at a desired angle relative to the surface of the ground. Angles of from 30 to 90 degrees, depending on the desired angle for the guy rod or wire to be anchored, are used. As illustrated, the cruciform star point leg 13 of the anchor first enters the ground to chisel a somewhat round hole H which is then enlarged with slots S by the wings 12, 12 as they enter the ground.

The leg 13 with its four cruciform sides 13a and 13b each having sharpened leading edges 14 acts as a star drill or chisel to cut through the ground and any obstructions in the ground to facilitate entry of the wings into the ground. The drive rod 20 is sufficiently long to permit the jackhammer J to drive the anchor 10 to a desired depth in the ground. The pull rod 21 is sufficiently long to project above the ground level when the anchor 10 is driven to its desired depth in the ground. Since the entire driving operation maintains the anchor 10 in an upright position, the anchor acts as a cutting tool offering minimum resistance to the earth and preserving driving energy as it is impacted to its desired depth.

As illustrated in FIGURE 8, when the anchor 10 has been driven into the ground to the desired depth, the drive rod 20 is pulled out of the socket and removed from the ground. Since the rounded end of the drive rod and the rounded bottom of the socket provide an extended impact area, the drive rod will not be deformed during the driving operation and is easily removed from the socket and pulled from the ground back through the round hole which the central portion of the anchor has formed. Then a pulling tool T, as shown in FIGURE 8, is threaded on the upper end of the pull rod 21 and the rod 21 is pulled, as shown in FIGURE 9, to tilt the anchor 10 about the leg 13 from its upright position to a transverse position in the ground. This tilting of the anchor 10 is facilitated by the placing of the eye hole rearwardly of the transverse center of mass of the anchor and the curved tip or lip 19 on the inclined rim 18b of the anchor. The hole H in the ground formed rearwardly of the leg lessens resistance to the tilting or rotation about the leg. During the pulling operation the shackle 16, of course, pivots in the eye hole and the sharpened leading and trailing edges of the wings together with the sharpened edge 15c of the ridge 15 ease displacement of the ground to facilitate the tilting.

When the anchor 10 has been pulled to its transverse or flat position in the ground, as shown in FIGURE 10, the pulling tool T is removed from the pull rod 21 and a thimble 23 is threaded onto the upper end of the pull rod providing an eye hole 23a for receiving the eye end of a guy rod or guy wire 24. The other end of the guy rod or wire 24 is attached to a utility pole, a tree, or any upright structure to be anchored to the

ground.

FIGURE 11 illustrates the manner in which a cable 25 can be used in place of the pull rod 21. In this arrangement the shackle 16 is not used and the cable 25 is provided with an eye end 25a extending through the hole of the eye in place of the pin 17. The eye end 25a of the cable will pivot in the eye hole in the same manner as the shackle 16 and the cable 25 can be pulled in the same manner as the pull rod 21 to set the anchor in the ground and to be attached to the pole or other structure to be anchored.

From the above descriptions it should therefore be understood that this invention improves the art of plate or wing-type ground anchors by facilitating insertion of the anchor into the ground and rotation of the anchor to its locked position in the ground. The anchors of this invention have extensive anchoring surfaces which when inserted upright or edgewise into the ground offer little resistance to ground penetration and rotation to a locking position when penetrated to the desired depth.

Claims

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1. A ground anchor which comprises a generally rectangular rigid plate member (10) having a tubular longitudinal central body portion (11), wings (12, 12) radiating laterally from the body portion (11) along the length thereof, said body portion (11) having a raised longitudinal rib (15) with an eye portion (15a), a pull member (16, 25a) pivotably mounted in the eye (15a), said tubular body portion (11) having a socket (18) along the length thereof adapted to receive a drive rod (20) for driving the anchor into the ground, said socket (18) having an open top with an inclined lip (18b) projecting rearwardly from trailing ends (12b, 12b) of the wings (12, 12), and said lip (18b) and said trailing and leading ends (12a, 12b) of the wings (12, 12) being sharp to facilitate rotation of the anchor in the ground, characterized in that

a central axial leg portion (13) is provided projecting from the body portion (11) forwardly of the wings (12, 12) and having radiating sides (13a, 13b) with sharpened leading edges (14) forwardly of the wings (12, 12),

said rib (15) diverges rearwardly from the leg portion (13) and has a sharpened leading edge (15c) effective to plow earth to the sides of the body portion (11), said eye portion (15a) of the rib (15) has radial shoulders (15b) in advance of the eye (15a), the pivoting axis of the pull member (16, 25a) is located behind said shoulders, and the socket (18) is provided with a concave round bottom (18d).

2. The ground anchor of claim 1, characterized in that said pull member includes a U-shaped shackle (16) with legs straddling the rib portion (15) behind the

In operation the pull rod 21 is positioned directly over the drive rod 20 and the front face 10a of the anchor 10 on this drive rod to address the ground G in an upright endwise position at a desired angle relative to the surface of the ground. Angles of from 30 to 90 degrees, depending on the desired angle for the guy rod or wire to be anchored, are used. As illustrated, the cruciform star point leg 13 of the anchor first enters the ground to chisel a somewhat round hole H which is then enlarged with slots S by the wings 12, 12 as they enter the ground.

The leg 13 with its four cruciform sides 13a and 13b each having sharpened leading edges 14 acts as a star drill or chisel to cut through the ground and any obstructions in the ground to facilitate entry of the wings into the ground. The drive rod 20 is sufficiently long to permit the jackhammer J to drive the anchor 10 to a desired depth in the ground. The pull rod 21 is sufficiently long to project above the ground level when the anchor 10 is driven to its desired depth in the ground. Since the entire driving operation maintains the anchor 10 in an upright position, the anchor acts as a cutting tool offering minimum resistance to the earth and preserving driving energy as it is impacted to its desired depth.

As illustrated in FIGURE 8, when the anchor 10 has been driven into the ground to the desired depth, the drive rod 20 is pulled out of the socket and removed from the ground. Since the rounded end of the drive rod and the rounded bottom of the socket provide an extended impact area, the drive rod will not be deformed during the driving operation and is easily removed from the socket and pulled from the ground back through the round hole which the central portion of the anchor has formed. Then a pulling tool T, as shown in FIGURE 8, is threaded on the upper end of the pull rod 21 and the rod 21 is pulled, as shown in FIGURE 9, to tilt the anchor 10 about the leg 13 from its upright position to a transverse position in the ground. This tilting of the anchor 10 is facilitated by the placing of the eye hole rearwardly of the transverse center of mass of the anchor and the curved tip or lip 19 on the inclined rim 18b of the anchor. The hole H in the ground formed rearwardly of the leg lessens resistance to the tilting or rotation about the leg. During the pulling operation the shackle 16, of course, pivots in the eye hole and the sharpened leading and trailing edges of the wings together with the sharpened edge 15c of the ridge 15 ease displacement of the ground to facilitate the tilting.

When the anchor 10 has been pulled to its transverse or flat position in the ground, as shown in FIGURE 10, the pulling tool T is removed from the pull rod 21 and a thimble 23 is threaded onto the upper end of the pull rod providing an eye hole 23a for receiving the eye end of a guy rod or guy wire 24. The other end of the guy rod or wire 24 is attached to a utility pole, a tree, or any upright structure to be anchored to the

ground.

FIGURE 11 illustrates the manner in which a cable 25 can be used in place of the pull rod 21. In this arrangement the shackle 16 is not used and the cable 25 is provided with an eye end 25a extending through the hole of the eye in place of the pin 17. The eye end 25a of the cable will pivot in the eye hole in the same manner as the shackle 16 and the cable 25 can be pulled in the same manner as the pull rod 21 to set the anchor in the ground and to be attached to the pole or other structure to be anchored.

From the above descriptions it should therefore be understood that this invention improves the art of plate or wing-type ground anchors by facilitating insertion of the anchor into the ground and rotation of the anchor to its locked position in the ground. The anchors of this invention have extensive anchoring surfaces which when inserted upright or edgewise into the ground offer little resistance to ground penetration and rotation to a locking position when penetrated to the desired depth.

Claims

1. A ground anchor which comprises a generally rectangular rigid plate member (10) having a tubular longitudinal central body portion (11), wings (12, 12) radiating laterally from the body portion (11) along the length thereof, said body portion (11) having a raised longitudinal rib (15) with an eye portion (15a), a pull member (16, 25a) pivotably mounted in the eye (15a), said tubular body portion (11) having a socket (18) along the length thereof adapted to receive a drive rod (20) for driving the anchor into the ground, said socket (18) having an open top with an inclined lip (18b) projecting rearwardly from trailing ends (12b, 12b) of the wings (12, 12), and said lip (18b) and said trailing and leading ends (12a, 12b) of the wings (12, 12) being sharp to facilitate rotation of the anchor in the ground, characterized in that a central axial leg portion (13) is provided projecting from the body portion (11) forwardly of the wings (12, 12) and having radiating sides (13a, 13b) with sharpened leading edges (14) forwardly of the wings (12, 12), said rib (15) diverges rearwardly from the leg portion (13) and has a sharpened leading edge (15c) effective to plow earth to the sides of the body portion (11), said eye portion (15a) of the rib (15) has radial shoulders (15b) in advance of the eye (15a), the pivoting axis of the pull member (16, 25a) is located behind said shoulders, and the socket (18) is provided with a concave round bottom (18d).

2. The ground anchor of claim 1, characterized in that said pull member includes a U-shaped shackle (16) with legs straddling the rib portion (15) behind the



shoulders (15b) and a bight portion overlying the rib (15), a pivot pin (17) extending through the eye portion (15a) secured to the legs of the shackle (16), and a threaded hole (16a) in the bight portion of the shackle (16).

3. The ground anchor of claim 1, characterized in that the sides of the central axis leg portion (13) include a pair of sides (13a) in the plane of the wings (12, 12) and a second pair of sides (13b) normal to said plane.

4. The ground anchor of claims 1-3, characterized in that the radiating sides (13a, 13b) of the central axial leg portion (13) are arranged in cruciform relation to provide a star drill for piercing the ground.

5. The ground anchor of claims 1-4, characterized in that the inclined lip (18b) of the open top of the socket (18) has a rearwardly curved tip (19) facilitating rotation of the anchor in the ground.

6. The ground anchor of claims 1-5, characterized by a drive rod (20) with a convex rounded bottom (20a) tiltably mating with the concave round bottom (18a) of the socket (18).

7. A wing-type ground anchor which comprises a rigid plate (10) having a central longitudinal tubular body portion (11), wings (12, 12) radiating from the body portion along the length thereof, a raised rib (15) with an eye hole (15a) therethrough on the body portion, a shackle (16) straddling said rib (15), a pin (17) pivotably mounted in said shackle (16) in the eye hole of the rib, said body portion having a longitudinal socket (18) along the length thereof with a closed bottom (18a) and an open top, and said open top having an inclined lip (18b) projecting behind trailing ends (12b, 12b) of the wings (12, 12), characterized in that

a cruciform shaped leg (13) is provided on the body portion (11) extending forwardly from the wings (12, 12),

the raised rib (15) is merged into one of the sides (13b) of the cruciform shaped leg (13) and the closed bottom (18a) is in a concave form.

8. The ground anchor of any of the preceding claims, characterized in that the wings (12, 12) have sharpened leading edges (12a, 12a) diverging rearwardly from the tubular body portion (18).

9. A plate type anchor to be driven edgewise into the ground and rotated in the ground to a flatwise anchoring position which comprises a rigid plate (10) having an axial tubular body portion (11) with an open top and closed bottom (18a), a pair of wings (12, 12) radiating laterally from said body portion (11) along the length thereof having leading edges (12a, 12a) and trailing edges (12b, 12b) at the open top of the body portion (11), a raised axial rib (15) on the body portion (11) and a transverse hole through said rib (15) for receiving a pull member (16, 25a) to rotate the plate to its flatwise position in the ground, characterized in that

a leg (13) is provided projecting forwardly from said body portion (11),

the leading edges (12a, 12a) of the wings (12, 12) are positioned rearwardly of the leg (13),

the rib (15) diverges both laterally and radially from the leg (13) to a trailing end (15a) forwardly of the open top, and

the transverse hole is provided through the trailing end (15a) of the rib (15).

10. The ground anchor of any of the preceding claims, characterized in that the rigid plate is a cast non-corroding metal alloy.

15 Ansprüche

1. Grundanker, der ein im wesentlichen rechteckiges festes Plattenelement (10) mit einem rohrförmigen länglichen zentralen Körperabschnitt (11), Flügeln (12, 12), die sich lateral von dem Körperabschnitt (11) entlang dessen Länge weg erstrecken, wobei der Körperabschnitt (11) eine erhabene Längsrippe (15) mit einem Augenabschnitt (15a) aufweist, einem gelenkig an dem Auge (15a) montierten Zugelement (16, 25a), wobei der rohrförmige Körperabschnitt (11) eine Hülse (18) entlang seiner Länge zur Aufnahme einer Treiberstange (20) zum Eintreiben des Ankers in den Grund aufweist, wobei die Hülse (18) mit einem offenen oberen Teil mit geneigten, sich von nachlaufenden Enden (12b, 12b) der Flügel (12, 12) nach hinten vorspringenden Lippen versehen ist, und die Lippe (18b) und das nachlaufende und das führende Ende (12a, 12b) der Flügel (12, 12) scharf sind, um die Drehung des Ankers in dem Grund zu ermöglichen, dadurch gekennzeichnet, daß ein zentraler, axialer Schenkelabschnitt (13) vorgesehen ist, der sich von dem Körperabschnitt (11) von den Flügeln (12, 12) aus nach vorne erstreckt und strahlenförmig verlaufende Seiten (13a, 13b) mit geschärften führenden Kanten (14) vor den Flügeln (12, 12) aufweist, wobei die Rippe (15) von dem Schenkelabschnitt (13) aus nach hinten auseinanderläuft und eine geschärfte führende Kante (15c) aufweist, die den Boden zu den Seiten des Körperabschnitts (11) pflügt, der Augenabschnitt (15a) der Rippe (15) radiale Schultern (15b) vor dem Auge (15a) aufweist, die gelenkige Achse des Zugelements (16, 25a) sich hinter den Schultern befindet und die Hülse (18) mit einem konkaven runden Boden (18a) versehen ist.

2. Grundanker nach Anspruch 1, dadurch gekennzeichnet, daß das Zugelement einen U-förmigen Schäkel (16) mit über den Rippenabschnitt (15) hinter den Schultern (15b) übergreifenden Schenkeln und einem über der Rippe (15) liegenden Stegababschnitt, einem sich in den Schenkeln des Schäkels (16) befestigten, sich durch den den Augenabschnitt (15a) erstreckenden Gelenkstift (17) und einem



Gewindeloch (18a) in dem Stegabschnitt des Schäkels (16) aufweist.

3. Grundanker nach Anspruch 1, dadurch gekennzeichnet, daß die Seiten des zentralen axialen Schenkelabschnitts (13) ein Seitenpaar (13a) in der Ebene der Flügel (12, 12) und ein zweites Seitenpaar (13b), das rechtwinklig zu der Ebene verläuft.

4. Grundanker nach den Ansprüchen 1 bis 3, dadurch gekennzeichnet, daß die strahlenförmig verlaufenden Seiten (13a, 13b) des zentralen axialen Schenkelabschnitts (13) kreuzförmig angeordnet sind, um einen in den Boden eindringenden Stern drill zu schaffen.

5. Grundanker nach den Ansprüchen 1 bis 4, dadurch gekennzeichnet, daß die geneigte Lippe (18b) des oberen Teiles der Hülse (18) eine nach hinten gebogene Spitze (19), die eine Drehung des Ankers in den Grund ermöglicht.

6. Grundanker nach den Ansprüchen 1 bis 5, gekennzeichnet durch eine Treiberstange (20) mit einem konvex gerundeten (20a), der kippbar mit dem konkaven runden Boden (18a) der Hülse (18) in Eingriff ist.

7. Grundanker vom Flügeltyp, der eine feste Platte (10) mit einem zentralen, sich längs erstreckenden rohrförmigen Körperabschnitt (11), Flügeln (12, 12), die sich strahlenförmig von dem Körper entlang dessen Länge weg erstrecken, einer erhabenen Rippe (15) mit einem durch diese verlaufenden Augenloch (15a) auf dem Körperabschnitt, einem Schäkel (16), der die Rippe (15) übergreift, einem Stift (17), der in dem Schäkel (16) in dem Augenloch der Rippe drehbar befestigt ist, wobei der Körperabschnitt eine sich entlang seiner Länge erstreckende längliche Hülse (18) mit einem geschlossen Boden und einem geöffneten oberen Teil aufweist, und der offene obere Teil eine geneigte Lippe (18b) aufweist, die hinter die nachlaufenden Enden (12b, 12b) der Flügel (12, 12) vorspringt, dadurch gekennzeichnet, daß auf dem Körperabschnitt (11) ein kreuzförmiger Schenkel (13) vorgesehen ist, der sich von den Flügeln (12, 12) nach vorne erstreckt, wobei die erhabene Rippe (15) in eine der Seiten (13b) des kreuzförmigen Schenkels (13) übergeht und der geschlossene Boden (18a) konkav geformt ist.

8. Grundanker nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die Flügel (12, 12) geschärfte führende Kanten (12a, 12a) haben, die von dem rohrförmigen Körperabschnitt (18) nach hinten auseinanderlaufen.

9. Anker vom Plattentyp, der über die Kante in den Boden eingetrieben und in dem Boden in eine flache Ankerposition gedreht wird, mit einer festen Platte (10), mit einem axialen rohrförmigen Körperabschnitt (11) mit einem offenen oberen Teil und einem geschlossenen Boden (18a), einem Paar von Flügeln (12, 12), die sich lateral von dem Körperabschnitt (11) nach außen über dessen Länge erstrecken und mit

führenden Kanten (12a, 12a) und nachlaufenden Kanten (12b, 12b) an dem oberen Teil des Körperabschnitts (11) versehen sind, einer erhabenen axialen Rippe (15) auf dem Körperabschnitt (11) und einer Querbohrung durch die Rippe (15) zur Aufnahme eines Zuelements (16, 25a) zur Drehung der Platte in ihre flache Position in dem Boden, dadurch gekennzeichnet, daß ein Schenkel (13) vorgesehen ist, der sich von dem Körperabschnitt (11) nach vorne erstreckt, die führenden Kanten (12a, 12a) der Flügel (12, 12) hinter dem Schenkel (13) angeordnet sind, die Rippe (15) sowohl lateral als auch radial von dem Schenkel (13) zu einem nachlaufenden Ende (15a) vor dem oberen Teil auseinanderläuft, und die Querbohrung durch das nachlaufende Ende (15a) der Rippe (15) verläuft.

10. Grundanker nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die feste Platte eine gegossene nicht korrodierende Metallegerung ist.

Revendications

1. Ancrage au sol qui comprend un élément (10) de plaque rigide généralement rectangulaire ayant une partie de corps centrale longitudinale tubulaire (11), des ailettes (12, 12) rayonnant latéralement à partir du corps (11) sur la longueur de ce dernier, ladite partie de corps (11) présentant une nervure longitudinale surélevée (15) avec une partie d'oeillet (15a), un élément d'enfoncement (16, 25a) monté en pivotement dans l'oeillet (15a), ladite partie de corps tubulaire (11) ayant une douille (18) sur sa longueur conçue pour recevoir un piquet d'enfoncement (20) pour enfoncer l'ancrage dans le sol, ladite douille (18) comportant une partie supérieure ouverte avec un rebord incliné (18b) faisant saillie vers l'arrière des extrémités arrière (12b, 12b) des ailettes (12, 12), et ledit rebord (18b) ainsi que lesdites extrémités arrière et avant (12a, 12a) des ailettes (12, 12) étant pointus pour faciliter la rotation de l'ancrage dans le sol, caractérisé par le fait qu'une partie axiale centrale de jambage (13) est installée en saillie par rapport à la partie du corps (11) vers l'avant des ailettes (12, 12) et comportant des côtés rayonnants (13a, 13b) ayant des arêtes avant pointues (14) vers l'avant des ailettes (12, 12), par le fait que ladite nervure (15) dévie vers l'arrière par rapport à la partie de jambage (13) et comporte une arête avant pointue (15c) efficace pour envoyer la terre vers les côtés de la partie de corps (11), par le fait que ladite partie d'oeillet (15a) de la nervure (15) comporte des épaulements (15b) orientés dans la direction radiale en avant de l'oeillet (15a), l'axe de pivotement de l'élément de tirage (15, 25a) étant situé derrière lesdits épaulements, et par le fait que la douille (18) comporte un fond concave arrondi (18d).



2. Ancrage au sol selon la revendication 1, caractérisé par le fait que ledit élément d'enfoncement comprend une manille en forme de U (16) ayant des jambages qui enjambent la partie de nervure (15) derrière les épaulements (15b) et une partie transversale au-dessus de la nervure (15), un axe de pivotement (17) traversant la partie d'oeillet (15a) fixé au jambage de la manille (16), et un orifice fileté (16a) dans la partie transversale de la manille (16).

3. Ancrage au sol selon la revendication 1, caractérisé par le fait que les côtés de la partie (13) du jambage de l'axe central comprennent deux côtés (13a) dans le plan des ailettes (12, 12) et deux autres côtés (13b) perpendiculaires à ce plan.

4. Ancrage au sol selon les revendications 1 à 3, caractérisé par le fait que les côtés rayonnants (13a, 13b) de la partie (13) du jambage de l'axe central sont disposés en relation cruciforme pour constituer un foret en étoile destiné à percer le sol.

5. Ancrage au sol selon les revendications 1 à 4, caractérisé par le fait que le bord incliné (18b) du dessus ouvert de la douille (18) comporte une pointe (19) incurvée vers l'arrière facilitant la rotation de l'ancrage dans le sol.

6. Ancrage au sol selon les revendications 1 à 5, caractérisé par le fait qu'il comporte un piquet d'enfoncement (20) ayant un fond arrondi convexe (20a) adapté en s'inclinant à l'intérieur du fond arrondi concave (18a) de la douille (18).

7. Ancrage au sol du type à ailettes qui comporte une plaque rigide (10) comprenant une partie de corps centrale longitudinale tubulaire (11), des ailettes (12, 12) rayonnant à partir du corps sur la longueur de ce dernier, une nervure surélevée (15) traversée par un orifice d'oeillet (15a) sur la partie du corps, une manille (16) enjambant ladite nervure (15), un axe (17) monté en pivotement sur ladite manille (16) dans l'orifice d'oeillet de la nervure, ladite partie de corps comportant une douille longitudinale (18) sur sa longueur dont le fond (18a) est fermé et une partie supérieure ouverte, et ladite partie supérieure ouverte comportant un rebord incliné (18b) faisant saillie derrière les extrémités arrière (12b, 12b) des ailettes (12, 12), caractérisé par le fait qu'un jambage (13) de section cruciforme est formé sur la partie de corps (11) s'étendant en avant des ailettes (12, 12), par le fait que la nervure surélevée (15) fusionne avec l'un des côtés (13b) du jambage (13) de section cruciforme et par le fait que le fond fermé (18a) a une forme concave.

8. Ancrage au sol selon l'une quelconque des revendications précédentes, caractérisé par le fait que les ailettes (12, 12) ont des arêtes avant pointues (12a, 12a) divergeant vers l'arrière par rapport à ladite partie de corps tubulaire (11).

9. Ancrage du type à plaque devant être enfoncé dans la direction des arêtes dans le sol et devant être tourné à l'intérieur du sol jusqu'à une position

d'ancrage à plat qui comporte une plaque rigide (10) comprenant une partie de corps tubulaire axiale (11) avec une partie supérieure ouverte et un fond fermé (18a), deux ailettes (12, 12) rayonnant latéralement à partir de ladite partie de corps (11) sur sa longueur avec des arêtes avant (12a, 12a) et des arêtes arrière (12b, 12b) sur la partie supérieure ouverte de la partie de corps (11), une nervure axiale surélevée (15) sur la partie de corps (11) et un orifice transversal traversant ladite nervure (15) pour recevoir un élément de tirage (16, 25a) permettant de faire tourner la plaque jusqu'à sa position à plat dans le sol, caractérisé par le fait qu'un jambage (13) est installé en saillie vers l'avant par rapport à ladite partie de corps (11), par le fait que les arêtes avant (12a, 12a) des ailettes (12, 12) sont disposées en arrière du jambage (13), par le fait que la nervure (15) est déviée à la fois latéralement et radialement par rapport au jambage (13) en direction d'une extrémité avant (15a) située en avant de la partie supérieure ouverte et par le fait qu'un orifice transversal est formé à travers l'extrémité arrière (15a) de la nervure (15).

10. Ancrage au sol selon l'une quelconque des revendications précédentes, caractérisé par le fait que la plaque rigide est moulée en un alliage métallique non corrosif.

