Feb. 14, 1928. 1,659,348

T. BIRKENMAIER

ANCHOR

Filed Aug. 16, 1926

Fig. 1.

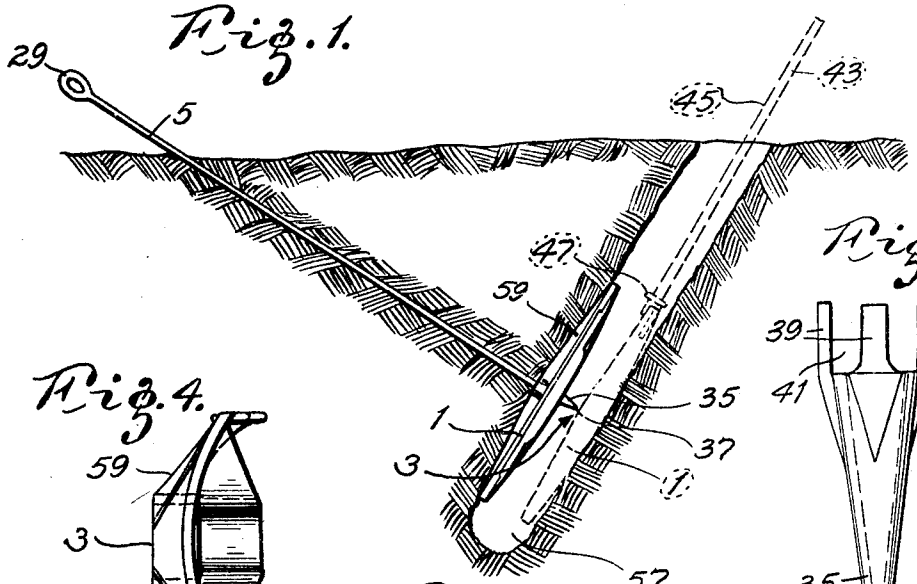


Fig. 5.

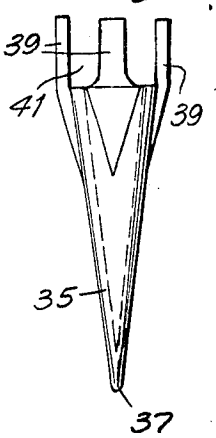


Fig. 4.

Fig. 6.

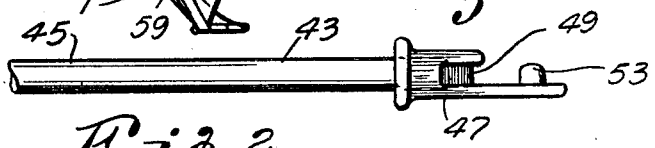


Fig. 2.

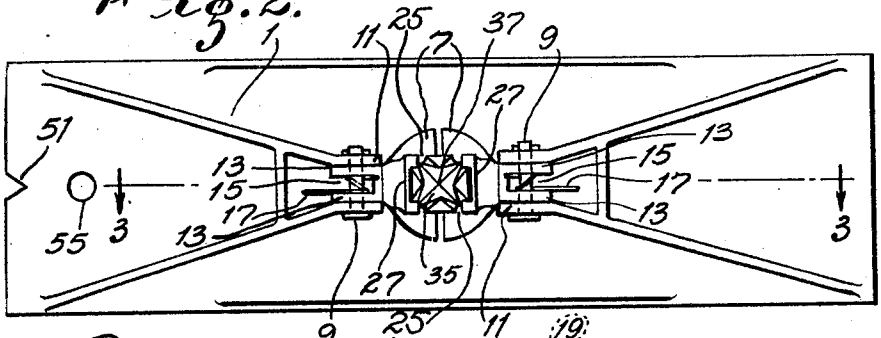
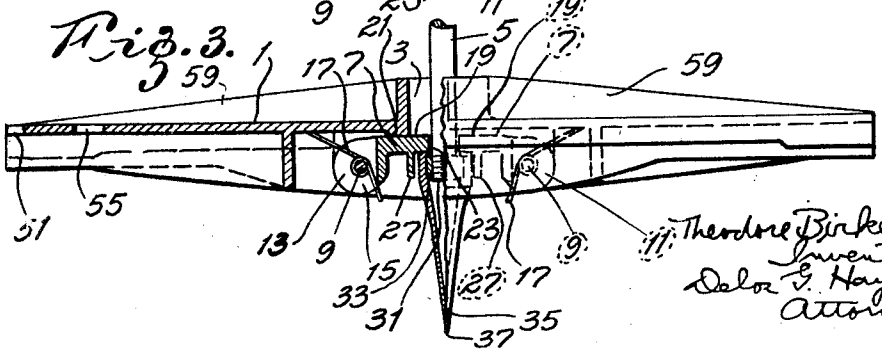


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ANCHOR.

Application filed August 16, 1926. Serial No. 129,299.

This invention relates to anchors, and with regard to certain more specific features, to earth anchors for holding guy wires and the like.

Among the several objects of the invention may be noted the provision of an earth anchor which has a maximum of resistance area consistent with ease of installation; an anchor of the class described which is adapted to automatically connect with and hold its anchor rod after said rod has been driven home; and an anchor of the class described which may be simply and economically fabricated and sold. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structure hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is illustrated one of various possible embodiments of the invention,

Fig. 1 is a section taken through the hole into which the anchor is set, showing in solid lines an anchoring position and in dotted lines a position for applying the anchor to an anchor rod;

Fig. 2 is a plan view of the bottom of the anchor, showing certain trap arms closed under the head of an anchor rod;

Fig. 3 is a longitudinal section of the anchor, parts being shown in full, showing the trap arms closed and an anchor rod applied;

Fig. 4 is an end view of the anchor;

Fig. 5 is a side elevation of a pilot head for the anchor rod; and

Fig. 6 is a detail view of the head of an installing bar.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring now more particularly to Fig. 1, there is illustrated at numeral 1 an anchor plate having a curved cross section (see Fig. 4) and properly ribbed on both surfaces for purposes of strength. A cylindrical opening 3 is provided through this plate adapted to freely accommodate the passage of an anchor rod 5 and certain other portions therewith, to be described.

On the rear concave face of said anchor plate 1 and adjacent said opening 3 are pivoted a pair of trap arms 7. These arms are pivotally supported by pins 9 held in bearing portions 11 and the bearing portions form sections of said strengthening ribs.

Each trap arm 7 comprises a pair of bearing extensions 13, between which extensions is formed a recess 15 for the purpose of retaining a reaction spring 17 therein. The spring 17 associated with each trap arm 7 tends normally to hold said arm in what will hereinafter be known as closed position, that is it holds a flattened portion 19 up against the lower substantially flat edge 21 of said cylindrical opening 3. The springs react from the plate 1 to the arms 7.

The flattened portions 19 cooperate to cover the lower end of the opening 3 except at a central opening 23 which opening is left by reason of juxtapositioned semi-circular portions taken from or left out of each of said flat portions 19. The opening 23 is adapted to slidingly fit the anchor rod 5. A socket 25 is formed below the flattened portions 19 by upstanding lugs 27 located on said trap arms.

The anchor rod, which is to be used with the anchor, comprises an ordinary rod having an eye 29 located on the upper end. The lower end of the rod is provided with screw threads 31 adapted to receive a conventional square nut 33. In order that the rod 5 may be driven into the ground, nut-end first, there is provided a piercing or pilot head 35, shown in detail in Fig. 5. The head or pilot 35 comprises a pointed end 37 on the upper end of which are formed four tines 39. The number of tines 39 to be employed is optional but depends upon the number of faces which are had on the nut 33, four in the present embodiment. The outside of the nut 33 has a sliding engagement with the inner socket 41 formed by the tines 39. The pilot is preferably made of malleable material. The outside thereof is formed to cooperate with the said socket 25 formed between the lugs 27 when the trap arms are in their closed position.

For purposes of installing the anchor plate 1 an installing rod 43 is provided. This rod 43 comprises an ordinary extension handle 45 to the end of which is fastened a head 47 comprising a wedge portion 49 adapted to engage the notch 51 formed in

one end of the anchor plate 1. Said head 47 also has a lug 53 formed thereon adapted to engage an opening 55 in said plate 1. The tolerances are such that the head 47 may be applied to an anchor plate in a manner such that the portion 49 engages the notch 51 while the lug 53 enters the opening 55. By this means the anchor plate may be held at some length from the operator.

The operation required for installing the anchor is as follows:

A hole 57 of suitable bore is drilled into the earth in a direction substantially at right angles to the direction which the anchor rod 5 is to maintain. After this the anchor rod is provided with a nut 33 and the pilot head 35 applied. The tines 39 (which are slightly longer than the depth of the nut 33) are then slightly turned over the end of the nut by applying hammer blows thereto.

Next, the anchor rod with its pilot head, is driven into the surface of the ground substantially at right angles to said hole 57 and directly toward the said hole (see Fig. 1). The driving is continued until the pilot and nut extend some distance out into the hole.

After this the anchor has the installing bar 43 applied thereto and is lowered into the hole with its convex side toward the pilot 35, that is, with the trap arms 7 on the under side. The opening 3 of the anchor plate is positioned beneath the point 37 of the pilot 35 (see dotted lines Fig. 1). Then the anchor plate is pushed laterally of the hole 57 in such a manner that the pilot 35 enters the opening 3, engages the upper face 19 of the trap arms 7 (thereby pushing them open), passes through said trap arms, and when the anchor plate touches the side of the hole 57 the trap arms spring shut (see solid lines Fig. 1). This means that the opening 23 now surrounds the anchor rod 5 (see Fig. 3).

The installing bar 43 may now be released and the anchor rod 5 drawn upwardly until the upper ends of the tines 39 engage the lower surfaces of the trap arms 7 and are socketed in socket 25. A slight twist of the anchor plate or of the anchor rod 5 may be required to align the pilot in the socket.

When a substantially longitudinal strain is put on the anchor rod 5 the tendency is to draw the nut 33 from the pilot 35, whereby the tines 39 may or may not be spread apart, depending upon the magnitude of the strain. In either case the anchor rod 5 is prevented from pulling out because either the tines 39 (if they do not expand) or the nut 33 engage the rim of the opening 23 to prevent withdrawal of the anchor rod 5. It is evident that the arms 7 trap and prevent return of the nut 33. Also, when the strain comes on the anchor rod 5, the upper end of the opening 3 and the ribs 59 on the convex surface of the anchor plate gouge into the earth to hold the anchor in place. The hole 57 is then filled in.

It is evident from the above that only a negligible percentage of the convex holding area of the anchor plate is used in permitting passage of the anchor rod 5. The result is a better holding power for this anchor.

The pilot 35 is generally not retrieved from the hole 57 before closing the hole, as it hangs in the socket 25 and on the nut 33. Its intrinsic value is low so that this feature is no disadvantage. If, before or after the hole 57 is filled with earth, it is desired to retrieve the whole anchor, this may be readily done without digging up the anchor rod 5. This is because the anchor rod 5 may at any time be unscrewed from a point on the surface of the earth, thereby unloosening the nut 33. The anchor rod 5 may then be withdrawn and the anchor plate and pilot dug out or lifted. If it is desired to prevent unscrewing of the anchor rod from the nut 33, this can be done by riveting or burring over the end of the thread on the rod after the nut has been applied. Under certain circumstances this is desirable. The operation is simple and can be performed without the use of any extra parts.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. An anchor adapted to be used with a headed anchor rod, comprising an anchor plate, an opening therethrough, separate trap arms hinged adjacent to said opening to substantially close it except at an opening between said arms adapted to accommodate said anchor rod, and means for resiliently holding the trap arms against said first-named opening, whereby the passage of the head on the anchor rod is accommodated in one direction but not in the reverse direction, after the anchor rod is positioned in said second opening between the arms.

2. An anchor comprising an anchor plate, an opening in said plate, trap arms adjacent the opening and cooperating therewith to permit the passage of the headed end of an anchor rod in one direction but not in the reverse direction and a socket behind said trap arms for non-rotatably engaging the headed end of said anchor rod.

3. An anchor comprising an anchor plate, an opening therethrough, trap arms hinged

adjacent said opening and resiliently held thereto, an anchor rod having a nut thereon forming a head, a pilot adapted to permit driving said rod through the earth, said piloted rod being adapted to open the trap arms in one direction, said trap arms preventing a return of the headed rod, and a socket formed with said arms, adapted to enfold the pilot as the trap arms close to prevent said return.

4. An anchor comprising an anchor plate, an opening in said plate, trap arms hinged adjacent the opening and cooperating therewith to permit the passage of the headed end of an anchor rod in one direction but not in the reverse direction, said trap arms being formed separately from the plate and having spring means associated therewith adapted to set said arms into a position for preventing said reverse passage.

5. An anchor comprising an anchor plate adapted to be used with a headed anchor rod, said anchor plate having an opening therein, trap arms hinged adjacent the opening to substantially close it except at an opening between said arms adapted to accommodate said anchor rod, said trap arms being formed separately from the plate and having spring means reacting from said anchor plate to said arms to set said arms into a position whereby reverse movement of the head of said rod is prevented.

6. An anchor comprising an anchor plate adapted to be used with a headed anchor rod, said anchor plate having an opening therein, trap arms hinged adjacent the opening to substantially close it except at an opening between said arms adapted to accommodate said anchor rod, said trap arms being formed separately from the plate and having spring means reacting from said anchoring plate to said arms to set said arms into a position whereby reverse movement of the head of said rod is prevented and a socket formed to the rear of said trap arm adapted to engage the head of said anchor to prevent it from turning.

7. An anchor comprising an anchor plate, an anchor rod having an enlarged head of predetermined form thereon which is adapted to be removed by turning, said anchor plate having an opening therein adapted to accommodate passage of said head, trap arms hinged adjacent the opening to substantially close it except at an opening between said arms which is adapted to accommodate said anchor rod, means for resiliently holding the trap arms against said first-named opening, whereby the passage of said head is accommodated in one direction but not in the reverse direction after the anchor rod is positioned in said second opening between the arms and a socket formed on the rear of said trap arms adapted to engage said head for preventing turning thereof.

In testimony whereof, I have signed my name to this specification this 14th day of August, 1926.

THEODORE BIRKENMAIER.