United States Patent

Versteeg

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[54] **METHOD AND APPARATUS FOR DRIVING A ROD OR A PIPE, MORE PARTICULARLY AN EARTH ELECTRODE, INTO THE GROUND**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **174/7,** 175/22, 61/53.68

[51] **Int. Cl.** **H01r 3/06**

[58] **Field of Search** 175/19, 22, 415; 61/53.68; 52/157, 155, 162; 174/6, 7

[56] **References Cited**

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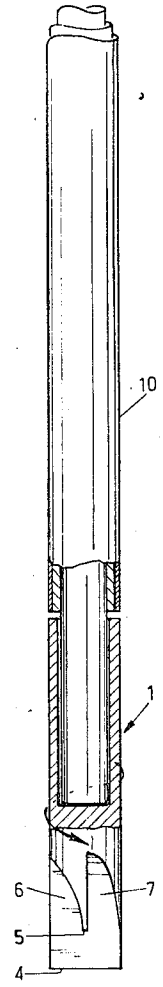
[57] **ABSTRACT**

An earth electrode assembly which is driven into the earth. The electrode comprises an elongated section and a tip portion which is rotatably mounted on the elongated section. The tip portion has blades which rotate the tip around its axis as it is driven into the ground.

2 Claims, 5 Drawing Figures



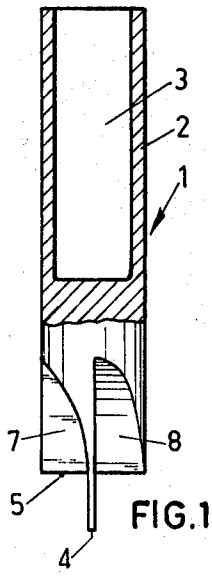


FIG.1

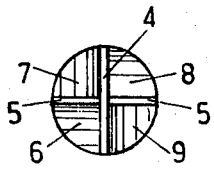


FIG.2

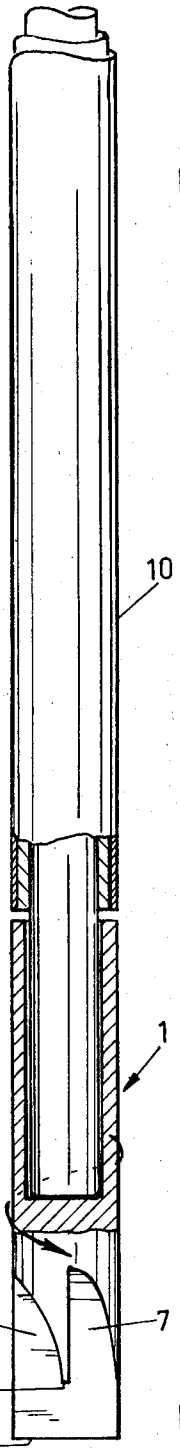


FIG.3

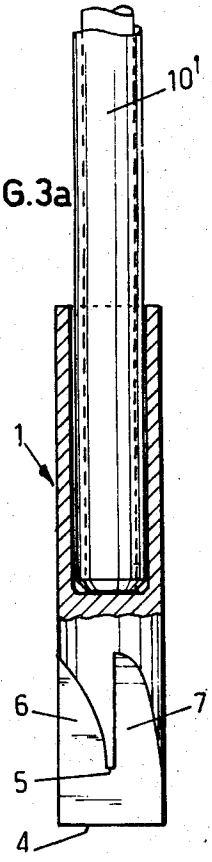


FIG.3a

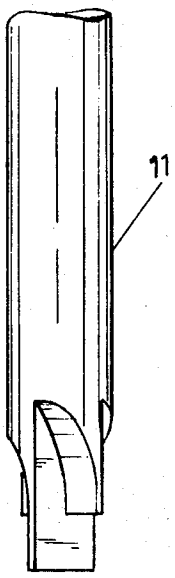


FIG.4

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METHOD AND APPARATUS FOR DRIVING A ROD OR A PIPE, MORE PARTICULARLY AN EARTH ELECTRODE, INTO THE GROUND

The invention relates to an earth electrode which is driven substantially vertically into the ground.

The driving of rod-shaped earth electrodes into the ground is faced with the problem that the penetrating end meets a lot of resistance, so that considerable forces must be exerted. Moreover, it takes a long time to drive an electrode into the ground. The necessary forces are often produced by impacting hammers which exert forces longitudinally of the electrode. With very resistant strata there is also the risk that when it is being driven into the ground the electrode will be deflected from the vertical, more particularly if it consists of a number of parts connected end to end. The electrode also often gets bent, so that it can no longer satisfactory answer its purpose. Considerable pressure is also exerted on the connecting parts between the electrodes, and when an electrode is driven into stony ground this may cause the connecting parts to crack.

An attempt has been made to obviate these disadvantages by placing a tip on the end of the rod to be driven into the ground, but this method is unsatisfactory.

To obviate these disadvantages according to the invention a freely rotatable tip having cutting surfaces and blade-shaped parts which rotate the tip around its axis while it is being driven into the ground is disposed on that end of the rod or pipe which is to be driven in. In this way the earth electrode drills its way into the ground, since while the electrode is being moved lengthwise by the forces exerted, for instance, by an impacting hammer, the tip rotates due to the forces of resistance exerted on the blade-shaped surfaces by the strata. Preferably, the tip is in the form of a sheath-shaped member having disposed at its closed end cutting surfaces and blade-shaped parts. In the open end of the sheath-shaped member an electrode rod can be disposed loose, that is freely rotatable in relation to the tip. Instead of a separate tip, the end of the electrode rod can have cutting surfaces and blade-shaped parts, in which case the rod must be rotatable in relation to the impacting hammer, or in relation to the next following part if the electrode consists of a number of parts.

Two embodiments of the invention will now be described in greater detail with reference to the drawings, wherein:

FIG. 1 is a section through a tip for the performance of the method according to the invention;

FIG. 2 is a plan view from below of the tip shown in FIG. 1;

FIG. 3 shows a tip as illustrated in FIG. 1, in which an earth electrode having a protective jacket is freely rotatably disposed;

FIG. 3*a* shows a tip as illustrated in FIG. 1, in which an earth electrode without a protective jacket is freely rotatably disposed, and

FIG. 4 shows an earth electrode, an end portion of which has cutting surfaces and blade-shaped parts.

A tip 1 has a sheath-shaped member 2 in the opening 3 whereof a rod can be inserted. At the closed end cutting surfaces 4, 5 are disposed which merge into blade-shaped parts 6–8, 9. In this embodiment the tip has two cutting surfaces 5, 4 which are disposed perpendicularly of the longitudinal axis of the tip in planes offset from one another. The bore in the tip 1 has a flat end surface, so that the earth electrode cannot get jammed when being driven in. The electrode 10, 10′ is also slightly chamfered, so that any burr formed under considerable forces has no effect. In the electrode 11 shown in FIG. 4, an end portion has cutting surfaces and blade-shaped parts performing the same functions as those on the tip shown in FIG. 1.

Tests in which an earth electrode was driven into the ground with a tip according to the invention and by the method according to the invention showed that the time required was approximately one-third of that needed to drive a pointed electrode into the ground by the conventional manner.

What I claim is:

1. An earth electrode assembly adapted to be driven into the ground, which comprises:

an elongate, cylindrical electrode provided with a cylindrical tip portion at one extremity thereof, said tip portion including longitudinally projecting blade means for easily penetrating the ground and longitudinally extending flute means for imparting rotary motion to said tip portion as same is axially penetrated into the ground, said tip portion having a longitudinally extending recess therein at the end thereof opposite said blade means, said electrode having a reduced end portion freely rotatably received in said recess and being of a size beyond said reduced end portion which is at least as large in cross section as said tip portion.

2. The earth electrode assembly as defined in claim 1 wherein said blade means comprises a first blade having a flat cutting edge extending diametrically of said tip portion, and a second blade having a flat cutting edge extending diametrically of said tip portion substantially orthogonally with respect to the cutting edge of said first blade, the cutting edge of said second blade being axially offset from the cutting edge of said first blade.

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