This invention, generally, relates to land anchors and, more particularly, to anchors for embedding in solid material to provide a means for attaching a flexible line, such as rope, wire, cable or the like. It has been recognized in the past that it is desirable to have a land anchor constructed so that it will disappear below a surface when not in use. However, such disappearing-type anchors as heretofore known have not entirely overcome the disadvantage of becoming clogged with soil or debris, which interferes with the action of the anchor. Moreover, the disappearing-type of land anchors heretofore known have been difficult if not impossible to repair once they are embedded in their operative positions.

Accordingly, it is an object of the present invention to provide a disappearing-type anchor which may be readily disassembled for cleaning and repair.

Another object of the invention is to provide a land anchor which is in a normally raised position, but which may be moved to a substantially flush-fitting position when not in use.

A further object of the invention is to provide a disappearing-type anchor of such new and improved construction as to permit it to be locked in either its raised or its lowered position.

Generally, an anchor constructed in accordance with the invention embodies a housing which is adapted to be embedded in a solid material, such as the ground or concrete, with its upper end flush with the surface of the material in which it is embedded. A plunger element is adapted to slide within a bore in the housing such that the upper surface of the plunger element may be positioned flush with the upper surface of the housing when the anchor is not in use. By the unique structural arrangement of the various component parts of the anchor, the plunger element may be removed entirely from the housing, or it may be locked in either its raised or its lowered position.

For a more complete understanding of these and other objects of the present invention, reference may be had to the description which follows and to the accompanying drawing in which:

FIG. 1 is an exploded view in perspective of a disappearing-type anchor constructed in accordance with the principles of the invention;

FIG. 2 is a view in elevation of the plunger element shown in FIG. 1; and

FIG. 3 is a view in elevation partly in cross-section of the housing shown in FIG. 1.

Referring now to an illustrative embodiment of the invention as shown in the drawing, the numeral 10 refers to a substantially cylindrical housing having an axial bore 11 extending along its length. A bottom 12 is either formed integrally with the housing 10 or is fixedly attached thereto by any suitable means, such as a plurality of threads. The housing 10 is adapted to be embedded in solid material such as the ground or concrete, and the outer surface of the housing 10 is formed of a series of serrations to present an irregular surface for increasing the frictional force between the housing and the material in which it is embedded.

At least one, and preferably two, knobs 16 and 17 project from the inner surface of the bore 11 and extend toward each other from substantially diametrically opposite positions. In addition, a coiled compression spring 18 is positioned axially within the bore 11 so that one end bears against the bottom 12. A plunger 20 is formed to slide axially within the bore 11 and is provided with diametrically opposite grooves 21 and 22, formed to receive the knobs 16 and 17, respectively. These grooves 21 and 22 extend upwardly in the surface of the plunger 20 and terminate in enlarged openings 23 and 25, respectively, which are formed to provide shoulders 24 and 30. The purpose of the shoulders 24 and 30 is to engage the knobs 16 and 17 when the plunger 20 is depressed completely within the housing 10 against the action of the compression spring 18.

Two slots 33 and 34 located substantially opposite from each other extend horizontally from the grooves 21 and 22, respectively, and provide means for locking the plunger 20 in its raised position in a manner which will be described in greater detail presently.

Above the enlarged opening 23, the plunger 20 is reduced in diameter to form a neck 26 about which a flexible line, such as wire, rope, cable or the like, may be attached. A flange 27 is formed integrally with the upper end of the neck 26 and is of an enlarged diameter, equal at least to the diameter of the plunger 20. As best seen in FIG. 2, a portion of the circumference of the flange 27 is recessed to form a shoulder 28. Therefore, the lower surface 29 of the flange 27 presents a smaller diameter which is adapted to rest on the edge 31 inside of the bore 11. The shoulder 28, then, will rest on the end surface 32 of the housing 10 to form a substantially tight joint.

The plunger 20 is provided with an enlarged, substantially cylindrical opening 36, extending axially within the plunger from its bottom surface. Thus, when the plunger 20 is inserted within the axial bore 11 of the housing 10, the opening 36 will receive the coiled compression spring 18, and the longitudinal grooves 21 and 22 will receive the projecting knobs 16 and 17, respectively. With the compression spring 18 supporting the plunger 20, the plunger 20 may be rotated counterclockwise so that the knobs 16 and 17 will move into the slots 33 and 34, respectively, to lock the plunger 20 in an extended position. In this position, the neck 26 presents a convenient means for attaching a flexible line as previously described.

However, when not in use, the plunger 20 may be rotated clockwise so that the knobs 16 and 17 again register with the grooves 21 and 22, respectively. By pressing downwardly on the upper surface 27 and then rotating the plunger element 20 in a counterclockwise direction, the knobs 16 and 17 will register with the surfaces 24 and 25. In this latter position, the flange 28 is in close engagement with the surface 32 of the housing 10.

To facilitate the turning of the plunger 20, a recess 37 is formed in the upper surface 27 and may be used to receive, for example, a extended screwdriver.

With an anchor device as described above, any clogging due to soil or other matter sitting down the axial bore 11 and becoming wedged beneath the plunger 20 will not present a serious problem. The plunger 20 may be removed entirely from the bore 11 by rotating the plunger until the knobs 16 and 17 register with the grooves 21 and 22, respectively. Then, the plunger 20 may be raised completely out of the axial bore 11, and in addition, the coiled compression spring 18 may be removed for cleaning or replacement.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the
intention, therefore, that the present invention be limited only as indicated by the scope of the following claims.

1. An anchor device comprising a housing adapted for fixed attachment at a desired location, the housing having an axial bore opening externally at its upper end, a substantially cylindrical plunger element forming part of said anchor device and attached to fit slidably within the axial bore and having an elongated cavity opening externally at its lower end, a knob projecting from the inner surface of the axial bore, a longitudinal groove in the surface of the plunger element for receiving the projecting knob an annularly directed shoulder intersecting said groove to lock said plunger in retracted position, a circumferential slot in the surface of the plunger element opening into the groove for receiving the knob to lock the plunger element in a desired position, and means within the housing and the elongated cavity for urging the plunger element in a normally extended position.

2. An anchor device comprising a substantially cylindrical housing having an axial bore therethrough, a closure plate for closing the lower end of the axial bore, a plurality of serrations in the outer surface of the housing for fixedly attaching the housing at a desired location, a knob extending from the inner surface of the axial bore, a plunger element forming part of said anchor device adapted to fit slidably within the axial bore and having an elongated cavity opening externally at its lower end, a groove extending longitudinally in the surface of the plunger element to receive the projecting knob, a slot formed in the surface of the plunger element at substantially right angles to the groove to receive the projecting knob for locking the plunger element in a projected position, means on the plunger element for attaching a flexible material, means within the housing and said elongated cavity for urging the plunger element in a normally extended position, and means to lock the plunger element in a retracted position.

3. An anchor device as set forth in claim 2, wherein a second projecting knob is provided on the inner surface of the axial bore substantially diametrically opposite the first projecting knob, and another groove extending longitudinally in the surface of the plunger to receive the second projecting knob.

4. An anchor device comprising a substantially cylindrical housing, a plurality of serrations in the outer surface of the housing for fixedly attaching the housing at a desired location, the housing having an axial bore opening externally at its upper end, two projecting knobs extending radially from the surface of the axial bore, a coil spring means extending vertically within the axial bore, a plunger element adapted to fit slidably within the axial bore, two grooves extending longitudinally along the surface of the plunger element for receiving, respectively, the two projecting knobs, a slot in the surface of the plunger element opening into each of the longitudinal grooves for locking the plunger element in its extended position, a shoulder positioned in the surface of the plunger element adjacent the upper end of each longitudinal groove for locking the plunger element in its retracted position, the upper end of the plunger element above the shoulder being constricted in diameter for attaching a loop of flexible material, the upper end surface of the plunger element having a recess for receiving a suitable tool to rotate the plunger element, and the plunger element having a substantially axial channel therein opening externally at the lower end for receiving the coiled spring.

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