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ANCHOR DEVICE WITH RELEASABLE LATCH MEANS

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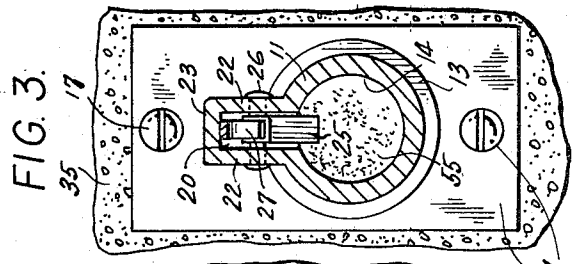


FIG. 3.

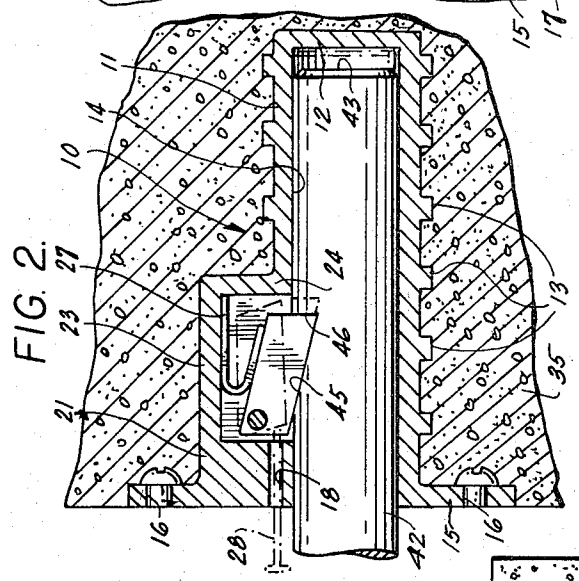


FIG. 2.

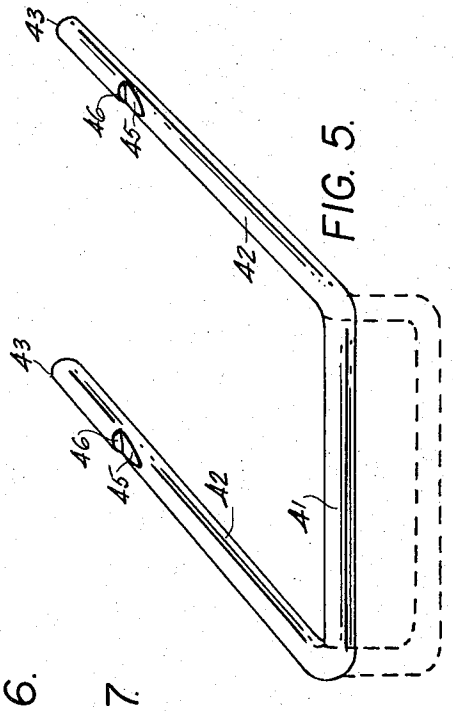


FIG. 5.

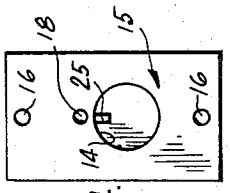


FIG. 4.

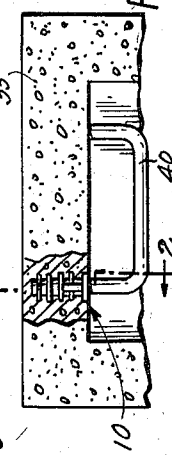


FIG. 6.

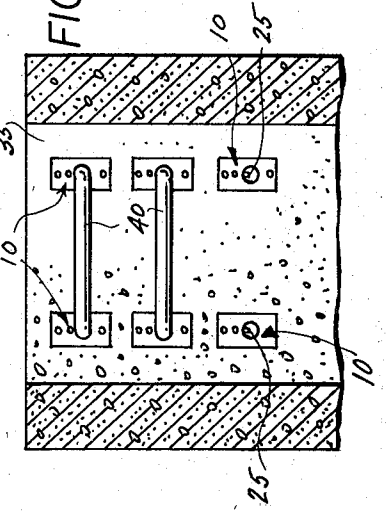


FIG. 7.

FIG. 1.

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ANCHOR DEVICE WITH RELEASABLE LATCH MEANS

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Continuation of application Ser. No. 386,335, July 30, 1964. This application July 24, 1967, Ser. No. 655,670

4 Claims. (Cl. 182—92)

This application is a continuation of Ser. No. 386,335, filed July 30, 1964 and now abandoned.

This invention relates to devices for anchoring fixtures to a poured concrete wall and, more particularly, to a novel and improved device of this type including a socket member for anchoring in the wall during pouring thereof and a fixture having a shank substantially conformingly receivable in the socket member and to be releasably latched therein, the socket member being formed with access means for releasing the latching effect for withdrawal of the fixture.

Various devices have been proposed for anchoring fixtures to poured concrete walls either permanently or disengageably. One common form of such devices have been the provision of a recess or pocket member arranged to receive a T-headed fixture. Other arrangements have involved, for example, internally threaded sleeve members into which a fixture may be screwed. Still other arrangements have involved resilient fixtures which may be snapped into position in a pocket member anchored in the wall.

The devices proposed hitherto have not proven successful commercially for various reasons. In the case of T-headed fixtures, the extent of support of the fixture within a pocket member has been insufficient to provide the desired load bearing factor for the fixture, due to deflection or bending of the fixture about its pivotal interconnection in a recess of the socket member. A further disadvantage of many of the known devices is that they are not designed for release of the fixture therefrom, as for repair or insertion of a new fixture after wear on the fixture. In such case, the only expedient is to chisel the socket member out of the wall and then to replace a complete unit in the wall with pouring of concrete around the resultant hole in the wall. This is unsatisfactory in practice, as the securement of such a repair anchorage is uncertain and not reliable.

In the case of the threaded sleeve-type of device, it will be apparent that this is inapplicable to the anchoring of U-shaped steps to a poured concrete wall, and these steps are very frequently used in manholes or the like to provide a "ladder" for access to and exit from the manhole. Accordingly, there has long been a demand for a simple, inexpensive, and secure device for anchoring a fixture to a poured concrete wall, and in which a fixture may be readily removed from a socket member when it is desired to replace the fixture or to repair the same, while still providing an effective load bearing and extended engagement between a shank of the fixture and the socket or insert member so that the fixture will stand considerable weight without pulling out of the socket member.

Accordingly, an object of the present invention is to provide an improved device for anchoring a fixture to a poured concrete wall.

Another object of the invention is to provide an improved device for anchoring a fixture to a poured concrete wall and including a socket insert for anchoring in the wall during pouring thereof, and a fixture having an elongated shank substantially conformingly insertable into the socket insert.

A further object of the invention is to provide an improved device for anchoring a fixture to a poured concrete wall, of the type just mentioned, in which the socket insert includes a pivoted latch normally projecting into a socket in the insert and engageable with a notch on a shank of the fixture, the socket insert being formed with access means to said latch for releasing the same, when desired, to permit withdrawal of the fixture from the insert.

Yet another object of the present invention is to provide an improved device for anchoring a U-shape step to a poured concrete wall and including a pair of socket inserts arranged to releasably and disengageably receive the shanks of the U-shaped step, with there being an extended longitudinal engagement between each of the shanks and the associated socket insert.

For an understanding of the principles of the invention, reference is made to the following description of a typical embodiment thereof as illustrated in the accompanying drawings.

In the drawings:

FIG. 1 is a vertical sectional view illustrating the socket insert as mounted on a form prior to pouring of a wall;

FIG. 2 is a sectional view, taken on the line 2—2 of FIG. 6, illustrating a socket insert anchored in a poured concrete wall and with the shank of a step disengageably secured therein;

FIG. 3 is a transverse sectional view, taken on the line 3—3 of FIG. 1;

FIG. 4 is a front elevation view of the socket insert;

FIG. 5 is a perspective view of a step cooperable with a pair of socket inserts;

FIG. 6 is a partial top plan view of a manhole or the like having the inventive step anchor insert incorporated therein; and

FIG. 7 is an elevation view, partly in section, corresponding to FIG. 6.

Referring first to FIGS. 1, 2 and 3, the socket insert or socket member **10** of the invention is generally in the form of a relatively elongated metal sleeve having a flange at its forward end. Insert member **10** may be cast or otherwise formed and includes a sleeve portion **11** which is relatively elongated and has a closed and inner end **12**. In the particular embodiment illustrated, sleeve portion **11** has a circular cross section, but it should be understood that the principles of the invention are applicable equally irrespective of the cross section of sleeve portion **11**. Thus, sleeve portion **11** could have a polygonal cross section, the only criteria being that it have a cross section which substantially conforms to the cross section of the shank of the fixture member to be inserted thereinto. For the purpose of providing a firm anchorage in the poured concrete wall, sleeve portion **11** is formed with a plurality of axially spaced circumferentially extending ribs **13** on its exterior surface.

The outer end of sleeve portion **11** is open and, at this outer end, insert **10** comprises a flange lying in a plane substantially perpendicular to the axis or center line of sleeve portion **11**. Flange **15** is illustrated as being a

rectangular flange which, in the direction of its longer dimension, is offset somewhat relative to the axis or center line of sleeve portion **11**. Adjacent each end, flange **15** is formed with an aperture **16** to receive a screw, nail, or other fastening element **17** by means of which insert **10** may be anchored to a pouring form indicated at **30**. As is known to those skilled in the art, such pouring forms are usually constructed of plywood sheets, such as **31**, which are reinforced or braced by wooden beams **32**, such as 2 x 4's. At a very short distance from the periphery of the outer opening into sleeve portion **11**, flange **15** is formed with a relatively elongated bore or aperture **18** for a purpose to be described.

Extending inwardly from the inner surface of flange **15**, sleeve portion **11** is formed with a generally radially extending pocket or recess **20** of substantially rectangular cross section, this recess **20** comprising a relatively thick front wall **21** merging with flange **15**, substantially parallel side walls **22**, a top wall **23**, and an end wall **24**. Bore **18** extends through wall **21** and opens outwardly of flange **15** and inwardly into pocket **20**. Adjacent wall **21**, a pin **26** extends through aligned apertures in side walls **22** and pivotally mounts a latch **25**. The apertures receiving the pin **26** may be suitably sealed with a plastic composition material, if desired, to prevent grout seepage.

As best seen in FIGS. 1 and 2, latch **25** is essentially a parallelogram in side elevation. A flat, tempered, U-shaped leaf spring **27** has one leg engaged with the inner surface of top wall **23** of pocket **20** and its opposite leg bearing against the upper surface of latch **25**. Spring **27** biases latch **25** to extend into the socket **14** formed by sleeve **11**. However, latch **25** may be swung counterclockwise about pivot pin **26** by inserting a drive pin or the like **28**, shown in FIG. 2, through aperture **18** to engage the forward end of latch **25** beneath pin **26** and swing the latch to the broken line position of FIG. 2.

In installing the insert, the latter is secured to form **30** by means of the screws, nails or other type of fastening elements **17** inserted through aperture **16**, the insert being positioned on the form at the desired location in the poured wall. After insert **10**, or a plurality of inserts **10**, as may be the case, are secured to form **30**, the concrete wall **35** is poured in the forms provided, thus anchoring insert **10** in position. During such pouring operation, bore **18** and socket **14** may be closed by suitable fibre or plastic plugs **55** and **56**, respectively, to prevent any of the pouring mixture from entering into socket **14** or bore **18**. After the wall has set and the forms are removed, the insert appears as in FIG. 2. Wall **35** may be, for example, a wall of a manhole or the like as illustrated in FIGS. 6 and 7.

The insert **10** is now ready to have a fixture anchored therein. A suitable fixture is shown in FIG. 5 as comprising a substantially rectangular U-shaped step **40** having a bight portion **41** and relatively elongated legs **42**. For the purpose of mounting a step **40**, inserts **10** have to be used in pairs as shown in FIGS. 6 and 7. Legs **42** of step **40** are formed with tapered notches **45** intermediate their lengths and nearer to their ends **43**. These notches increase in depth inwardly or toward the ends **43** of legs **42**, and terminate in relatively sharp shoulders **46**, as best seen in FIGS. 2 and 5. To mount a step **40**, its legs or shanks **42** are aligned with sockets **14** and then the step **40** is pushed inwardly. This will displace latches **25** against the force of springs **27** until the latches can snap into notches **45** to engage shoulders **46**. It should be noted that the distance of notches **45** from the ends **43** of legs or shanks **42** is such that, when latches **25** are engaged with shoulders **46**, the ends **43** of shanks **42** are spaced an appreciable distance from the end wall **12** of sleeve portion **11**. As shown in broken lines, bight end **41** of step **40** may be offset downward, if desired.

To release step **40** from inserts **10**, drive pins **28** are inserted into bores **18** and step **40** is pushed inwardly until ends **43** of legs **42** engage wall **12** of sleeve portion **11**. Drive pins **18** can then be pushed inwardly to rotate latches **25** counterclockwise to a position where they are clear of sockets **14**. Step **40** may then be readily and easily withdrawn from the inserts **10** and replaced by a similar step, if desired.

The insert **10** is not limited to use with a fixture such as the U-shaped step **40**. It can be used with any type of fixture which has a relatively elongated shank having a substantially conforming fit in socket **14**. For example, the insert **10** could be used with a plain bar arranged to project outwardly of wall **35** to form a step, or it could be used, for example, with angle-shaped bars forming a step. It can be further used with any type of fixture which has a shank corresponding in configuration and formation to a leg **42**.

It will be appreciated that there is a very extensive longitudinal engagement between legs **42** of step **40** and the insert, thus providing very extensive support for the step **40** so that a great deal of weight may be supported thereby. Furthermore, legs **42**, throughout the lengths thereof in sleeve portions **11**, are in substantially full surface-to-surface engagement with the sleeve portions. There is no danger of the step **40** pivoting, for example, as might occur with certain prior art devices. Furthermore, the step **40** can be very easily and readily removed and replaced by a similar step, if desired.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A fixture assembly for a poured concrete wall, said fixture assembly comprising, in combination, at least one socket insert for anchoring in the wall during pouring thereof, said socket insert comprising a laterally extended flange and a substantially rectilinear sleeve integral with said flange and extending normal thereto, said sleeve opening outwardly through said flange and having a closed inner end; said sleeve defining a relatively elongated socket; a pair of laterally spaced parallel walls extending rearwardly from said flange and substantially radially outwardly from said sleeve and defining, with a third wall extending therebetween and between said flange and said sleeve, an outwardly closed recess opening laterally from said socket; a pivot pin extending between said spaced parallel walls; a substantially flat latch pivoted to said pin and having a thickness substantially equal to the spacing of said parallel walls; biasing means operable between said latch and said third wall to bias said latch to project into said socket; and a fixture having at least one elongated substantially rectilinear shank substantially conformingly insertable into said sleeve with its length within said sleeve being in substantially full surface-to-surface engagement with said sleeve, and formed with a notch for locking inter-engagement with said latch to inhibit withdawal of said shank from said socket; said flange being formed with a passage extending inwardly from the outer face thereof and communicating at its inner end with said recess to receive a pin or the like to engage and pivot said latch to release the same from said notch.

2. A fixture assembly for a poured concrete wall, as claimed in claim **1**, in which said recess has said third wall extending substantially parallel to said sleeve; said latch being in the form of a substantially flat parallelogram having angles other than right angles, and being pivoted on said pin adjacent an acute angle corner of said parallelogram; said biasing means comprising a bent leaf spring having one leg engaged with a longer edge of said latch and another leg engaged with said third wall; said pin receiving passage being located at a substantial distance from said pivot pin toward said sleeve.

3. A fixture assembly for a poured concrete wall, as claimed in claim **2**, in which said notch is substantially triangular and has an edge, toward the inner end of said

shank, extending substantially perpendicular to the axis of said shank for engagement with the other acute angled corner of said latch; said notch being so located on said shank that, when said latch is engaged with said notch, the inner end of said shank is spaced from the inner end of said sleeve, whereby said fixture may be pushed inwardly to provide clearance for release of said latch from said notch.

4. A fixture assembly for a poured concrete wall, as claimed in claim 1, in which said assembly is a step anchor combination including a pair of said socket inserts in laterally spaced relation, said fixture comprising a step in the form of a substantially U-shape metal rod having a pair of said elongated shanks extending substantially normal to a bight interconnecting the same, with said shanks having a spacing equal to the lateral spacing of said inserts; each shank being insertable into a respective one of said sleeves.

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