June 25, 1963 R. H. RASMUSSEN 3,095,041

MEANS FOR INSTALLING CONCRETE WELL CASINGS

Original Filed Sept. 26, 1957 2 Sheets-Sheet 1

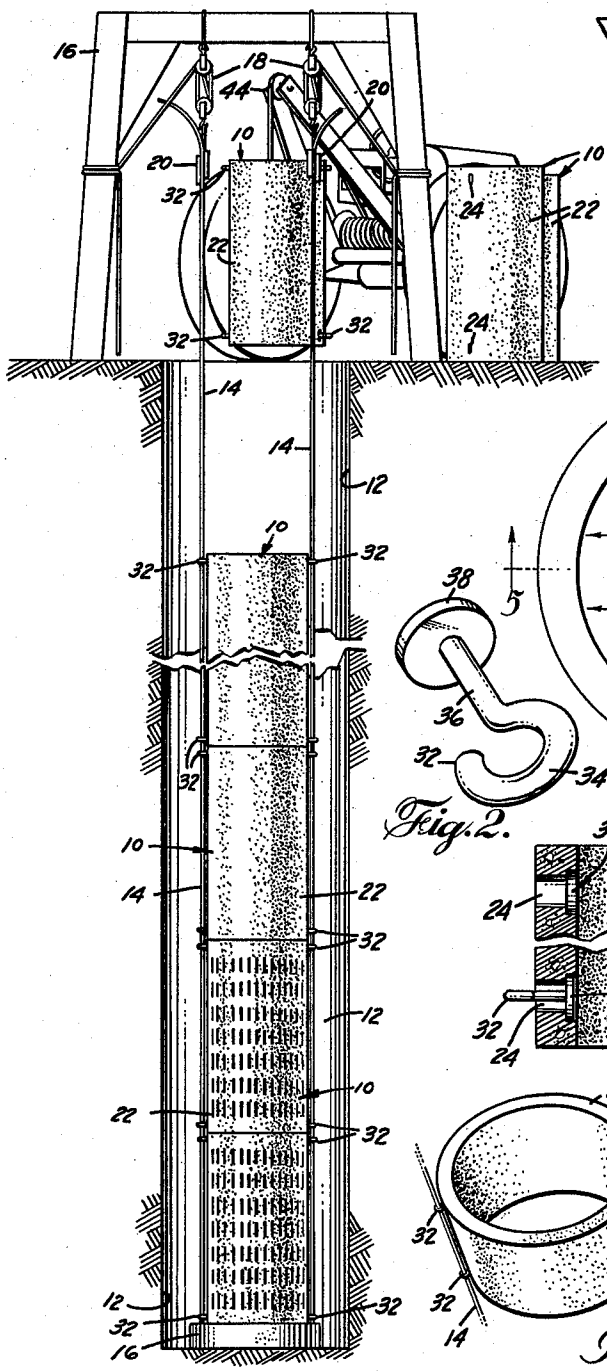


Fig. 1.

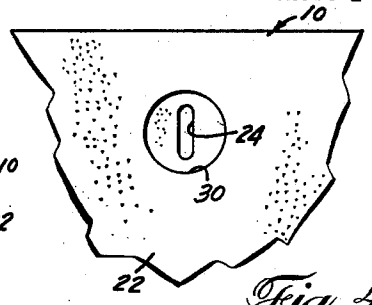


Fig. 4.

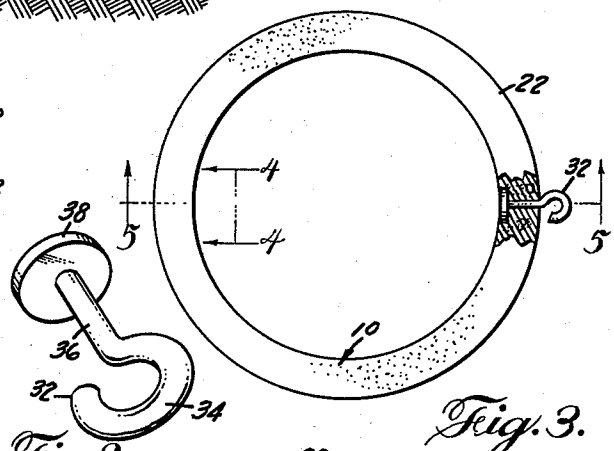


Fig. 2.

Fig. 3.

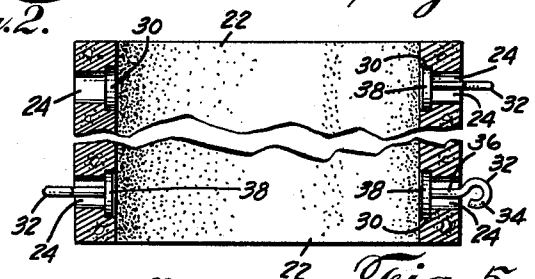


Fig. 5.

Fig. 6.

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MEANS FOR INSTALLING CONCRETE WELL CASINGS

Original Filed Sept. 26, 1957 2 Sheets-Sheet 2

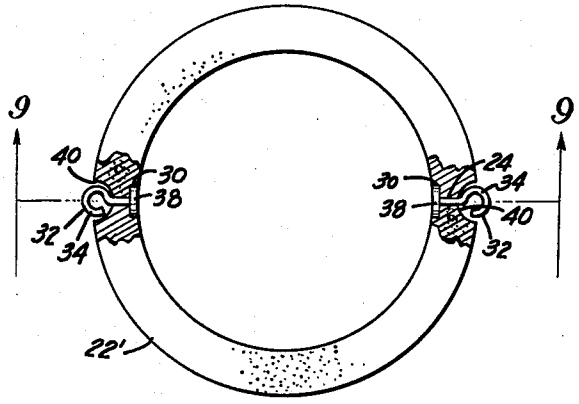


Fig. 7.

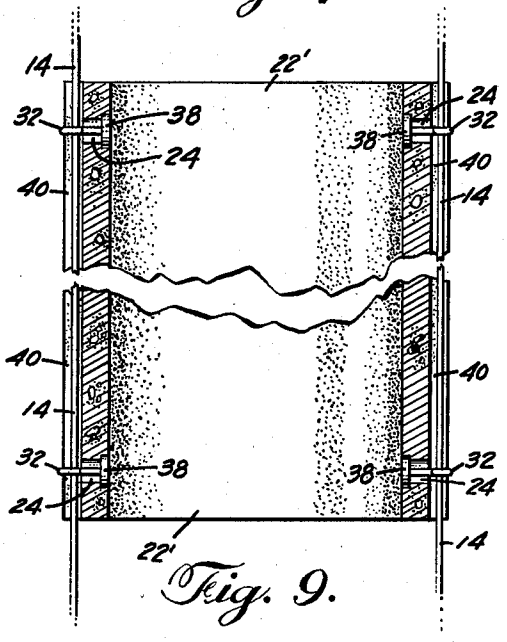


Fig. 9.

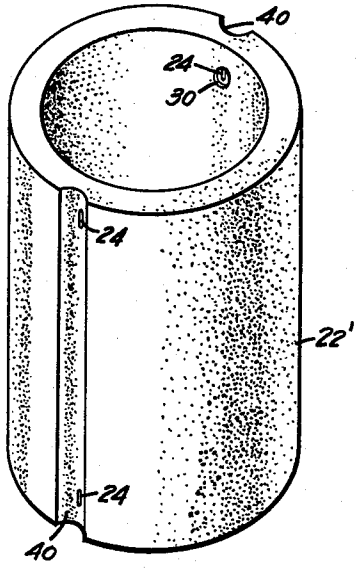


Fig. 8.

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MEANS FOR INSTALLING CONCRETE WELL CASINGS

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Continuation of application Ser. No. 686,376, Sept. 26, 1957. This application Nov. 17, 1959, Ser. No. 853,478
2 Claims. (Cl. 166—235)

This invention relates to concrete well casings and more particularly to a method and means for installing concrete well casings.

Heretofore concrete well casings of standard construction have been, of course, of cylindrical shape having two diametrically opposed longitudinal holes extending through the side walls thereof. Cables are run through the holes and are used to keep the casings in alignment as they are being lowered in the well shaft.

The cables are held taut by cable stretchers and block and tackle depending from an overhead beam or frame, whereby each time a new casing is threaded on the cables before lowering it is necessary that the cable be blocked off and clamped at ground level to insure that the cables do not become slack and then the upper portions of the cables need be released from the cable stretcher and threaded through the respective holes in the succeeding casing. The cable ends are then replaced in the cable stretcher and the slack is taken out of the cables. The clamps are removed and the casing lowered.

The holes in the walls of a well casing unit of standard construction receive the aligning cables slidably therethrough and serve to keep the casing unit properly positioned as it is lowered into the well shaft and to assure correct seating upon a previously lowered unit. But each time a succeeding unit is threaded upon the cables, the cables must be blocked and clamped at ground level and the upper ends of the cables loosened from the stretchers with the attending danger that the cables may be mis-aligned or slackened which can cause mis-alignment and binding as the unit is lowered.

It is necessary to use precision in forming the units of the standard construction to assure perfect alignment of the cable receiving holes and additional labor is necessary to "rod" the holes to insure that they are open after forming. Sometimes the units are delivered to the job-site with obstructed cable openings whereby it is necessary to assign a man to check and clean all openings.

Additional labor is needed at the job-site for handling lowering equipment, blocking and clamping the cables at ground level and threading a unit on the cables at each lowering with the attending danger that inexperienced personnel may cause a faulty installation.

It is therefore a primary object of my invention in providing a method and means for installing concrete well casing units to eliminate the said difficulties wherein the guide or aligning cables remain taut and undisturbed at all times.

A further object is to provide a concrete well casing unit in combination with eye hooks insertable through openings formed in the side walls thereof and which extend outwardly therefrom to engage about the guide cables.

Another object is to provide a method and means for installing concrete well casing units which eliminates the necessity of excessive and expensive skilled labor and wherein even unskilled labor may install a faultless well casing.

A further object of the method and means for installing well casing units of my invention is to provide a well casing unit the forming of which is of less precision and consequently more economical in manufacture.

Yet another object of my invention is to provide a method for installing concrete well casing units which allows a faster installation than heretofore with no loss of accuracy.

This is a continuation of applicant's co-pending patent application, Serial No. 686,376, filed September 26, 1957, now abandoned.

Other and further objects and advantages of the present invention will be apparent from the following detailed description, drawings and claims, the scope of the invention not being limited to the drawings themselves as the drawings are only for the purpose of illustrating a way in which the principles of this invention can be applied.

Other embodiments of the invention utilizing the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

FIGURE 1 is a schematic representation of a well illustrating the method and means for installing concrete well casing units of my invention;

FIGURE 2 is a perspective view of one of the cable engaging eye hooks which is a part of my invention;

FIGURE 3 is an end view of a concrete well casing unit with a part broken away and shown in section to reveal the disposition of one of the cable engaging eye hooks;

FIGURE 4 is an enlarged fragmentary view of a portion of the well casing unit taken along the line 4—4 of FIGURE 3 showing the eye hook opening formed in the casing;

FIGURE 5 is a longitudinal section taken along the line 5—5 of FIGURE 4 showing the eye hook openings of the well casing unit and eye hooks disposed therein in two positions of installation, the well casing unit is broken away for convenience of illustration;

FIGURE 6 is a perspective view of a well casing unit having the eye hooks in operation position engaged about the cables as would be installation of the well casing unit into a well shaft;

FIGURE 7 is an end view of a modified well casing unit of my invention with parts broken away to reveal the disposition of one pair of cable engaging eye hooks;

FIGURE 8 is a perspective view of the modified form of concrete well casing unit of my invention as would be seen before installation; and

FIGURE 9 is substantially a longitudinal section of the modified well casing unit taken along the line 9—9 of FIGURE 7 showing the disposition of the cables with respect to the casing, the casing being broken away for convenience of illustration.

In the illustrated embodiment of my invention, well casing units 10 are provided adapted to be disposed one

above the other in vertical alignment within a well shaft **12**.

A pair of guide cables **14** are suspended in the well shaft **12** to guide the lowering of the units **10** which is conventional procedure. The lower ends of the cables **14** are secured to a casing foundation or base plug **16**. Installation apparatus further includes a derrick or frame **16** disposed above the well shaft **12** from which depends a pair of spaced apart block and tackle **18**. A pair of cable clamps **20** are attached one on each of the lower hooks of a respective block and tackle **18**.

The base plug **16** with the lower ends of the cables **14** secured thereto is lowered into the shaft and seated at the bottom thereof. The upper free ends of the cables **14** are caught and held in the clamps **20** whereby the block and tackle **18** may be adjusted to remove slack from the cables **14** or "stretch" the cables against the resistant weight of the base plug **16** so that the cables **14** are taut and vertically parallel.

With reference to FIGURES 3 and 5 wherein is shown a preferred form of concrete well casing unit embodying my invention, the unit is of elongated cylindrical shape having openings or slots **24** disposed transversely through the wall thereof. The slots **24** are disposed in pairs with the slots of a pair disposed one above the other and the slots of one pair being diametrically opposed from the slots **24** of the other pair. As best seen in FIGURE 5 the slots **24** are disposed adjacent a respective end of the unit **22**.

The inner end of each slot **24** is enlarged or countersunk as seen from its inner end and as shown in FIGURE 4 and is preferably a circular shaped recess **30**.

The slots **24** are adapted to receive securing or guiding devices or connectors or cable attachment means **32** one of which is shown in detail in FIGURE 2. Each of the connectors **32** has an outer hook end or hook **34**, an intermediate shank portion **36** and a circularly shaped base **38** fixed to its inner end.

The hook ends **34** of the connectors **32** are of greater width than thickness and of a size for reception through the slots **24** only when the width of the hook end **34** is disposed lengthwise of said slot whereby said hook ends **34** can be inserted into the respective slots from the inner end thereof.

As illustrated in FIGURE 5 the connectors **32** may be inserted through the slots **24** whereby the hook end **34** extends beyond the outer surface of the unit **10**. The base **38** of the connector **32** is received in the recess **30** preventing the connector **32** from passing outwardly of the slot **24**.

Referring to FIGURE 3 it will be seen that when the connector **32** is passed through the slot **24** the connector may be locked in the slot by turning the hook **34** transversely of the slot **24** and into a normally horizontal position.

The connectors **32** are formed of bendable material and the hook ends **34** are adapted to receive and be closed about a respective cable **14** in a manner set forth in the following description of operation.

A modified form of the invention is shown in FIGURES 7, 8 and 9. The modification lies primarily in the form of concrete well casing unit designated by the numeral **22'**. The unit **22'** differs from the unit previously described only in the provision of longitudinally extending channels or grooves **40** in the outer surface thereof extending from the top to the bottom of the unit **22'**. Each of the grooves **40** adjoin a pair of slots **24** on a respective side of the unit **22'**.

In the end view of FIGURE 7 it will be seen that when the connectors **32** are passed through the slots **24**, the hook ends **34** thereof are received in the groove **40**. In the sectional view of FIGURE 9 the hook ends **34** of the connectors **32** have been secured about the cables **14** whereby the cables **14** are disposed within the respective groove **40**.

As thus described it will be seen that there is substantially no parts protruding beyond the outer surface of the unit **22'** which, I believe, may be advantageous in some particular installations.

Operation

The method and means for installing concrete well casings of my invention will become apparent from the following description when taken with FIGURE 1 of the drawings wherein the cables **14**, base plug **16** are shown already disposed in the well shaft **12**. Several units **10** have been lowered into the shaft **12**, the first unit **10** is seated on the base plug **16** and each succeeding unit **10** seats atop the previously lowered unit **10**.

The units are lowered by any suitable mobile hoist means such as tractor mounted hoist **44** shown. A lift cable **46** of the hoist has a grab (not shown) secured on the end thereof which engages the interior of the unit **10**. The unit is lifted from the ground, as shown, at which time the operator may insert the connectors **32** through the slots **24** from the inner end thereof and arrange the hook end **34** horizontally.

The open hook ends **34** are faced in the same direction and the unit **10** is moved into a position disposed between the cables **14** whereby each of the hook ends **34** of the connectors **32** may be engaged with the respective cables **14**.

The hook ends **34** being of bendable material are closed about the cables **14** by the operator whereupon the unit **10** may be lowered into position. The connectors slidably secure the unit to the cables **14** whereby the cables **14** guide the downward travel of the unit assuring proper alignment and seating of the unit with the previously lowered units.

From the foregoing description, it is thought to be obvious that a method and means for installing concrete wall casings constructed in accordance with my invention is particularly well adapted for use, by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof, and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice, except as claimed.

I claim:

1. A well casing assembly comprising a pair of vertically disposed cables in diametrically opposed positions in a well, means for anchoring the cables in the bottom of the well, means for anchoring upper ends of the cables at the top of the well and at points aligned with the points where the lower ends are anchored in the bottom of the well, a plurality of vertically disposed tubular cylinders having inner and outer surfaces and having continuous longitudinally disposed and diametrically opposite grooves in the outer surfaces of the well casing and positioned between the cables, and vertically spaced and vertically aligned eyes mounted in the cylinders and positioned in the grooves, the eyes being spaced inwardly from the ends of the cylinders and the cables being disposed through the eyes and positioned in the grooves whereby the cables are not subject to being pinched or broken by the cylinders rubbing against the well wall.

2. A well casing assembly comprising a pair of vertically disposed cables in diametrically opposed positions in a well, means for anchoring the cables in the bottom of the well, means for anchoring upper ends of the cables at the top of the well and at points aligned with the points where the lower ends are anchored in the bottom of the well, a plurality of vertically disposed tubular cylinders having diametrically opposed longitudinally disposed grooves in outer surfaces thereof and extended throughout the length of the cylinders, and vertically spaced and vertically aligned eyes positioned in the grooves and spaced inwardly from ends of the cylinders, said eyes having shanks extended through walls of the cylinders

and having heads on their inner ends positioned in openings extended from the grooves to the inner surfaces of the cylinders, the heads of the shanks being nested in enlarged recesses in inner surfaces of the walls of the cylinders and extended around the inner ends of the openings extended from the grooves in the outer surfaces thereof, the cables being disposed through the eyes and nested in the grooves whereby the cables are protected and not subject to be pinched or broken by the cylinders rubbing against the well wall.

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