Oct. 11, 1960 J. A. SINCLAIR 2,955,341

CASTING HOLLOW RECEPTACLES

Filed April 5, 1957

2 Sheets-Sheet 1

FIG. 1.

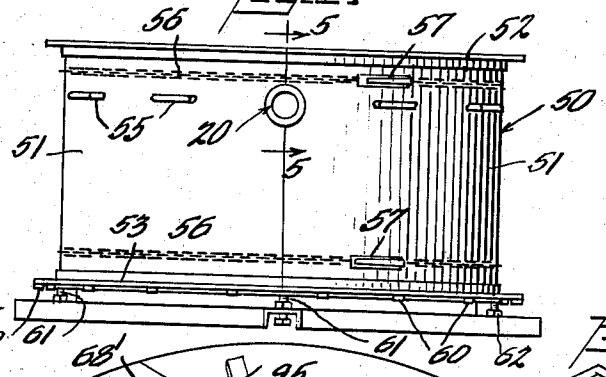


FIG. 2.

FIG. 2A.

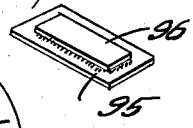


FIG. 3.

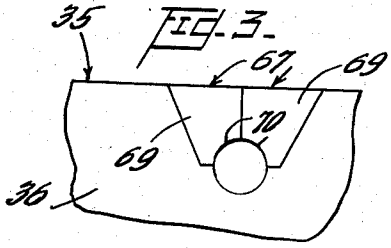


FIG. 4.

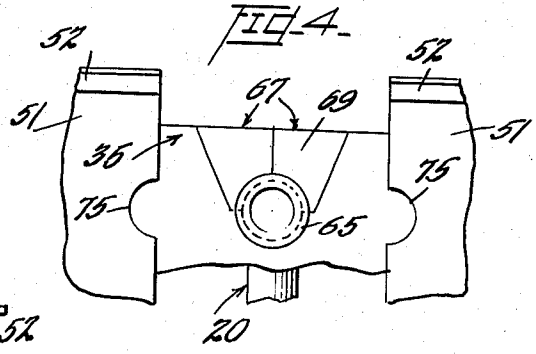
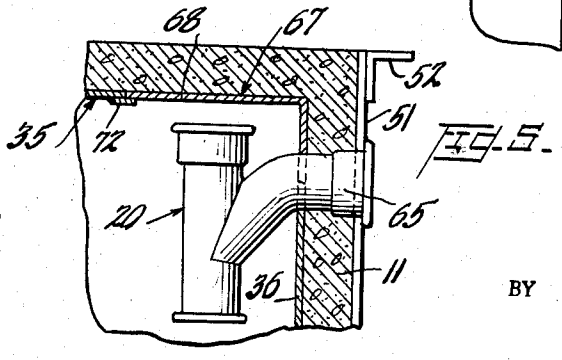


FIG. 5.



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FIG. 6.

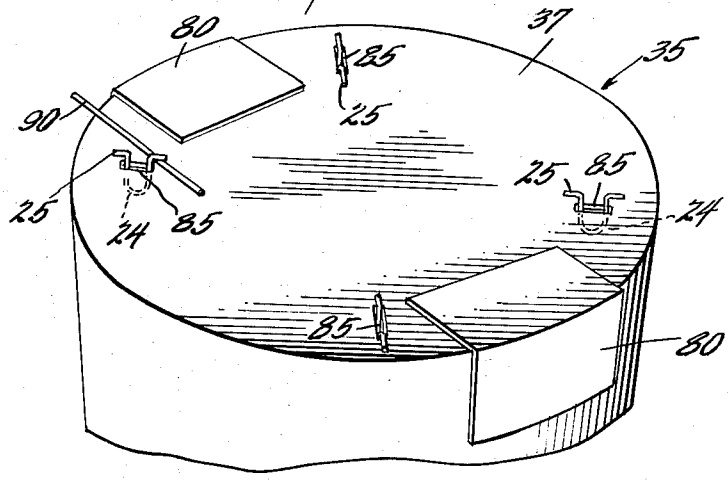


FIG. 7.

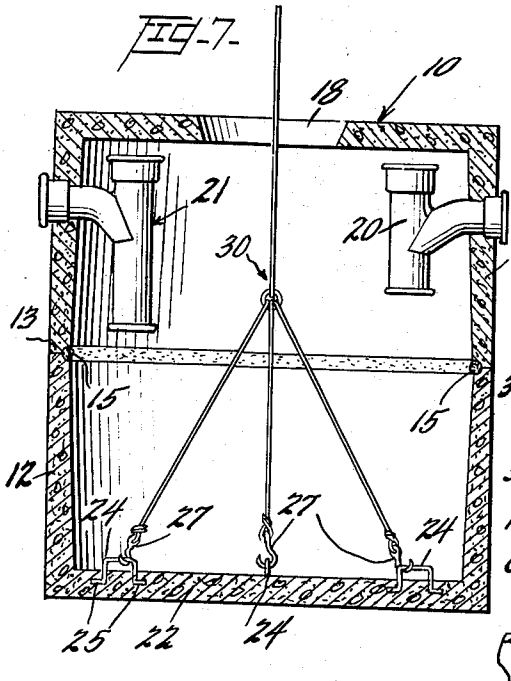


FIG. 8.

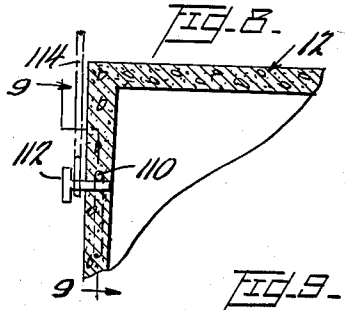


FIG. 9.

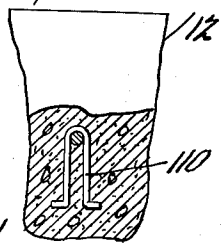
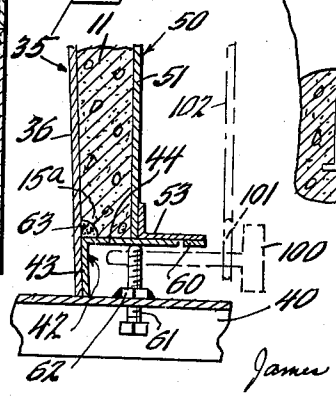


FIG. 10.



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CASTING HOLLOW RECEPTACLES

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Filed Apr. 5, 1957, Ser. No. 650,982

2 Claims. (Cl. 25—130)

This invention relates to apparatus involved in the molding or casting of concrete structures such as, for example, septic tanks.

The present invention is an ingenious development of that disclosed in my copending application Ser. No. 559,600, filed January 17, 1956, now Patent No. 2,894,311, and contributes to this basic conception certain novel and improved features facilitating greatly the process of casting hollow concrete bodies such as the septic tanks mentioned, with an attendant saving in labor, time, and costs.

Further objects of the invention include the provision of novel means concerned with the arrangement and manipulation of the mold parts; improved devices for the attachment or installation of special parts concerned in septic tank construction.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawings in which certain embodiments of the invention are illustrated by way of example.

In the drawings:

Figure 1 is a view in side elevation of a molding or casting apparatus in finally assembled form;

Figure 2 is a fragmentary view in perspective of the upper portion of an inner mold member which forms the core of the hollow casting about which the concrete is poured when the outer mold element is applied;

Figure 2A is a detail view in perspective of a closure plate employed in connection with the inner mold when certain types of hollow casting are to be formed;

Figure 3 is a fragmentary detail showing the arrangement in the side wall of the inner mold element for the accommodation of conduits;

Figure 4 is a similar view showing the conduit section installed in the inner mold and certain parts of the outer mold being moved into place;

Figure 5 is a fragmentary vertical sectional view taken substantially on line 5—5 of Figure 1;

Figure 6 is a view similar to Figure 2 showing the inner mold part equipped for casting an alternative section of a septic tank;

Figure 7 is a view in vertical section of a completely cast and assembled septic tank indicating one way of hoisting the article for transport;

Figure 8 is a fragmentary sectional view taken through an upper corner of a casting comprising a bottom section of the septic tank, prior to inversion;

Figure 9 is a fragmentary sectional view taken on line 9—9 of Figure 8; and

Figure 10 is a vertical detail sectional view through the lower edge of the apparatus illustrating several features of the invention including forming, separating, and lifting of the parts.

Referring briefly to Figure 7 of the drawings for an initial description of one of the products which may be formed according to the principles of the present invention, it will be seen that the septic tank **10** is a barrel-

shaped receptacle comprising an upper substantially half-section **11** and a lower half-section **12**, these sections being joined along the abutting edges **13** and sealed together by the grouting which fills the internal peripheral groove **15**. Although the tank **10** is shown as of circular horizontal section, it may have a polygonal section within the scope of the broad claims.

It will be noted that the upper and lower sections **11** and **12** are substantially identical in general configuration, the outer peripheral surfaces being substantially cylindrical and the inner surfaces being frusto-conical, the degree of taper being very slight. The upper section **11** has a central axial opening **18** therein which may be closed by any sort of cover plate whether metallic or of concrete. The upper section is equipped with T-fittings, an inlet fitting being indicated generally by the reference numeral **20** and an outlet fitting designated **21**.

The inside of the bottom wall **22** of the bottom section **12** is provided with U-shaped clips **24** having arms or projections **25** at their ends embedded in the material of which the bottom plate **22** is made, these clips being provided for engagement by the hooks **27** forming parts of the grappling means **30**.

According to the principles of the invention, the upper sections **11** and the lower sections **12** may be cast by the same basic apparatus with certain novel modifications which are easily applied thereto. Also, for varying the capacity of the tanks as a whole, the upper and lower sections **11** and **12** may be made of slightly different heights and therefore of slightly different capacities. The heights of these sections may be varied by employing the elevated annular pallets described in my copending application.

Now referring more particularly to Figures 2–5 of the drawings, the construction and adaptation of the inner mold form and the application thereto of the outer mold section will be described. The inner mold, preferably made of metal, is designated generally by the reference numeral **35** and comprises a somewhat frusto-conical side wall **36** and a flat substantially circular top wall **37**. Preferably the inverted tub-like inner mold section has its rim resting on a framework **40**, as indicated in Figure 1, which may consist of crossed inverted channels similar to those shown in the above mentioned copending application. An enlarged detail view illustrating the way in which the channel **40** supports the inner mold section **45** constitutes Figure 10 of the drawings.

Closely surrounding the lower rim of the inner mold section **35** at the base thereof is an annular pallet **42** which is of angular cross-section having a substantially vertical flange **43** and a horizontal flange **44** upon which the outer mold section and the casting itself rests.

Before describing the detail construction of the inner mold section, so far as its adaptability for the reception of the conduit fittings is concerned, the construction and application of the outer mold form will be presented. The outer mold section indicated generally by the reference numeral **50** comprises a pair of semi-cylindrical parts **51** each having a flanged upper and lower margin formed of the semi-circular angle pieces **52** and **53**. As clearly shown in Figures 1 and 10 the lower rim of the outer form **50** including the angle iron **53** rests upon the outer portion of the horizontal flange **44** of the pallet ring **42**.

The sections **51** of the outer mold form **50** are brought together about the already positioned inner mold section **35** as indicated in Figure 4 and when finally in position where their opposite edges abut, the installation appears as shown in Figure 1 of the drawings. In order to readily manipulate the outer mold sections **51** they are provided with the hand grips **55**, and in order to bind the outer form together, cables or chains **56** are employed

having adjustable tension devices 57 therein very similar to load binders used in the construction and transport fields.

In order that the outer mold 50 may be properly positioned with respect to the inner mold so as to provide an inner casting space of uniform thickness, stop cleats 60 are welded at intervals around the underside of the outer edge of the lower flange 53 of the outer mold, these cleats being adapted to abut the outer periphery of the pallet plate 44 and thus gauge the positioning of the mold parts.

As previously indicated, the outer mold 50 is substantially cylindrical having vertical walls, while the inner mold is slightly frusto-conical thus giving a slightly thicker wall of the cast article at the top than at the bottom.

Means for forcing the pallet and the outer mold upwardly in order to separate the cast product from the supporting frame are provided similar to those shown in my above mentioned copending application. This comprises the set screw or bolt 61 which is threaded through a nut 62 welded to one of the base frames 40, whereby turning the bolt 61 applies pressure to the underside of the pallet ring 42 and thus forces a separation of the pallet from the supporting framing.

In practicing the invention, it will be readily understood that when an upper section is removed from the mold, the inlet and outlet fittings will of course rise with the concrete casting and obviously the split closure 67 also will be carried upwardly with the casting. This of course permits the fittings in their entirety to readily rise out of the inner mold part 35. Then when the casting is removed the closure plate 67 can be easily disengaged from the casting.

At this point, a feature of novelty relating to the provision of the grouting groove 15 may be described. An endless ring of preferably flexible rope or cable 63 is placed around the lower portion of the inner mold 35 and rests upon the inner edge of the horizontal flange 44 of the annular pallet 42, as shown in Figure 10 of the drawings. When the casting is removed, this strand leaves a segmental groove portion 15A which mates with a similar grove in the opposite section to provide the substantially semi-circular grouting groove 15.

Referring now to Figures 2, 3 and 4 of the drawings, the modifications of the inner mold part 35 in order to provide for the installation of the inlet and outlet conduit fittings will be described. At diametrically opposite sides of the upper portion of the inner mold 35, openings are cut in both the side wall portion 36 and the top wall 37, that portion of the opening which occurs in the top wall being approximately rectangular and the one cut in the upper edge of the side wall 36 being downwardly tapered and provided with a semi-circular lower central indentation 64. This arcuate indentation is adapted to receive the laterally extending nipple portion 65 of one of the fittings, for example, inlet fitting 20. A pair of symmetrical flanged pieces 67 are provided which have horizontal plate-like portions 68 and tapered curved side portions 69 which have arcuate cut-away parts 70, which, together with the depressed semi-circular cut 64 in the side wall 36, provide a circular opening into which the neck of the nipple 65 fits. This interfitting of the parts is clearly shown in Figures 2 and 4 of the drawings. Of course, the lower edges of the side flanges 69 of the insert pieces 67 rest upon the corresponding cut-away portions on the side wall 36 and a narrow ledge plate 72 is welded to the underside of the top plate 37 of the inner mold in order to support the horizontal plate portions 68 of the inserts 67.

A substantially similar arrangement is provided at the opposite side of the inner mold 35 as shown in Figure 2 and these parts are given the same numbers primed. As suggested in Figure 7 of the drawings, the outlet fitting 21 may be of slightly different dimensions and may be dropped an inch or two lower than the corresponding inlet fitting 20, and these differences are merely dimensional and will require only a slight change in the sizing of the inserts 67 and the openings cut in the inner mold. Of course, the outer mold sections 51 must be provided with semi-circular notches 75 (as shown in Figure 4) in order to embrace the bell of the nipple 65. The entire assembled mold forms adjacent the conduit fitting installations are clearly shown in Figure 5 of the drawings where the concrete has already been poured and constitutes a portion of the upper septic tank section 11.

Now in order to employ the same inner mold form 35 for the casting of the lower sections 12, provision is made for blocking the inlet and outlet fitting openings and this expedient is clearly shown in Figure 6 of the drawings where the sheet metal cover plates 80 are placed over the entire openings to which the inserts 67 were applied when the upper section 11 is being cast. One of these cover plates 80 is suggested in broken lines in Figure 2 of the drawings where it will be readily seen how the fitting openings are completely covered for casting a bottom section.

However, there are some slight further modifications to be applied when a bottom section 12 is to be cast. Referring to both Figures 2 and 6 of the drawings, it will be seen that there are provided at intervals around the top plate 37 of the inner mold 35 the narrow slots 85. Four of these slots are shown for symmetrical illustration, but it will be understood as the description proceeds that there may be three or more of these slots. Into these slots 85 are inserted the clips 24 with the oppositely extending arms 25 projecting laterally at each end of the slots. In casting the concrete, reinforcing mesh of any suitable kind may of course be applied around the inner form 35 and enclosed within the outer form 50 when it is installed, and this reinforcing mesh is suggested at 90 in Figure 6. The projecting arms 25 of the clips 24 may be positioned outwardly of the upper surface of the plate 37 of the inner mold by resting upon certain of these reinforcing elements. Thus the arms 25 and other outwardly projecting portions of the clips 24 will be in position to be embedded in the flat surface of the bottom section 12 when it is cast. Of course, the looped portions of the clips 24 will project inwardly of the inner form 35 and thus be in a position to project as shown in Figure 7 for attachment of the grappling hooks.

Now when upper sections 11 are being cast there is no need for the embedment of clips 24, so the slots 85 are plugged by the small plates 95 as suggested in Figure 2. These plates are shown in Figure 2A and comprise a larger plate having a smaller extension 96 welded thereto, the part 96 being of exactly the size of the slots 85 and adapted to fit therein.

Thus it will be readily seen that when casting the upper sections the plugs 95 are employed to block the openings 85, and when cast in the lower sections the cover plates 80 are employed to close the openings into which the fittings 20 and 21 are ordinarily disposed.

The manhole opening 18 may be found by the positioning of a core member 118 upon the top surface 37 of the inner mold section 35 as suggested in Figure 2, and then knocking it out when the casting is removed.

Means for lifting the pallets with their supported sections 11 or 12 are suggested in Figure 10 of the drawings as comprising a headed pin 100 which may be passed through an eye 101 in a depending bracket 102 which latter may form a part of a spreader bar lift arrangement. The pin 100 is slipped through the eye 101 and beneath the pallet 144 and when the spreader bar is lifted, the entire casting may be raised and transported to an appropriate point for assembly with a bottom section 12.

These bottom sections 12 when they are cast must, however, be inverted in order to assemble the septic tank properly as indicated in Figure 7. For this purpose these may be cast in diametrically opposite sides of the wall of the section 12 a U-shaped loop element 110 and

a headed pin suggested at **112** in Figure 8 may be inserted through an appropriate opening in the outer form **50** and then into the casting area within the bight of the loop **110** and then when the bottom section is poured and cast, the pin **112** may be utilized as a point of connection for suitable lifting or grappling tackle **114** suggested in Figure 8, and about which the section may be swung to invert it. After the assembly is accomplished, of course, the pin **112** may be removed and the small opening filled with cementitious material.

It will be understood that various changes and modifications may be made in the embodiment illustrated and described herein without departing from the scope of the invention as defined by the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A mold apparatus for casting a hollow generally cylindrical concrete receptacle having a pipe fitting extending through the side wall thereof, said fitting having a part projecting inwardly of the receptacle, said apparatus comprising a supporting base, an inner mold part comprising an inverted tub-shaped member resting on said base and having an approximately cylindrical side wall and a flat top wall, said walls intersecting to form a peripheral corner edge; and an outer approximately cylindrical mold part enveloping and spaced outwardly from said inner mold part to provide a casting space in between, a part of said top wall being cut away inwardly from the peripheral corner edge of said mold part where the two walls join, on one side thereof, and an adjacent portion of the side wall being cut away downwardly from said edge, the cutaway portion of said walls providing an opening consisting of two adjoining areas, one area interrupting the marginal portion of the top wall above the contemplated position of the inwardly projecting portion of the pipe fitting and being of a size and configuration to accommodate the upward withdrawal of said inwardly projecting portion of the fitting upon completion of the casting operation, and the other area interrupting the adjacent upper marginal portion of the side wall of said inner mold part to accommodate the portion of the fitting which extends laterally through said side wall and the wall of the casting, a temporary closure applied to said opening and being of angular configuration so as to extend over both areas of said opening and formed to embrace said laterally extending portion of the pipe fitting, means for loosely supporting said closure in position on the inner mold part so that it may be upwardly withdrawn along with the casting and its pipe fittings when the casting operation is completed.

2. The mold apparatus as set forth in claim 1 wherein said closure is in the form of a split plate, the two parts of which are angular in section, horizontal portions of which parts together cover the first mentioned area of the opening in the top wall of the inner mold part, and depending parts of said split plate together covering the second area of the opening in the side wall of the inner mold part, the adjacent edges of the two depending parts of the plate being provided with complementary recesses whereby they are adapted to fit closely around the inwardly projecting part of the pipe fitting.

References Cited in the file of this patent

UNITED STATES PATENTS

862,123	Adams	Aug. 6, 1907
1,050,816	Deslauriers et al.	Jan. 21, 1913
1,948,931	Mears	Feb. 27, 1934
1,983,757	Hick	Dec. 11, 1934
2,068,302	Nickol	Jan. 19, 1937
2,086,154	Boggs	July 6, 1937
2,485,850	Sitton	Oct. 25, 1949
2,510,810	Furst	June 6, 1950
2,539,741	Hayes	Jan. 20, 1951
2,749,303	Sitton	June 5, 1956
2,828,526	Blasius et al.	Apr. 1, 1958
2,831,231	Toensing	Apr. 22, 1958