Dec. 30, 1952 E. J. SCHUH, SR 2,623,259

INNER FORM FOR CONCRETE TANK MOLDS

Filed July 25, 1949 3 Sheets-Sheet 1

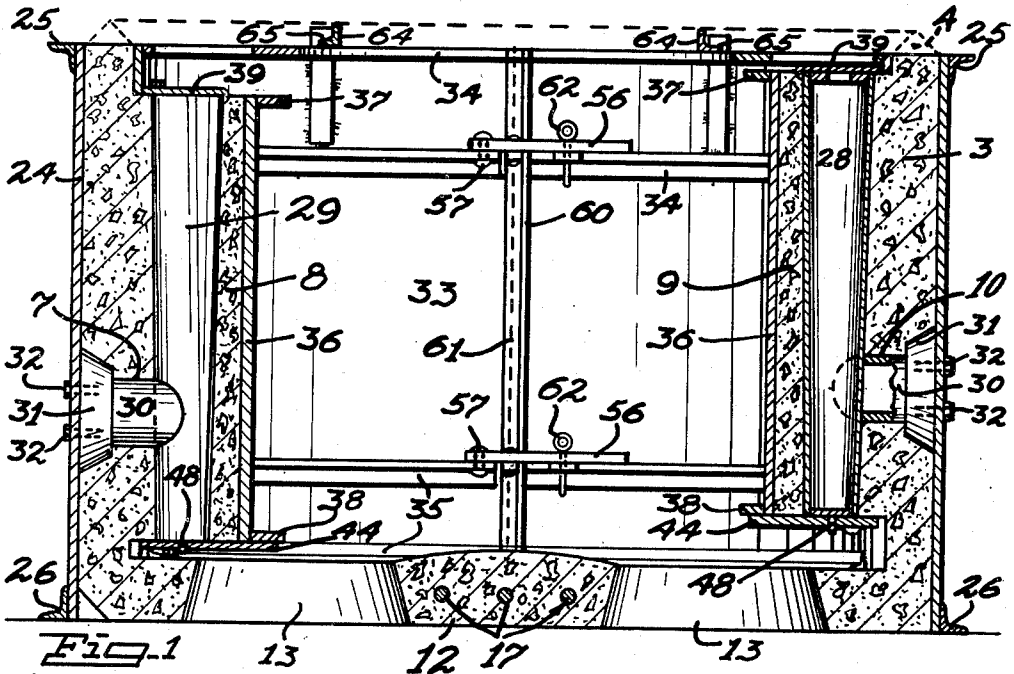


Fig-1

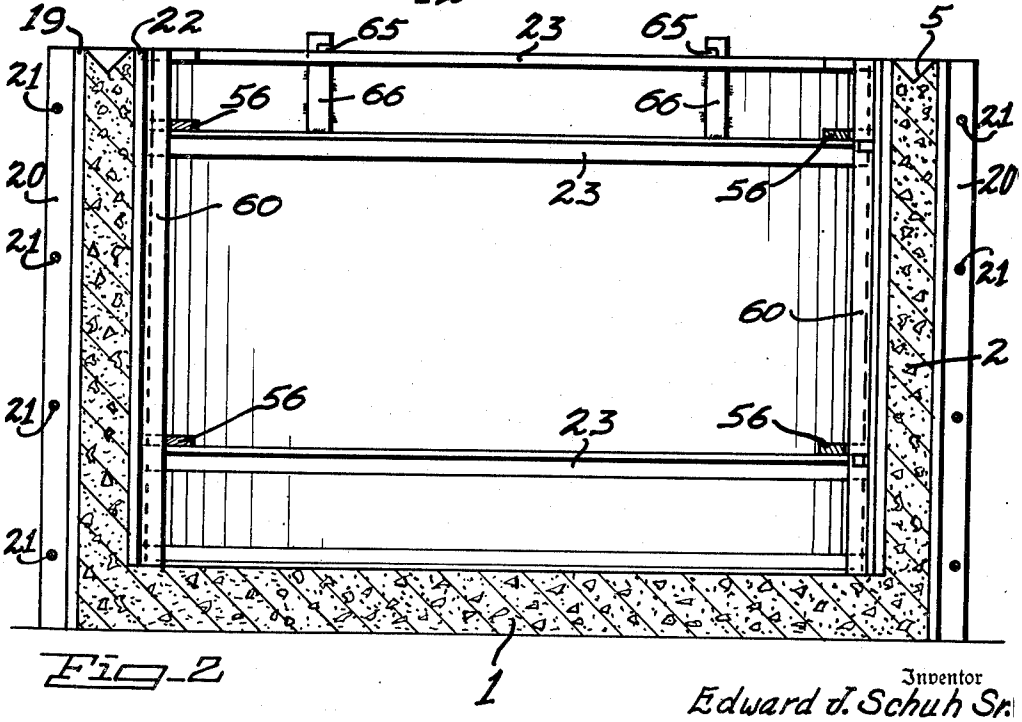


Fig-2

Inventor
Edward J. Schuh Sr.

By Glenn L. Fish
Attorney

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INNER FORM FOR CONCRETE TANK MOLDS

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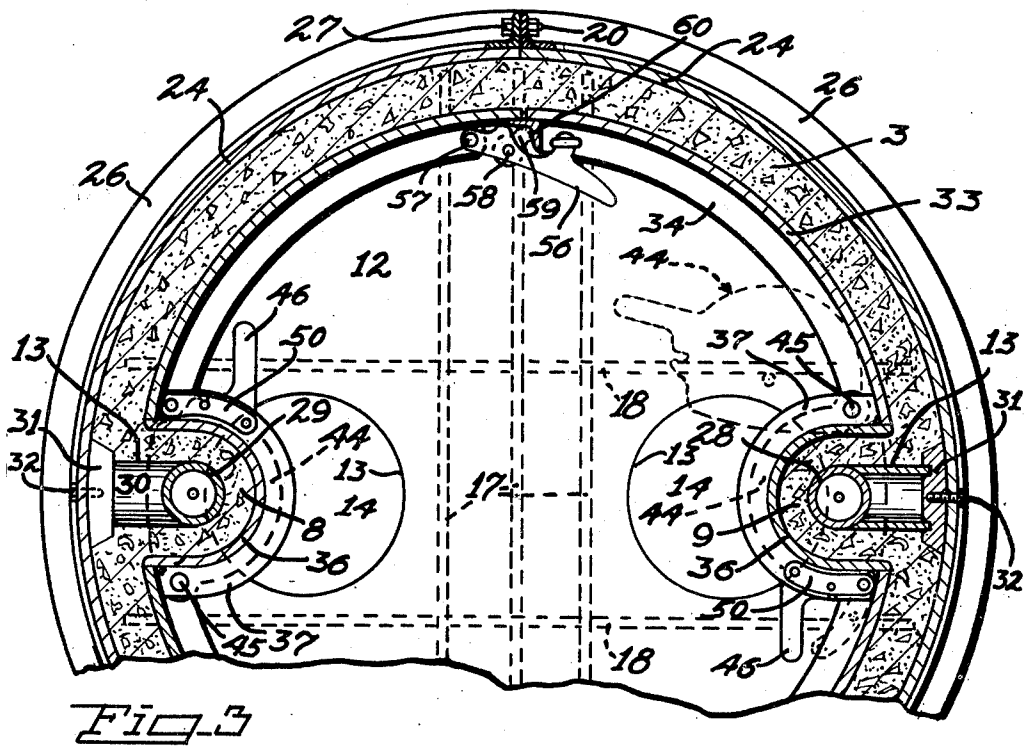


Fig. 3

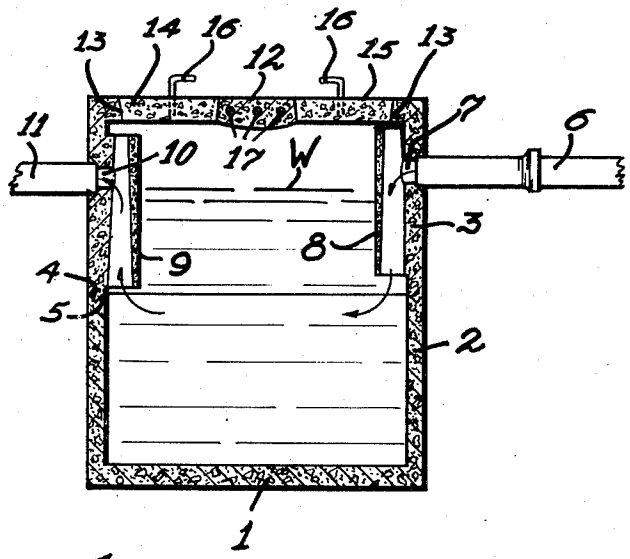


Fig. 4

Inventor
Edward J. Schuh Sr.

By Glenn L. Fish
Attorney

Dec. 30, 1952 E. J. SCHUH, SR 2,623,259

INNER FORM FOR CONCRETE TANK MOLDS

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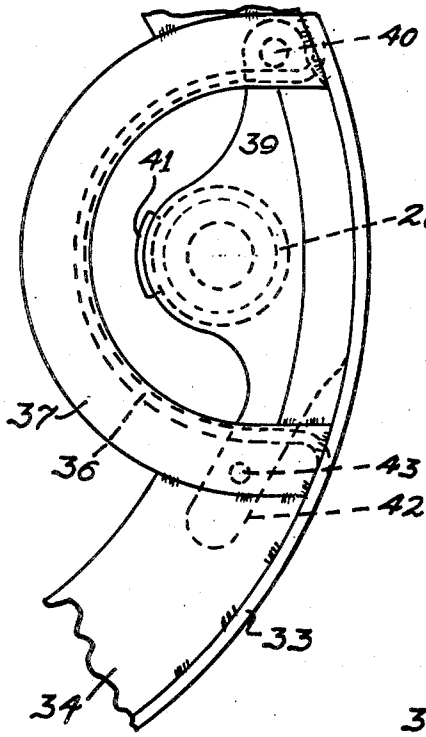


Fig. 5

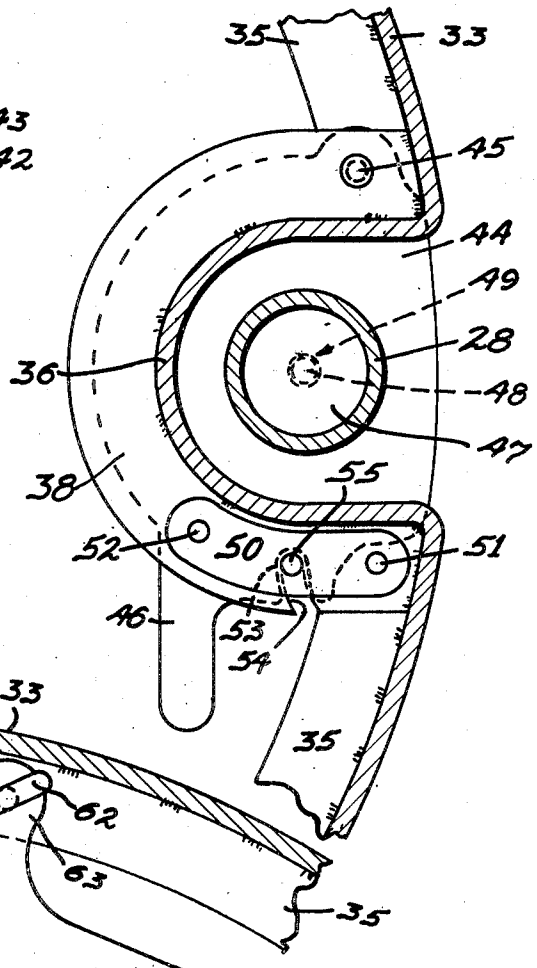


Fig. 6

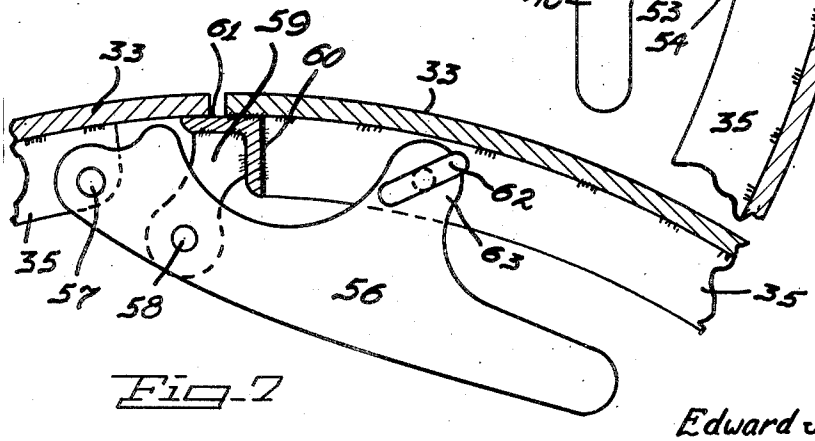


Fig. 7

Inventor
Edward J. Schuh Sr.

By
Glenn L. Fish
Attorney

Patented Dec. 30, 1952

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# UNITED STATES PATENT OFFICE

2,623,259

## INNER FORM FOR CONCRETE TANK MOLDS

Edward J. Schuh, Sr., Dishman, Wash.

Application July 25, 1949, Serial No. 106,600

4 Claims. (Cl. 25—124)

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The present invention relates to the general class of liquid separation and sewage disposal and purification including settling and septic tanks or cisterns, and more specifically to improvements in portable and separable concrete mold forms and cores for pouring or casting non-metallic plastic materials, and adapted for stationary use. By means of the novel forms and cores of the mold a closed hollow concrete or masonry structure, in the shape of a cylindrical tank, may be constructed with a separately poured bottom section and a separately cast top section, the latter while in inverted position; and when the material is set, by means of a derrick or crane the completed sections may be successively placed in position for use, preferably in a prepared pit, or underground.

The molds of sheet metal are composed of inner and outer sectional shells that are equipped with quick-detachable fastening members, and they include a minimum number of parts that may be manufactured with facility and low cost of production, and the parts may be assembled with convenience to assure an efficient mold that may be operated with a minimum expenditure of time and labor.

The invention consists in certain novel features of construction and combinations and arrangements of parts as will hereinafter be described and more particularly pointed out in the appended claims.

In the accompanying drawings I have illustrated a complete example of a physical embodiment of my invention, in which the parts are combined and arranged in accord with one mode I have devised for the practical application of the principles of the invention. It will however be understood that changes and alterations are contemplated and may be made in these exemplifying drawings and mechanical structures, within the scope of my claims, without departing from the principles of the invention.

Figure 1 is a transverse vertical sectional view through the mold for the upper or top section, showing the tank formation in inverted position.

Figure 2 is a vertical sectional view of the mold for the lower or bottom section of the tank.

Figure 3 is a horizontal sectional view through the structure of Fig. 1.

Figure 4 is a vertical sectional view, on a smaller scale, of the completed septic tank.

Figure 5 is an enlarged detail plan view of the upper removable closure of a core used in the formation of the inlet and the outlet of the tank.

Figure 6 is a similar view of the lower removable closure of the core for the inlet and outlet formations of the tank; and

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Figure 7 is a detail plan view of one of the quick detachable fasteners or lever locks of an inner cylindrical shell or form of a mold.

In order that the general relation and utility of parts may readily be understood I have disclosed in Fig. 4 a complete septic tank constructed according to my invention with a base section including the bottom 1 and the cylindrical wall 2, which may be located in a pit or hole, together with the upper section having a cylindrical wall 3. After the two sections have hardened and been released from the molds the upper section is placed upon the lower section and the adjoining edges are cemented together by means of an annular rib 4 and a complementary groove 5.

An inlet drain pipe or sewage pipe 6 communicates with the intake port 7 of the upper section, and an upright baffle wall 8 forms an integral tubular inlet spout or chamber for the sewage. At the opposite side of the section 3 an integral tubular wall 9 forms an outlet chamber or nozzle having a liquid outlet port 10 to the discharge pipe line 11 for disposal of the separated liquid. The walls of the intake and the outlet flare outwardly and downwardly to prevent solids from clogging and obstructing these passages and the upper and lower ends of the inlet and outlet chambers are open above and below the liquid level or water level W respectively.

The integral flat top of the tank designated at 12 is formed with a pair of spaced circular holes, or man-holes 13, 13 that are closed by removable covers 14 and 15, each equipped with an angular metallic bar 16 forming a handle. The covered man-holes are located directly above the inlet spout and the outlet nozzle, in order to provide access to these parts for clean-out purposes.

The flat top of the tank is reinforced by the use of embedded sets of metallic bars or rods as 17, three of which are laterally spaced and parallel, together with a pair of parallel cross bars or rods as 18.

As seen in Fig. 2 the monolithic cylindrical base section 1–2 is cast or poured within an outer sectional and separable cylindrical sheet metal form or shell 19 having upright perforated attaching flanges 20 that are fastened by clamp bolts 21 passed through holes 21 and secured by clamp nuts. The complementary inner sheet metal shell or core 22 of the base section is spaced within the outer shell or form and is

braced by interior rings 23 of angle iron segments and the adjoining upright ends of the sections of the inner shell are interlocked as will be detailed in the description of similar lever-locks or quick detachable fastenings for the sections of the inner shell of the mold for the upper section of the tank.

To facilitate pouring of the concrete material for the upper half of the tank, this upper section of the tank is poured in inverted position with the flat top 12 at the bottom of the mold and resting upon a suitable bed or foundation.

As best seen in Figs. 1 and 3 the outer sectional cylindrical shell or mold constsis of two semi-cylindrical parts as 24, each reinforced by an upper segmental angle iron ring 25 and a similar lower ring 26, and the separable sections of the mold at their adjoining ends are equipped with upright angle strips 20 having registering holes for the clamp bolts 27 that are secured by clamp nuts as usual.

In order to form the two man-holes 13 in the top 12 of the inverted upper half of the tank, suitable cores are set on the foundation of the form; and for shaping the tapered inlet and outlet barriers of the tank two diametrically arranged and detachable cores are mounted within the outer shell or sectional form 24.

Each of these cores includes an inset and upright tapered pipe, as 28 and 29, and a short horizontal and tubular nipple 30 that terminates in an enlarged frusto-conical or flaring head 31 that is mounted against the inner face of the outer shell and secured thereto by means of screw bolts 32.

The upper and lower ends of the tapered tubular cores 28 and 29 are closed by means of manually removable gates hinged on the inner sectional shell or core 33, which shell is made up of two semi-cylindrical segmental rings or upright sections, each of which sections has an inner upper band or horizontal flange 34 and a complementary flange 35 at its lower end, which are secured to the sections by welding.

Each section 33 of the inner shell is shaped with an inset bulge or tapered wall, as 36, and this core-wall has attached thereto an upper semicircular and horizontal flange 37 and a complementary lower flange 38, welded to the core wall and the body of the semi-circular or semi-cylindrical section. For closing the upper ends of the tapered tubular cores each core is provided with a flat horizontal plate or gate 39, hinged at 40 on flange 37, and the gate is provided with a depending lip or lug 41 to act as a stop against the core. The handle 42 of the gate is drilled to form a hole that registers with a complementary hole in the flange 37, and a removable locking pin 43 is passed through these holes to retain the upper gate in closed position.

For closing the bottoms or lower ends of each of the upright tapered tubular cores 28—29, a flat horizontal gate 44 of substantially semi-circular shape is hinged at 45 on the under side of a lower flange adjacent each core and provided with a handle 46. The core is provided with an inner bottom-disk 47 having a centering pin 48 that fits into a hole or socket 49 of the gate, and a locking link or latch 50 at one end is pivoted at 51 to the flange 38, while its other free end is drilled to form a hole for a removable retaining bolt 52 that fits into a registering socket in the flange 38. For retaining the latch in locked position the gate is slotted at 53 and the flange is slotted at 54 to accommodate a retaining stud 55 that locks the gate to the flange.

In assembling the parts for the molds, the adjoining upright edges of the sections of the inner shell 22 of the base, as well as the adjoining upright edges or ends of the sections of the inner shell 33 of the inverted top mold, are each fastened together in pairs by quick detachable and manually operated locking means, one of which is best illustrated in Fig. 7. These lever locks are mounted upon the vertically spaced interior segmental rings or flanges 34 and 35 of the respective shells, and each includes a lever 56 that is hinged at 57 on one end of a segment as 35 and fulcrumed at 58 on a horizontal ear or lug 59 rigid with an end of another adjoining ring-segment.

The lug or fulcrum ear is welded to an upright angle iron strip 60, which, in turn is welded to the edge of the shell-section that supports the second ring-segment, and manual power is applied to the lever to draw together the adjoining edges of the shell-sections. A gap between the two adjoining edges of the sections is closed by the flange 61 of the angle strip, and then a retaining eye-bolt 62 is inserted into registering holes or sockets in the flange 35, and a lug 63 of the lever.

When the inner and outer shells of the molds for the upper and lower sections of the tank are assembled, the inner shells are leveled and held flush with the tops of the outer shells by means of a pair of spaced parallel angle strips as 64 that are frictionally fitted in notches 65 of straps 66 that are welded against the inner face of the inner shell, as best seen in Figs. 1 and 2.

In erecting the molds, the lower ends of the inner shells terminate at a distance above the lower ends of the outer shells, and the inner shells are supported in this elevated position by means of the hooked straps 66 and the leveling cross bars 64, and as the shells rest upon a foundation bed the horizontal top and bottom walls of the two tank sections are poured within the inner shell. These circular flat bottom walls project outwardly to the inner surfaces of the outer shells, and the integral upright cylindrical walls of the tank sections are poured within the annular space between the concentric shells.

After the plastic concrete has set, the locked parts of the mold are released and separated; the detachable nipples with their heads or plugs are released as the bolts 32 are withdrawn, and these parts are removed from the tapered tubular cores; the gates are opened; and the separated parts may be manipulated by means of a derrick and hoist line, to free the concrete sections of the tank.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An inner shell for a concrete mold comprising vertically disposed separable sections, portions of said sections being bowed inwardly and forming pockets, extending inwardly of the shell and open along their outer sides, tubes extending vertically in the pockets and spaced from the inwardly bowed portions and tapered towards their lower ends, nipples extending outwardly from and radially of the mold and having their inner ends engaging the tubes and their outer ends enlarged and forming heads adapted to be detachably secured to an outer shell, and closures movable into and out of clos-

ing relation to upper and lower ends of said tubes.

2. The structure of claim 1 wherein the inwardly bowed portions are each provided about their upper and lower ends with outstanding flanges, the closures for the lower ends of said tubes also constituting closures for lower ends of the pockets and each consisting of a plate pivoted at one side edge to a portion of the lower flange at one side of the pocket, a handle extending from the other side edge portion of said plate, a link pivoted at one end to the said lower flange at its other end being detachably secured to the flange, the flange and the plate being formed with slots registering when the plate is in the closed position, and a lug carried by said link and passing through the registering slots.

3. The structure of claim 1 wherein the closures for upper and lower ends of the tubes consist of plates pivotally mounted for movement into and out of a closed position, the said plates carrying disks fitting into ends of the tubes and centering the tubes in the pockets formed by the offset portions of the shell, and the lower plates also constituting closures for lower ends of spaces about the tubes, and fasteners releasably securing the plates in a closed position.

4. The structure of claim 1 wherein the meeting side edges of adjoining shell-sections are bridged by a vertically extending bar, strips mounted horizontally along the said shell-sections, a lug extending from said bar, a latch pivoted intermediate its length to said lug and having one end pivoted to one strip and its other end portion constituting a handle extending across said bar and formed with a finger overlapping the second strip, and a securing pin passed through the finger and the second strip and releasably securing the latch stationary with the shell-section in tight fitting engagement with the bar.



EDWARD J. SCHUH, SR.

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