Dec. 22, 1953 E. H. LATHAM, JR 2,663,064

APPARATUS FOR CONSTRUCTING SEA WALLS

Filed Aug. 18, 1952 3 Sheets-Sheet 1

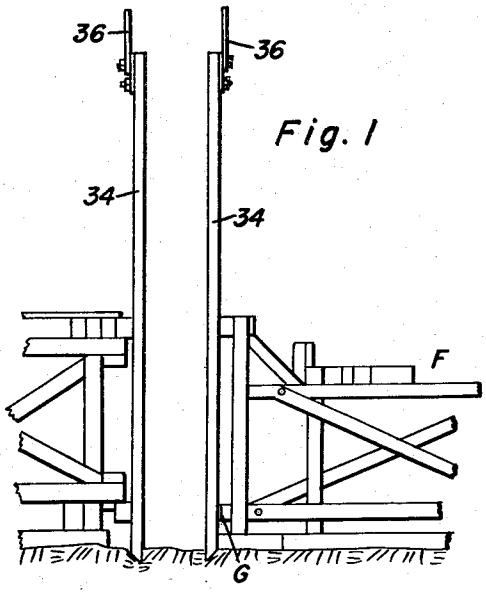


Fig. 1

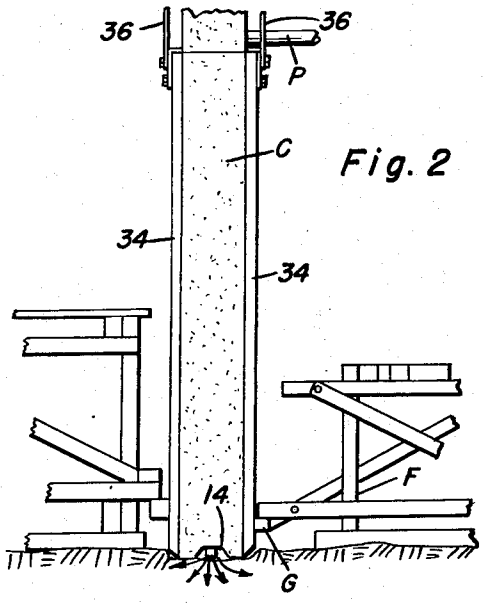


Fig. 2

Fig. 3

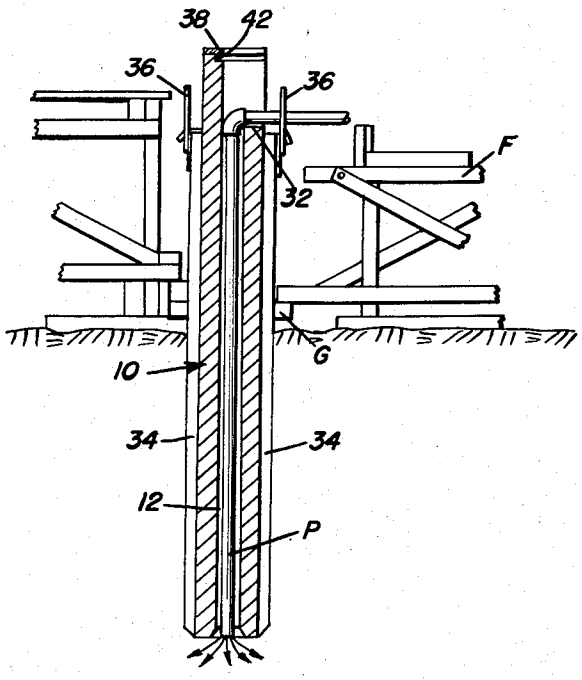
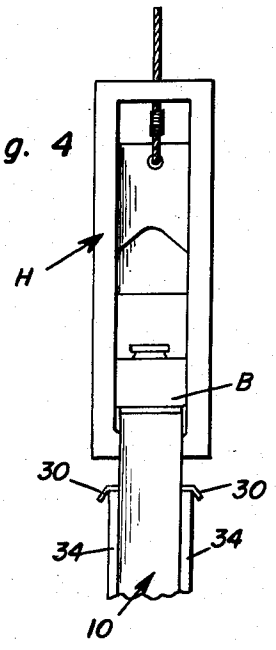


Fig. 4



Edgar H. Latham, Jr.
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

Dec. 22, 1953 E. H. LATHAM, JR 2,663,064

APPARATUS FOR CONSTRUCTING SEA WALLS

Filed Aug. 18, 1952 3 Sheets-Sheet 2

Fig. 5

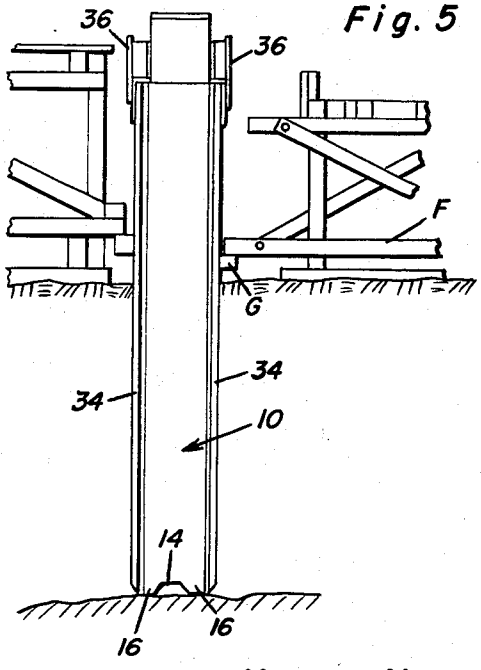


Fig. 7

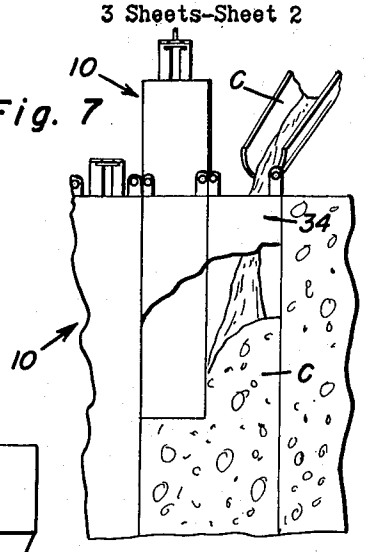


Fig. 6

Edgar H. Latham, Jr.
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

Dec. 22, 1953 E. H. LATHAM, JR 2,663,064

APPARATUS FOR CONSTRUCTING SEA WALLS

Filed Aug. 18, 1952 3 Sheets-Sheet 3

Fig. 8

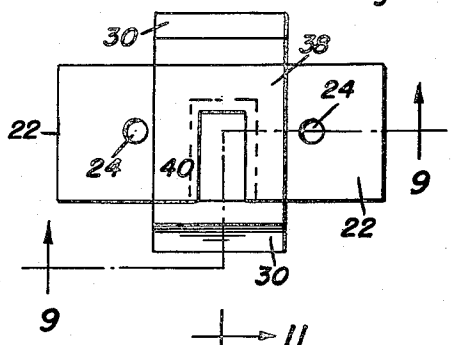
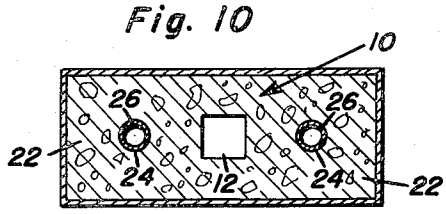


Fig. 10



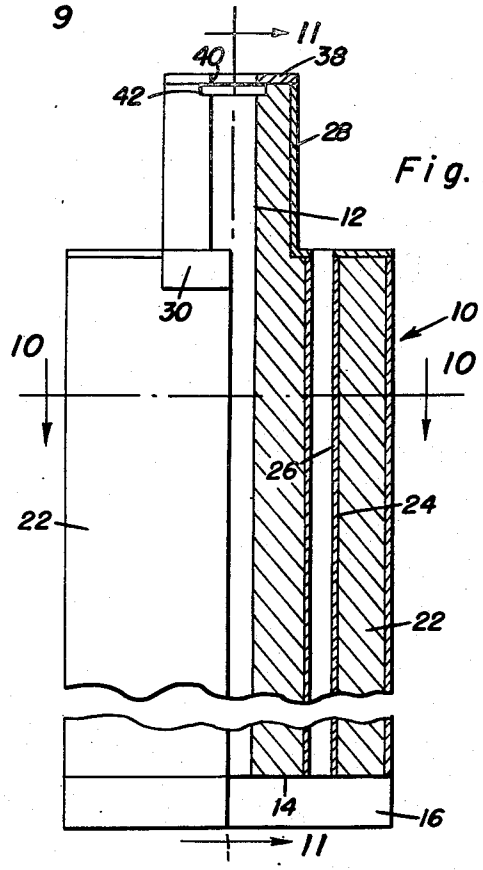


Fig. 9

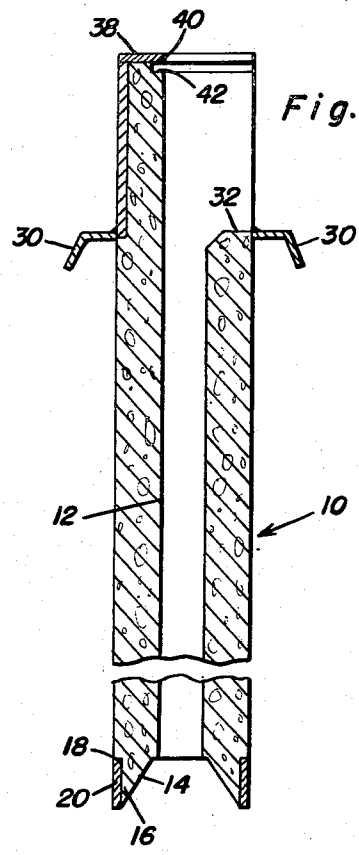


Fig. 11

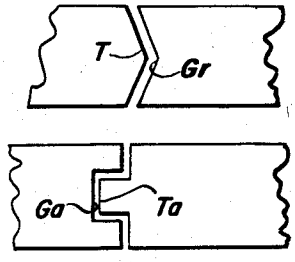


Fig. 12

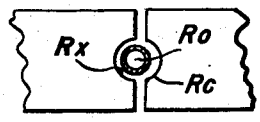


Fig. 13

Fig. 14

Edgar H. Latham, Jr.
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jackson
Attorneys

Patented Dec. 22, 1953 2,663,064

UNITED STATES PATENT OFFICE

2,663,064

APPARATUS FOR CONSTRUCTING SEA WALLS

Edgar H. Latham, Jr., Palm Beach, Fla.

Application August 18, 1952, Serial No. 304,869

3 Claims. (Cl. 25—118)

1

This invention relates to new and useful improvements in concrete forms and the primary object of the present invention is to provide apparatus for constructing concrete sea walls, retaining walls and the like.

Another important object of the present invention is to provide apparatus for constructing sea walls that will reduce expense, time and labor in the construction of a wall in water, and reduce the requirements of steel necessary for the strengthening or support of an upper bulkhead.

A further object of the present invention is to provide a plurality of cores that will be located between two spaced partition walls, and wherein the cores are removed one at a time as concrete is poured into the space occupied by the first core so that no water will contact the concrete to wash out or dilute the concrete.

A still further aim of the present invention is to provide a method and apparatus for constructing a retaining wall involving novel and improved means for completing a day's pouring in order to provide means for tying in the wall section poured the next day.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is an end view showing the initial step in constructing a retaining wall;

Figure 2 is a view similar to Figure 1 and showing the second step in constructing the wall;

Figure 3 is a vertical sectional view of Figure 2 after the core has been driven into the ground;

Figure 4 is a fragmentary view of Figure 2 showing the hammer being used for driving the core;

Figure 5 is an elevational view of Figure 3, the jet conduit removed;

Figure 6 is a side view of Figure 5 with parts broken away, and showing the first core being raised;

Figure 7 is a view similar to Figure 6, in smaller scale, and showing concrete being discharged into the space occupied by the first core as the second core is raised;

Figure 8 is a plan view of one of the cores;

Figure 9 is a vertical sectional view taken substantially on the plane of section line 9—9 of Figure 8;

Figure 10 is a horizontal sectional view taken

2

substantially on the plane of section line 10—10 of Figure 9;

Figure 11 is a vertical sectional view taken substantially on the plane of section line 11—11 of Figure 9;

Figure 12 is a fragmentary plan view showing one method for interconnecting adjacent cores; and,

Figures 13 and 14 are modifications of Figure 12.

Referring now to the drawings in detail, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a concrete form or core of suitable relatively heavy material, such as concrete that is formed with an axial bore 12.

The lower end of the core 10 is provided with a substantially V-shaped notch 14 defining a pair of ground penetrating feet 16 whose outer faces are formed with recesses 18 in which wear and reinforcing plates 20 are suitably fixed.

The core 10 is formed with a pair of longitudinally offset integral portions 22 each of which is provided with a vertical bore 24 having a metallic lining 26. The core 10 is provided with a metallic cap 28 that covers the upper end of the core. A pair of overhanging gripper flanges 30 are fixed to the cap 28 and project outwardly from opposite sides of the core.

The side of the core 10 from which one of the flanges 30 projects is formed with an opening 32 that extends to the axial bore 12. The opening 32 is sufficiently wide and high to accommodate the discharge chute C of a concrete filled hopper.

A pair of spaced parallel sheetings or liners 34 are adapted to rest against the side walls of the core with their upper ends engaged under the flanges 30, whereby the liners may be driven into the ground with the core. The outer faces of the liners 34 at the upper ends thereof support rigid arms 36 that extend upwardly from liners. The upper ends of the arms 36 are formed with apertures whereby a crane may be engaged with the arms for lifting the liners.

The upper end of the core 10 is shaped to be engaged with the follower block B of an air, steam or drop hammer H whose lower end is received over the upper end of the core.

The upper wall 38 of the cap 28 is provided with an opening 40 in registry with the bore 12 that overlies horizontal keyways 42 in the walls of bore 12. The keyways 42 will slidably receive the side edges of a plate having an upstanding

eye (not shown), whereby the core may be lifted or lowered by a crane attached to the eye.

In use of the invention a plurality of the cores **10** and their associated liners **34** are used in order to form a retaining wall of predetermined length. A framework F is assembled and includes guides G that will engage and guide the liners **34** as the same are driven into the ground.

A pair of liners **34** are disposed as shown in Figure 1 and a core is lowered therebetween until the flanges **30** engage over the upper ends of the liners. Then a jet pipe P is extended downwardly through the bore **12** to wash away the ground as the core and its liners are moved downwardly into the ground. An additional driving force in the form of the hammer H is employed for driving the core and its liners into the ground. The bore **12** is filled with a filler **44** which is held in place by a dowel (not shown) and a lifting eye (not shown).

After a suitable number of the cores and their liners having been driven into the ground with adjacent cores and adjacent liners contacting each other, reinforcing rods R, if required, are inserted in the bore **24** and these rods are driven into the ground to remain in position as the cores are raised.

The filler **44** of the first core is raised and then the first core is lifted upwardly by a crane and as the core is lifted concrete is poured into its opening **32** to replace the core as the latter is pulled upwardly. After the first core has been lifted and removed the crane is shifted to lift the second core while concrete is still poured into the space previously occupied by the first core.

Concrete C being poured into the space previously occupied by the first core will move into the space vacated by the second core as the second core is lifted. Next the third core is lifted and concrete is poured onto the concrete previously poured so that the concrete may occupy the space left by the third core. The cores are thus lifted in the sequence they are driven with concrete poured into the space vacated by the cores adjacent the one being lifted. The last pour of concrete for the day will receive a vertical pipe or rod Ro that will form a key for the next day's pour. Thus, the last core will have a vertical recess *Re* to receive the rod Ro and the initial core to be driven will have a recess *Rx* to accommodate the rod Ro (Figure 13).

The cores may be shaped to form the tie-in-keys for uniting the pours of different days or for centering adjacent cores. Figure 12 shows interlocking tongues T and grooves *Gr* of V-shaped formation and Figure 13 shows the interlocking tongues *Ta* and grooves *Ga* of substantially channel shaped formation.

In starting the wall construction, the initial core will be engaged with an existing wall structure, however, if the wall to be erected is incapable of being joined to an existing wall, then the liners of the first core are joined by a closure partition.

After the concrete has been poured into all the spaces previously occupied by the cores and the concrete has set the liners **34** are extracted and reset as shown in Figure 1. The bond between the liners **34** and the concrete is broken by driving a wedge between them with hammer H. Next the liners **34** are partly extracted two at a time by pulling, the pulling force comprising a crane attached to a lever which will grip the liners **34** and is engaged to them by rods through the arms **36**. The extracting of the liners **34** is assisted with the use of water or air jets.

Having described the invention, what is claimed as new is:

1. Apparatus for constructing retaining walls, said apparatus consisting of a plurality of vertical cores, a pair of spaced parallel liners engaging opposite walls of the cores, and means attached to the cores removably engaging the upper ends of the liners, whereby a core and its liner may be driven into the ground and whereby the cores may be lifted from the liners, said cores having side openings in their upper ends adapted to accommodate the discharge chute of a concrete filled hopper.

2. Apparatus for constructing retaining walls, said apparatus consisting of a plurality of vertical cores, a pair of spaced parallel liners engaging opposite walls of the cores, and means attached to the cores removably engaging the upper ends of the liners, whereby a core and its liner may be driven into the ground and whereby the cores may be lifted from the liners, said means comprising a pair of overhanging gripper flanges, and a header plate for the upper end portions of the cores to which the flanges are attached.

3. Apparatus for constructing retaining walls, said apparatus consisting of a plurality of vertical cores, a pair of spaced parallel liners engaging opposite walls of the cores, and means attached to the cores removably engaging the upper ends of the liners, whereby a core and its liner may be driven into the ground and whereby the cores may be lifted from the liners, each of said cores having longitudinally offset side portions, said offset side portions having vertical bores for receiving reinforcing rods.

EDGAR H. LATHAM, JR.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
763,213	Shuman	June 21, 1904
877,008	Skinner	Jan. 21, 1908
910,252	Wolfley	Jan. 19, 1909
1,586,030	De Huff et al.	May 25, 1926