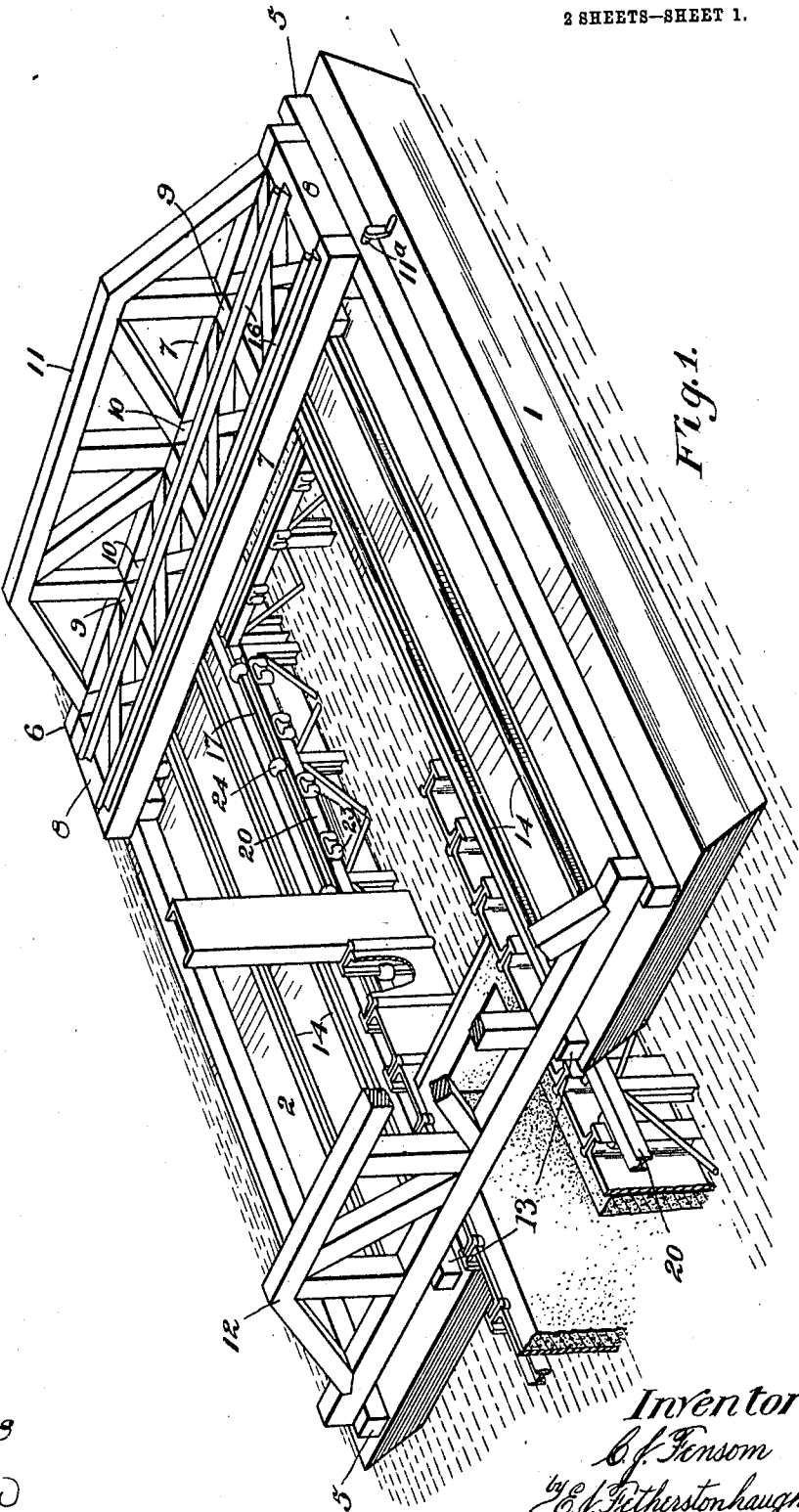


945,086.

C. J. FENSOM.
PILE CONSTRUCTION DEVICE.
APPLICATION FILED JAN. 23, 1909.

Patented Jan. 4, 1910.
2 SHEETS—SHEET 1.



Witnesses
A. J. Morrison
W. C. Muir

Inventor
C. J. Fensom
by E. J. Fetherstonhaugh
Atty.

945,086.

2 SHEETS—SHEET 2.



A. Remison
W^m C. Muir

C. J. Fensom
by E. J. Petherstonhaugh
Atty.

UNITED STATES PATENT OFFICE.

CHARLES JOSEPH FENSOM, OF TORONTO, ONTARIO, CANADA.

PILE-CONSTRUCTION DEVICE.

945,086.

Specification of Letters Patent.

Patented Jan. 4, 1910.

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To all whom it may concern:

Be it known that I, CHARLES JOSEPH FENSOM, a subject of the King of Great Britain, and resident of the city of Toronto, county of York, Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Pile-Construction Devices, of which the following is a specification.

10 The invention relates to improvements in pile construction devices, as described in the following specification and illustrated in the accompanying drawings that form part of the same.

15 The invention consists essentially in the novel construction and arrangement of parts, whereby the piles are held in suitable guides suspended from a barge, and said piles lowered and raised in said guides by a suitable
20 lowering and raising mechanism traveling on said barge.

The objects of the invention are, to facilitate the work of building piers, breakwaters, dams, caissons and other like structures, and
25 to provide a device for handling and placing piling with the least expenditure of time and labor.

In the drawings, Figure 1 is a perspective view of the device shown in operating position placing a set of piling for a section of a pier or breakwater. Fig. 2 is a cross section
30 through the device showing a traveling pile device mounted on one of the barges. Fig. 3 is an enlarged perspective detail of a portion of one of the guide-frames showing the means for securing the piles in the said guides and one means for raising the piles. Fig. 4 is a perspective detail of the end of
35 one of the guide-frames. Fig. 5 is an enlarged sectional view through the guide-strip and supports for the guide frames.

Like numerals of reference indicate corresponding parts in each figure.

Referring to the drawings, 1 and 2 are
45 barges having the bulk heads 3 and 4 therein forming water tight compartments in the bottom thereof. 5 are longitudinal timbers secured to the decks of the said barges.

6 is a frame-work formed of the side timbers 7 and end timbers 8 securely bolted together and braced by the cross timbers 9 and
50 diagonal braces 10.

11 is a truss extending upwardly from the

outer one of the side timbers 7 and firmly bolted thereto.

The ends of the frame work 6 rest on the longitudinal timbers 5 and are adjustably secured to said timbers by the screws 11^a, said screws being threaded in suitable blocks secured to the frame.

12 is a truss spanning the opposite ends of the barges and firmly secured to the longitudinal timbers 5 and supported at the inner sides of the said barges by the block 13.

14 are rails forming tracks secured to the decks of the barges toward their inner sides and extending from end to end thereof and upon which suitable traveling pile drivers or
65 derricks 15 are mounted.

16 are rails forming tracks secured to the frame work 6 and extending from end to end thereof and adapted to support a suitable pile driver or derrick.

17 and 18 are the upper and lower guide strips secured to the inner sides of the barges and extending from end to end thereon the upper strips 17 having the longitudinal
75 grooves 19 in their upper edges.

20 are the guide frames preferably formed of a pair of I beams suitably trussed and having the ends 21 formed of channel sections with the flanges turned inwardly, said channels having the pairs of vertical slots
80 22 at the top and bottom.

23 are the guides here shown as shaped to receive the flanges of the locking sections of the piling and secured to the I beams 20 and spaced apart to allow the insertion of the members of the piling arranged between said locking members. A particular form
90 of piling is shown herein, but it must be understood that many different forms of piling may be used with this device, the guides 17 being formed to suit. 24 are hook members

secured to the upper beam of the guide frames 20 and having a downwardly extending flange adapted to fit into the longitudinal grooves 19 in the upper guide strips, said hook members supporting said guide frames from the barges, the lower guide strips holding said guide frames in a vertical position.

25 are rods extending longitudinally of the guide frames and suitably supported. 26 are cam levers pivotally supported on the rods 25 and having the cam portions adapted to engage the pile members and lock said
105

members securely in said guides. 27 are links pivotally secured to said cam levers and extending through the cross slots 28 in the upper beam of said guide frames, said links having a notched edge and handles at their upper ends. The cam levers 26 are operated by the links 27 and said links securely held in a raised position by the teeth formed by said notches engaging the said beam and said links are held securely by suitable blocks or wedges 29 inserted in the slots 28 behind them.

The cam levers and their co-acting parts form a simple means for securing the pile members in the guide frames either to support the piles in a raised position from the barges or to hold the frames to the piling when the barges are taken away, but it must be understood that many simple means may be devised for securing said piles and frames together.

30 are brackets secured to the upper members of the guide frames having studs 31 secured therein. 32 are gear pinions turning on the studs 31. 33 are hand levers turning on the studs 31 and carrying the ratchet pawls 34, said ratchet pawls engaging the teeth of said pinions. 35 are spring held dogs secured to said brackets 30 and engaging the teeth of said pinions and holding said pinions from movement in one direction. 36 are gear racks secured to the piles extending between the locking members, said racks meshing with the gear pinions 32. This ratchet and gear mechanism is shown as applied to one of the piles, but it must be understood that it may be applied to all of the piles.

The locking pile members are shown provided with a plurality of holes 37 in their outer flanges. These holes are provided so that crowbars may be inserted therein to raise said members. Each of the piles is also provided with the holes 38 in the web portion through which a hook from the pile driver or derrick may be inserted to raise the said piles.

39 are pipes opening through the side walls of the barges below the water line and leading to the water tight compartment formed in the bottom thereof and said pipes are provided with suitable valves to control the inflow of water to said compartment. 40 are pumps of any suitable style connected by suitable piping to said water tight compartments and adapted to be used to empty said compartments of water when desired.

In the use of this device, the piles are placed in the guides and held by the locking devices with their lower ends a sufficient height to clear the bottom of the lake or other body of water in which the structure is to be built. The barges are then floated to their proper position and anchored. The

piling is then released and if the bottom is soft they will sink a considerable distance with their own weight. The traveling pile drivers may then be brought into use and operated to drive the piles to their proper position the barges remaining stationary. As soon as all of the piles are driven home with the guide frames locked thereto, a temporary caisson is formed. The valves in the pipes 39 are then opened and the water filling the water tight compartments sinks the barges a sufficient distance to disengage the hook members supporting the guide frames from the upper guide strips. The barges may then be floated away allowing the further operation of pumping out the water and sand from the caisson and the filling in of the concrete work. If a breakwater or pier is being constructed, after a few sections have been completed, the piling forming the sides of a completed section may be removed. In removing the piling, the barges are floated into place and the water emptied from the water compartments, thus raising them so that the hook members engage the upper guide strips. The piles are then raised either by the gear mechanism described or by the use of levers or by attaching the rope of the pile driver to the said piles and pulling them up, and as each pile is raised it is gripped by the cam levers and held securely. When the full complement of piles is raised, the barges are moved farther apart by means of the screws 11^a, so that the piling supported thereby will clear the piling of the succeeding sections of the work. The barges are then floated to the end of the end section and the ends of the guides are securely bolted to the preceding guide frames, thus obtaining a perfect alinement for the succeeding section.

The barges are shown secured together for placing a double row of piling, but it will be readily understood that the device may be used with equal facility for a single line of work, the barges being merely disconnected and rearranged so that the guide frames will be on the outer side of the barge.

Guides may be secured to the cross frame as shown or they may be supported at both ends for single piers or caisson work or they may not be used at all.

The details of construction of this device may be altered considerably without departing from the spirit of the invention, that is to say, so long as the essential feature of providing guides for the piles removably suspended from a barge and means for raising and lowering said piles, is adhered to.

It has been particularly shown and described that the guide frames are separable from the barges, but for deep water work it is desirable that the barges remain in position acting as a breakwater or support for

the fresh concrete work and in such cases the guides will be rigidly secured to the said barges.

What I claim as my invention is:—

- 5 1. In a pile construction device, the combination with a suitable barge, of a pile guiding frame suspended from said barge, and traveling means for lowering and raising said piles.
- 10 2. In a pile construction device, the combination with a suitable barge, of a pile guiding frame suspended from said barge, and a suitable pile driver traveling on said barge from end to end thereof.
- 15 3. In a pile construction device, the combination with a suitable barge, of a pile guiding frame removably suspended from said barge, traveling means for lowering and raising said piles in said frame, and means
- 20 for locking said piles to said guide frame.
4. In a pile construction device, the combination with a suitable barge, of a frame suspended from the side of said barge, guides for the piling fixedly secured to said
- 25 frame, means for lowering and raising the piles in said guides, and means for locking the piles in said guides.
5. In a pile construction device, the combination with a suitable barge, of a guide
- 30 frame suitably trussed and suspended from said barge and having a plurality of cross slots formed in the upper member thereof, a plurality of guide blocks rigidly secured to the upper and lower members of said guide
- 35 frame and arranged in pairs in vertical alinement, a rod extending from end to end of said guide frame, a plurality of cam levers pivotally supported on said rod, links secured to said cam levers and extending up-
- 40 wardly through the cross slots in the upper frame, said links having notches therein forming teeth adapted to engage the ends of said slots.
6. In a pile construction device, a barge
- 45 having longitudinal strips secured to the side thereof, one of said strips being adjacent to the top and the other below the water, the upper strip having a longitudinal groove therein, a guide frame suitably trussed and
- 50 having hook members secured thereto extending over said upper strip on said barge and resting in a longitudinal groove in said strip, guide blocks for receiving the pipe

members fixedly secured to said guide frame, and locking means supported in said guide 55 frame for locking the said frame and piles together.

7. In a pile construction device, the combination with a suitable barge, of a frame removably suspended from the side of said 60 barge, the end members of said frames having pairs of bolt slots adjacent to the upper and lower ends thereof, a plurality of guide blocks fixedly secured to the outer side of said guide frame and adapted to receive the 65 pile members, and means for locking said pile members to said frame.

8. In a pile construction device, a barge having bulk heads forming a plurality of water-tight compartments therein below, the 70 water line, said bulkheads having openings therein, pipes leading from said openings and communicating with the outside water, suitable valves in said pipes, means for pumping the water from said compartments, 75 a frame having suitable guides secured thereto in which the piles are slidably supported, said frame being detachably suspended from said barge, and means for locking said piles in said guides. 80

9. In a pile construction device, a pair of barges, each having a suitable track-way extending longitudinally thereon, a frame work rigidly secured to said barges at one 85 end thereof and holding said barges apart, said frame having a suitable track-way thereon, a truss extending across the other ends of said barges and rigidly secured thereto, suitable pile driving and raising mechanisms traveling on said track-ways, 90 and pile guiding frames removably suspended from said barges.

10. In a pile construction device, a pontoon forming an inclosure, a plurality of guides secured to said pontoons in said in- 95 closure, and traveling means supported on said pontoon for lowering and raising said piling.

Signed at the city of Toronto, county of York, Province of Ontario, in the Dominion 100 of Canada, this 12th day of January, 1909.

CHARLES JOSEPH FENSOM.

Witnesses:

H. DENNISON,
E. HERON.