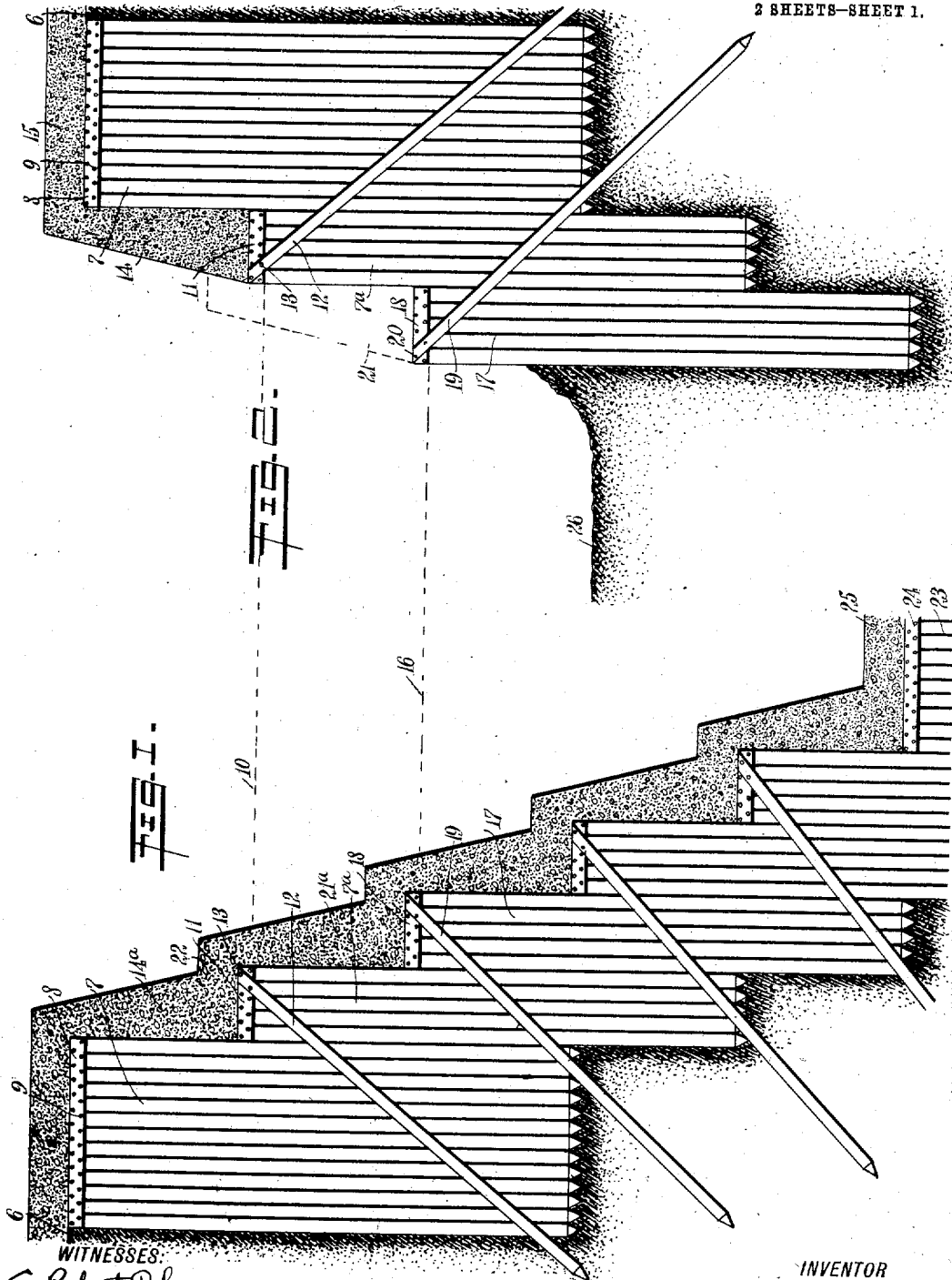


T. N. BERGE.
METHOD-OF BUILDING DOCKS.
APPLICATION FILED JUNE 16, 1910.

971,964.

Patented Oct. 4, 1910.

2 SHEETS—SHEET 1.



WITNESSES:
G. Robert Thomas
Walton Harrison.

INVENTOR
Torje N. Berge
BY *Mum & Co*
ATTORNEYS

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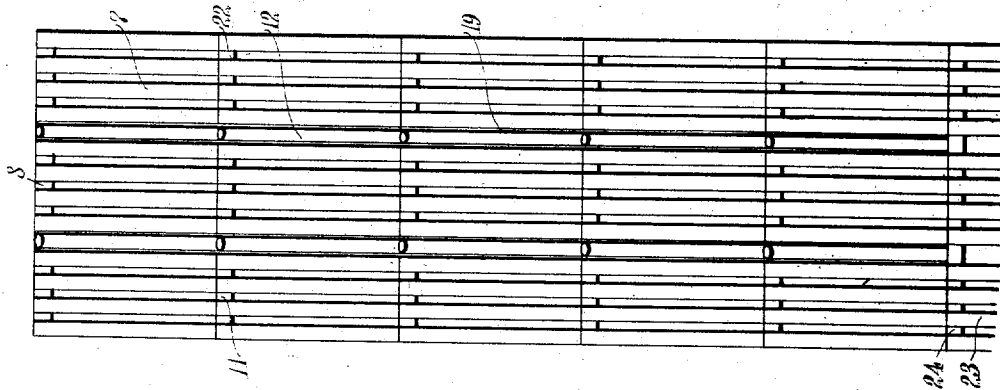


FIG. 3.

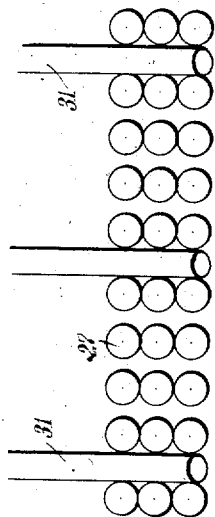
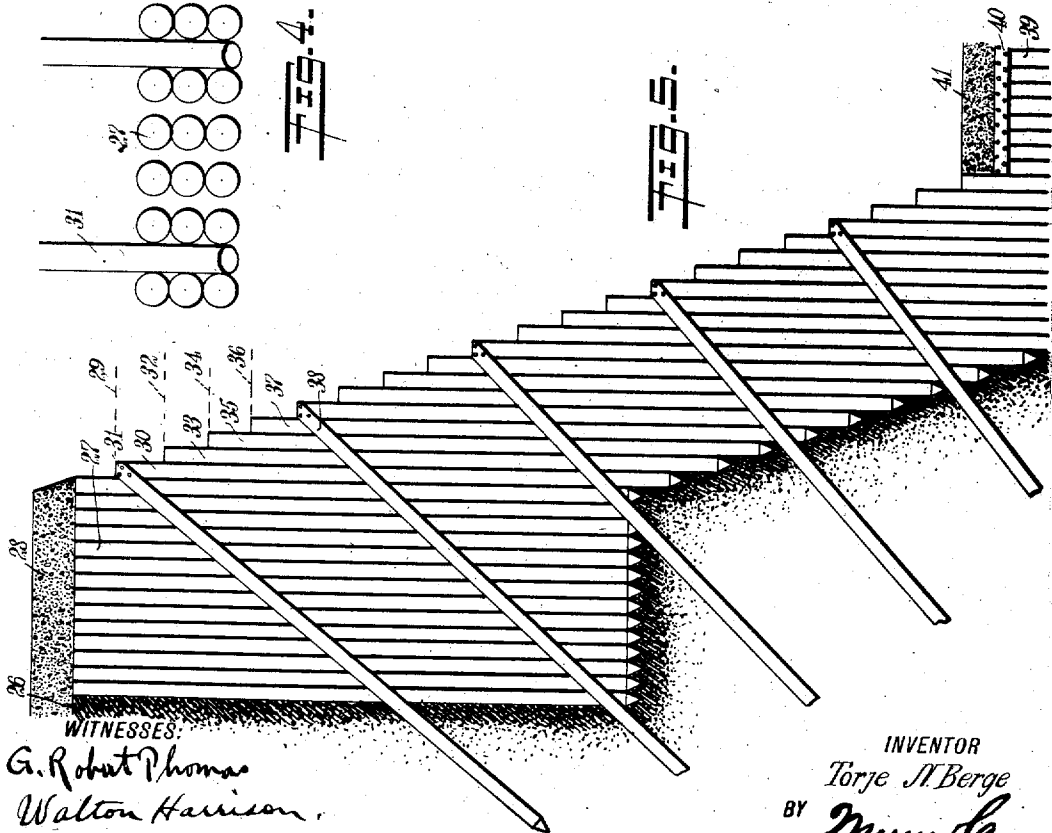


FIG. 4.

FIG. 5.



WITNESSES:

G. Robert Thomas
Walton Harrison

INVENTOR
Torje N. Berge
BY *Mumolo*
ATTORNEYS

UNITED STATES PATENT OFFICE.

TORJE NIELSEN BERGE, OF HOBOKEN, NEW JERSEY.

METHOD OF BUILDING DOCKS.

971,964.

Specification of Letters Patent.

Patented Oct. 4, 1910.

Application filed June 15, 1910. Serial No. 566,966.

To all whom it may concern:

Be it known that I, TORJE N. BERGE, a citizen of the United States, and a resident of Hoboken, in the county of Hudson and State of New Jersey, have invented a new and Improved Method of Building Docks, of which the following is a full, clear, and exact description.

My invention relates to methods of building docks and similar structures, my more particular purpose being to provide for performing the work progressively, beginning at the top of the ground and completing section by section of the dock wall as the excavation is carried downward—thus excluding, as far as practicable, the entrance of surface water while the work is being conducted.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a section showing a dock wall made in accordance with my invention and containing in this instance piling arranged in tiers and a concrete lining engaging and resting upon the piling; Fig. 2 is a fragmentary section showing a wall similar to that appearing in Fig. 1, but unfinished; Fig. 3 is an elevation showing the piling used for the wall, the concrete being removed for the sake of clearness; Fig. 4 is a plan view showing how the piling is arranged in a modified form of the invention—to wit, that exhibited in Fig. 5; and Fig. 5 is a vertical section showing my invention employed without completely covering the dock wall with concrete.

Referring more particularly to Figs. 1 and 2, the earth is shown at 6, the upper level of the earth as here shown being its natural upper level—qualified, perhaps, to the extent of being dressed off a little in order to enable work to proceed. I will assume that at the beginning of the work there is no excavation, the upper surface of the earth being level all over the area to be occupied by the dock. A number of piles 7 are together driven downwardly into the earth and are tied together at the top by aid of tie plates 8 resting directly upon the tops thereof and secured thereto by fastenings 9. The group of piles 7 may be extended indefinitely, being either carried completely around the greater portion of the dock or arranged to

reach any distance desired. An excavation is next made, the earth being removed and carted away so as to form a new level upon the line 10 in Figs. 1 and 2. Another group of piles 7 are next driven downwardly, but being started into the earth from the level of the line 10 and being sunken flush with the earth at this level, the tops of these piles are considerably lower than the tops of the piles 7, as will be understood from Fig. 1. Tie plates 11 are next secured upon the tops of the piles 7. In driving down all of the piles room is made between them at intervals, and after each tier or group is partially finished, a number of brace piles 12 are driven obliquely downward through the spaces thus left. The brace piles 12 are secured by fastenings 13 to the tie plates 11, as indicated in Fig. 1 and are extended entirely through all of the piling so as to dig into the earth, as indicated at the left of Fig. 1 and right of Fig. 2. A body of plastic material 14, preferably concrete, ground or cementitious material, or mortar, is now placed in position, as indicated at the left of Fig. 2, this body of plastic material resting partly upon the tie plates 11 and extending over the highest part of the piling to the earth 6. This is allowed to set. Another excavation is made so that the upper level of the earth inside of the construction is reduced to the level 16. Another group of piling 17 is now driven into place and tied by aid of the tie plates 18 and braced by aid of inclined brace piles 19, the latter being held to the tie plates 18 by fastenings 20. A quantity of plastic material is now placed in position so as to rest principally upon the tie plates 18, and formed into the shape indicated by dotted lines at 21 in Fig. 2, this plastic material reaching up and engaging the lower portion of the mass 14 and adhering to the same, forming altogether an integral structure, as indicated at 21 in Fig. 1, this mass becoming integral with the mass 14, forming a single solid mass, as indicated at 14, 21, in Fig. 1, and being provided with a terrace 22. The work is thus continued down step by step, the earth being cut away so that its upper surface assumes successively different levels until the work reaches an altitude sufficiently low to coincide with the bottom of the dock. This being done (see bottom of Fig. 1) a number of piles are driven downward and tied together by tie plates 24, and upon these tie plates is

spread a layer 25 of concrete or other plastic material.

In some instances, my invention is used as indicated in Figs. 4 and 5. The earth is shown at 26 and a number of piles 27 are driven downwardly into the earth, the upper ends of the piles being flush with the level of the earth. An excavation is then made adjacent to the piles 27 so as to reach an earth level 29. A row of piles 30 is next driven downwardly and flush with this last-mentioned earth level. Brace piles 31 are then driven in obliquely so as to extend entirely through the piling and reach into the earth 26. Another excavation is now made so as to reach the earth level 32, and a row of piles 33 is next driven into the earth and flush with the level last mentioned. Another excavation being made, reaching the earth level 34, a row of piles 35 is next put down. Then follows another excavation to a new level 36, this being followed by putting down a row of piles 37. This process is continued indefinitely until the proper level is reached to form the floor of the dock. At intervals pile braces 38 are driven obliquely through the piling and into the earth, as above described. The proper level being reached for the bottom, a number of piles 39 are driven downwardly and mounted upon them are tie plates 40. Over these tie plates is spread a thick layer 41 forming the flooring for the dock.

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

1. The method herein described of building docks, which consists in beginning at the surface of the earth, excavating downwardly therefrom to a definite level, completing a portion of a wall from the upper level of the earth to the level thus reached, next again excavating so as to reach a lower level, and next extending the wall downwardly to the level last reached, these steps being repeated until the wall reaches a proper depth.

2. The method herein described of building docks, which consists in driving piling into the earth so as to bring the top of the piling substantially flush with the upper surface of the earth, excavating adjacent to said piling so as to form a new earth level, driving piling into said last-mentioned earth level, and forming a wall of plastic material supported partly by said last-mentioned piling and partly by said first-mentioned piling.

3. The method herein described of building docks, which consists in driving piling

into the earth, removing portions of earth from one side of said piling, driving other piling into the earth, beginning at the level to which the excavation is carried, and spreading a plastic material upon all of the piling.

4. The method herein described of building docks, which consists in beginning at the normal surface of the earth, excavating downwardly and forming a succession of steps, placing a charge of plastic material upon the uppermost of said steps, allowing the same to set, placing another charge of plastic material upon the next lower step, the upper surface of said last-mentioned charge of plastic material reaching above the lowermost portion of the first-mentioned charge and adhering thereto, next excavating farther and forming another step, and filling in another charge, the process being repeated until the wall reaches the desired depth.

5. The method herein described of building docks, which consists in driving piles into the earth, removing portions of earth away from one side of said piling, driving other piles into the earth so that the upper level of said last-mentioned piles is lower than the upper level of said first-mentioned piles, thereby forming a step, tying together the piles thus placed, excavating again so as to reach the lower level, driving down other piles, and continuing this process until the dock wall has reached the desired level.

6. The method herein described, of building docks, which consists in driving down a number of piles, excavating the earth adjacent to one side of said piles, driving down another row of piles, excavating the earth to a new level flush with the top of said last-mentioned row, driving down another row of piles adjacent to the last row, excavating again to a new level, and continuing these steps until the upper level of the last piling corresponds to the depth to which the dock is to be dug.

7. The method herein described, of building docks, which consists in driving down piling to different levels, tying together the tops of the piling at said different levels, and securing said piling firmly in position by driving obliquely therethrough a number of inclined piles reaching into the earth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

TORJE NIELSEN BERGE.

Witnesses:

CHARLES MEYER,
JENS JENSEN.