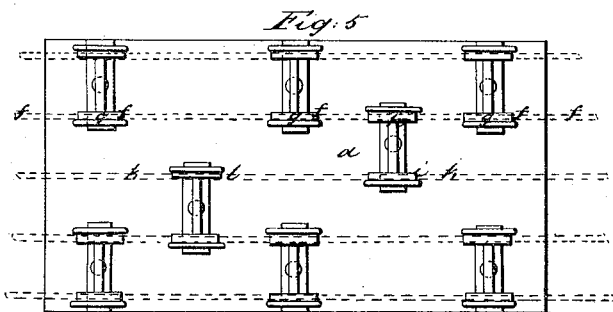
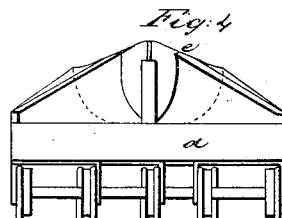
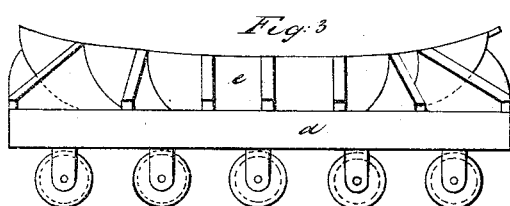
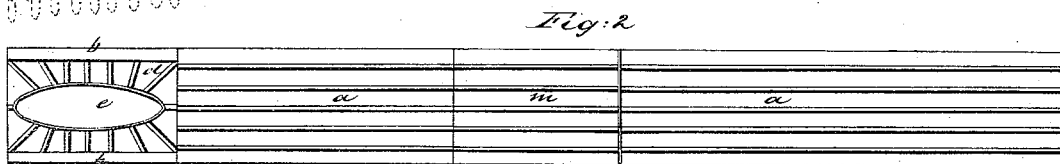
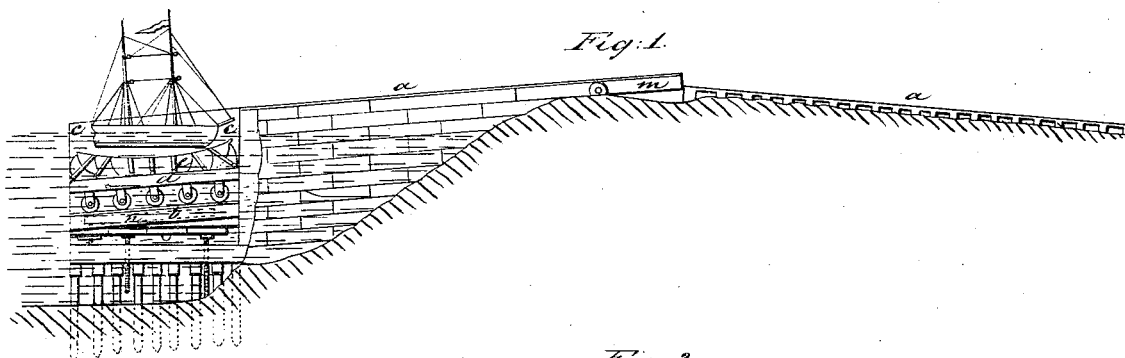


W. F. Channing.

Marine Way.

N^o 46,878.

Patented Mar. 21, 1865.



Witnesses
Francis Gould
W. B. Gleason

Inventor
Wm F Channing
by his Atty
J. B. Cross

UNITED STATES PATENT OFFICE.

WILLIAM F. CHANNING, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN MARINE RAILWAYS.

Specification forming of Letters Patent No. 46,878, dated March 21, 1865.

To all whom it may concern:

Be it known that I, WILLIAM F. CHANNING, of the city and county of Providence, and State of Rhode Island, have invented an improved method of overland transportation of vessels between navigable waters; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates to the overland transportation of ships, gun-boats, river boats, and other vessels from one navigable water to another. Canals between and connecting such waters have been to some extent constructed, and propositions have of late been made to build marine-railways instead of canals, by which vessels can be transported from one water to the other without detriment or breaking of bulk, the vessel to be floated into an open cradle or frame by which it is supported in transitu. On a small scale this has already been done upon canals, the railway being employed instead of locks, and the boat moved in a frame upon a truck or carriage over the incline between the high and low waters of the canal. By my invention, however, I dispense with a cradle or frame and transport the vessel while floated. For this purpose the opposite termini of the railway extending into the lake or other water, from or into which the boat is taken are provided with docks, a section of the railway extending over or into each of these docks and having suitable machinery applied by which it can be raised and lowered in the dock. Upon this section a railway-carriage is run, said carriage having mounted upon it and properly supported a water tank or caisson, which is raised and lowered with the terminal section of the railway. This carriage and caisson being run over or into the dock, the terminal section, and with it the railway-carriage and its caisson, are lowered or depressed in the dock to a depth sufficient to allow the vessel to be transported to float over the caisson. The railway-section is then raised until at the proper height to connect with the main track, the vessel being raised with and floated in the caisson, and being in this condition transported overland with ease and facility and without such straining and wrenching of the frame of the vessel

as must inevitably occur when transported in a frame and without the aid of a water support.

My invention, therefore, may be said to consist primarily in this method of transporting a vessel overland—that is to say, by means of a water support into which the vessel is floated in one lake, basin, or river, and from which, after overland transportation, it is floated into the lake, basin, or other water at the opposite end of the railway.

In connection with this method of transportation I employ a multiple track, which will be hereinafter described, and which, with some minor features, forms part of my invention.

Figure 1 of the drawings represents in elevation a portion of the railway, with one of the terminal docks, and its terminal railway-section, and the water caisson and carriage. Fig. 2 is a plan of the same. Fig. 3 is a side elevation of the water-caisson. Fig. 4, an end view thereof; and Fig. 5, a reversed plan of the water-caisson, carriage, or frame.

a denotes the main railway; *b*, one of the terminal sections thereof, supported in proper position with respect to the main way over a dock or basin, *c*, which opens into the waters from which or to which the vessel is to be transported. This terminal section *b* is so constructed and supported with reference to the dock or basin *c* that it can be raised and lowered in the same by any suitable mechanism. In Fig. 1 this section is shown as supported upon vertical screw shafts turning in nuts placed in a stationary bed-piece, the shafts being geared together so as to be rotated simultaneously to raise and lower the section. The railway-carriage or truck-frame is shown at *d*, it being provided with car axles and wheels placed at such distances apart as to give the requisite support to the carriage. Upon the top of this railway carriage or frame is placed an open tank or water-containing vessel, *e*, to which, in connection with the carriage which supports it, I give the name of "water-caisson." This tank is held in position and strengthened by buttresses, and if necessary, by a bulwark or such other means of support as may be required to sustain the sides of the tank. This water-caisson is so connected with the movable section *b* as to be raised and lowered with it when run

thereupon, for the purpose of submerging the tank. The tank is of such capacity as to float any vessel which may require to be moved upon it, and the section *b* and water-caisson *c*, submerge to such depth as to allow the vessel to freely float over the caisson, as shown in Fig. 1. Being in this position, the section *b* is raised, taking up with it the caisson and the floated vessel, until the track of the section connects with the main track. To draw the caisson up the inclination nearest the bank, a stationary engine may be used either alone or connection with a locomotive, a locomotive engine or engines being employed for drawing the caisson-carriage from one water to the other, as may be required.

The construction of the railway over which the vessel-containing car runs is as follows: A multiple series of rails is used, as seen in Fig. 2, they being arranged at such distances apart that, with the exception of the two outer rails, each rail may support the adjacent wheels of successive axles not in line. This will be better understood by reference to Figs. 2, 4, and 5, and particularly the latter figure, where the position of the rails with respect to the wheels is indicated by dotted lines. The rails, as shown, are five in number, answering for four tracks, the first and second rails answering for the first track, the second and third rails for the second track, and so on across the railway. Thus the inner rail, *f*, of the outer track may have the wheels *g* of the outer axles and the wheel or wheels *h* of other sets of axles running upon them, the opposite wheel or wheels *i* of this latter set running upon the same rail *k* as do the adjacent wheels *l* of axles placed laterally with respect to the axles of the wheels *h*. This arrangement enables the car to be supported upon fewer rails and the weight to be more equally distributed over the whole frame than if only two series of axles were used running upon parallel and separate tracks. This arrangement of the rails may be varied, but I prefer an arrangement substantially like this. The number and disposition of the wheels and axles will, of course, be varied to suit the requirements of transportation. The trucks upon which the wheels are supported are made capable of horizontal swiveling motion to the extent required to enable the car to run around slight curves of the railway, and the trucks may be capable of a vertical swiveling movement to whatever extent shall be neces-

sary. To enable the car, however, to pass from an ascending to a descending grade, or vice versa, a tilting table or section, *m*, may be placed at the angle of the two grades, the table being kept in connection with the rails from which the cars approaches until it runs upon the table, which is then turned by any suitable mechanism until in connection with the track of the other grade. Near the terminal section at each end of the track laterally moving sections may be constructed, by which cars can be moved from one main track to a parallel one to facilitate the making up and discharging of trains and the transportation to and from each terminus.

To support and to facilitate the raising and lowering of the terminal section in the dock air-tight compartments, boxes, or other floats are attached thereto, from which air may be expelled and water introduced to aid in sinking the section, and the water expelled and air introduced to aid in elevating the same, as circumstances may require.

I claim—

1. The employment of a water support or caisson in the manner and for the purposes described for the overland transportation of vessels between navigable waters; also, the combination of a water tank or basin (for floating a vessel) with a railway-car truck or trucks.

2. In a marine railway, a compound or multiple railway-track having parallel rails so disposed that each rail, excepting the two outer rails, may serve as a part of a track at each side thereof, in the manner and for the purposes herein described.

3. The combination of a multiple or compound track with a dock or docks at one or both extremities of a marine railway, for transportation of vessels from one body of water to another, as herein described.

4. The vertically-moving terminal section of the track, as herein described, constructed and arranged to operate in connection with elevating, supporting, and lowering apparatus, and with the water support or caisson to receive and discharge the vessel, substantially as set forth.

In witness whereof I have hereunto set my hand this 1st day of March, A. D. 1865.

WM. F. CHANNING.

In presence of—

FRANCIS GOULD,
W. B. GLEASON.