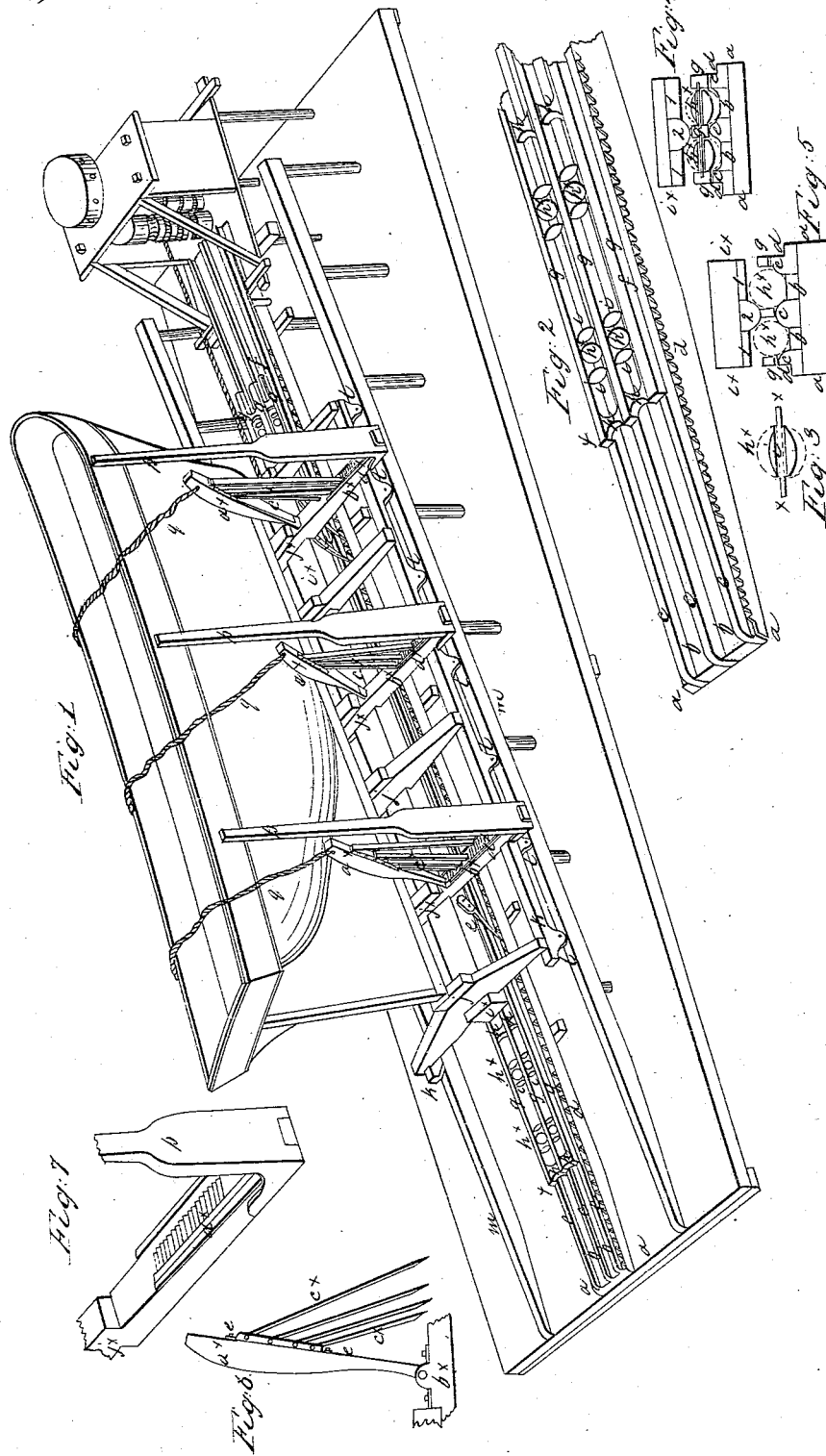


*A. Hannigan.*

*Marine Railway. Patented Jan. 16, 1843.*  
No 2,911.



# UNITED STATES PATENT OFFICE.

ANDREW FLANNIGAIN, OF BALTIMORE, MARYLAND.

## MARINE RAILWAY.

Specification of Letters Patent No. 2,911, dated January 16, 1843.

*To all whom it may concern:*

Be it known that I, ANDREW FLANNIGAIN, of the city of Baltimore and State of Maryland, have invented a new and useful Improvement in Marine Railways for Hauling Up Vessels for Repair; and I do hereby declare that the following is a full and exact description thereof.

My principal improvement consists in the manner in which I arrange a series of round, iron balls between friction rollers, in a frame, and combine the same with the railway, for the purpose of lessening the friction as the vessel and the cradle upon which it rests, are hauled up, I have, however, made certain other improvements in the arrangement of the respective parts of the apparatus employed, by which they are rendered more convenient and efficient than in other structures erected for the same purpose, and although it is not my intention to prefer any special claim to some of these improvements, I deem it proper to describe the whole apparatus, as used by me.

In the accompanying drawing, Figure 1, represents a vessel as raised on the ways; and the other figures show certain parts of the apparatus in detail.

In each of these figures where like parts occur they are designated by the same letters of reference.

$a, a$ , are the ends of the rail-way upon which the cradle and its load are to be sustained; upon this way, two wrought iron rails  $b, b$ , are to be firmly secured; between these iron rails, and on each side of them there are affixed strong bars, or longitudinal pieces, of cast-iron, as shown at  $c, c, c$ ; which cast-iron pieces are raised above the surfaces of the wrought-iron rails, so as to constitute two troughs, of which the wrought-iron rails form the bottoms. On the outer edges,  $d, d$ , of the outside raised pieces  $c, c$ , ratchet teeth are formed, to receive the pawls  $e, e$ , which are attached to the shoe, or lower part, of the cradle, which shoe is shown at  $i^x, i^x$ .

The cradle upon and within which the vessel is to be carried up, consists of the shoe, or lower part,  $i^x, i^x$ ; the transverse pieces  $j, j, j^x, j^x$ , which are attached to the shoe; the bilge pieces  $a^x, a^x$ , which are hinged to the transverse pieces  $j^x, j^x$ , at  $b^x, b^x$ , and

the pawls  $e^x, e^x$ , which are hinged to the bilge pieces. To the outer ends of the transverse pieces  $j, j$ , are attached the longitudinal pieces of timber  $k, k$ , which carry friction rollers  $l, l$ , that run on the side ways  $m, m$ . The shoe is faced on its under side with wrought iron bars,  $1, 1$ , as shown in the end, or sectional views Figs. 4 and 5; and between the wrought-iron bars  $1, 1$ , are affixed the cast-iron bars, or longitudinal pieces,  $2, 2$ , which pass in between the iron balls  $h^x, h^x$ , and thereby serve to retain the cradle in place.

Fig. 6, is an enlarged view of one of the bilge pieces,  $a^x$ , and of the pawls  $e^x, e^x$ , attached to them;  $d^x$ , Fig. 7, are ratchet teeth for the pawls  $e^x$ , to fall into, as the bilge pieces are hauled up against the vessel, by the ropes  $q, q$ . The upright pieces  $p, p$ , may rise twenty feet, more or less, from the ends of the cross pieces  $j^x, j^x$ , and serve as guides in placing the vessel on the center of the cradle.

In Figs. 1, and 2, but more distinctly in the latter,  $f, f$ , represents the frame, with its balls and friction rollers, which is interposed between the ways and the cradle. This frame consists of three longitudinal bars  $g, g, g$ , of wrought-iron, which have brackets, or division pieces,  $h, h$ , placed between, and firmly combined with, them; these brackets may be of cast, or of wrought, iron, and may be placed from one to two feet apart, as may be preferred. Between the longitudinal pieces  $g, g$ , are placed the cast-iron balls  $h^x, h^x$ , and these are kept in place, and allowed to revolve freely, by the aid of the friction rollers  $i, i, i, i$ ; one of which is shown separately in Fig. 3, with its axis  $w w$ . The arrangement and combination of the parts constituting the frame, and the manner of connecting it with the ways, and with the shoe of the cradle, are shown distinctly in Figs. 4, and 5.

Having thus, fully described the manner in which I construct and use the respective parts of my marine rail-way, what I claim therein as new, and desire to secure by Letters Patent, is—

The manner in which I combine the frame  $f$ , with the ways and with the shoe of the cradle; that is to say; I claim, in combination, the iron balls placed between friction

rollers in the frame, the said balls resting  
on the ways, and the cradle being retained  
in place by the projecting piece marked 2,  
in Figs. 4, and 5, which projecting piece  
5 passes between the cast-iron balls. I do not  
claim the use of round balls to operate as  
friction rollers, these being well known, and  
used for that purpose, in machinery of

various kinds, but I limit my claim, as above  
indicated, to the special arrangement, and 10  
manner of using them herein set forth.

ANDREW FLANNIGAIN.

Witnesses:

THOS. P. JONES,  
EDWARD MOHLER.