

(No Model.)

2 Sheets—Sheet 1.

M. J. PAUL.  
HOISTING APPARATUS.

No. 475,888.

Patented May 31, 1892.

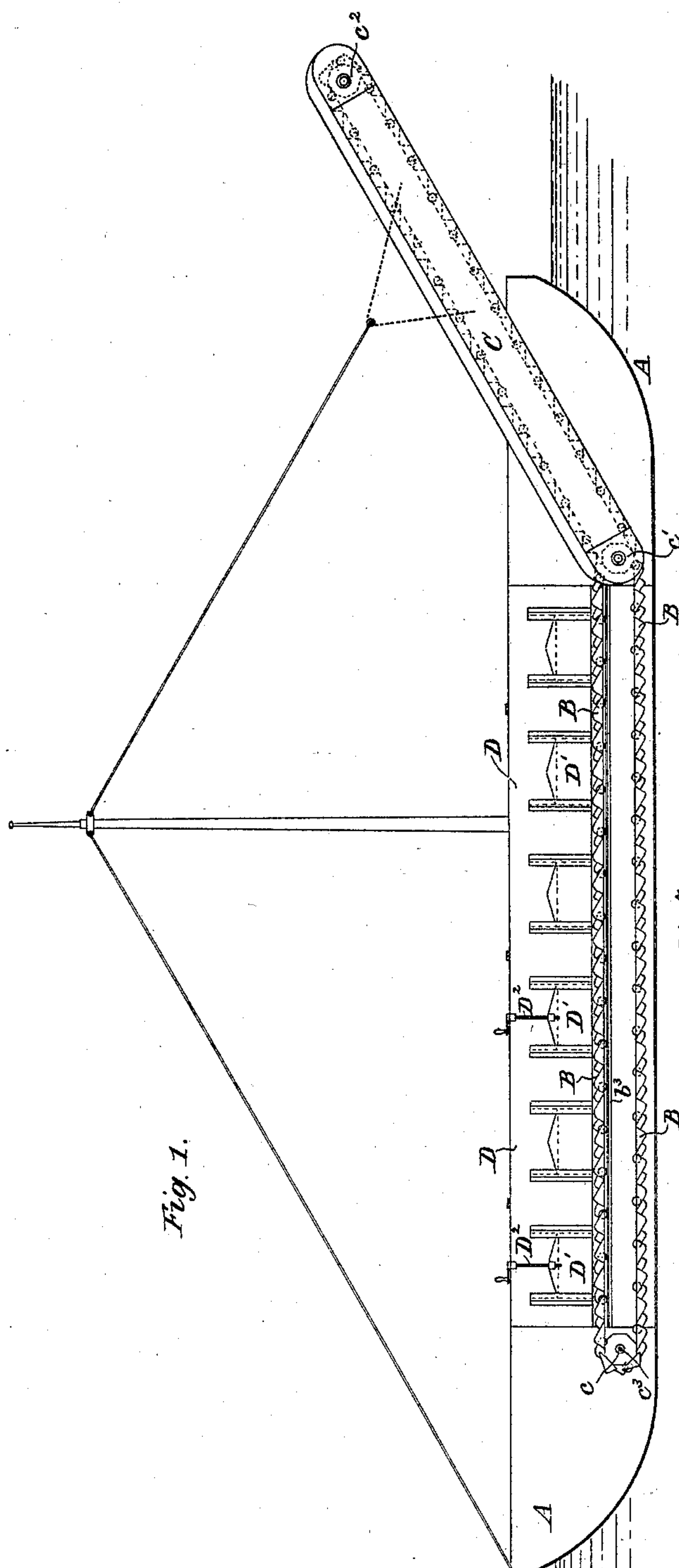


Fig. 1.

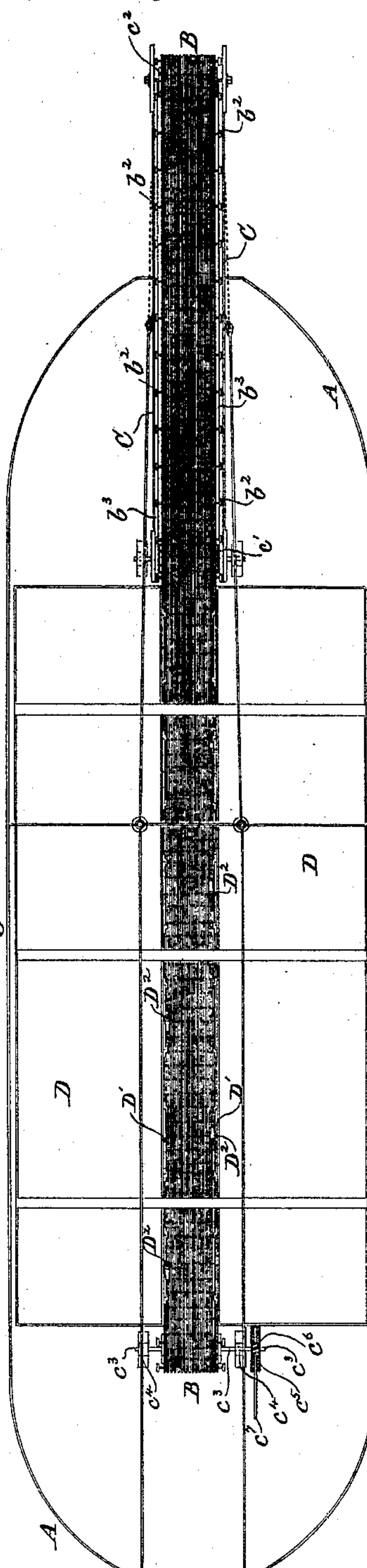


Fig. 3.

WITNESSES.  
*Hayling*  
*John H. Rennie*

INVENTOR.  
*Michael John Paul*  
*By Henry Bonnell*  
*Att'y*

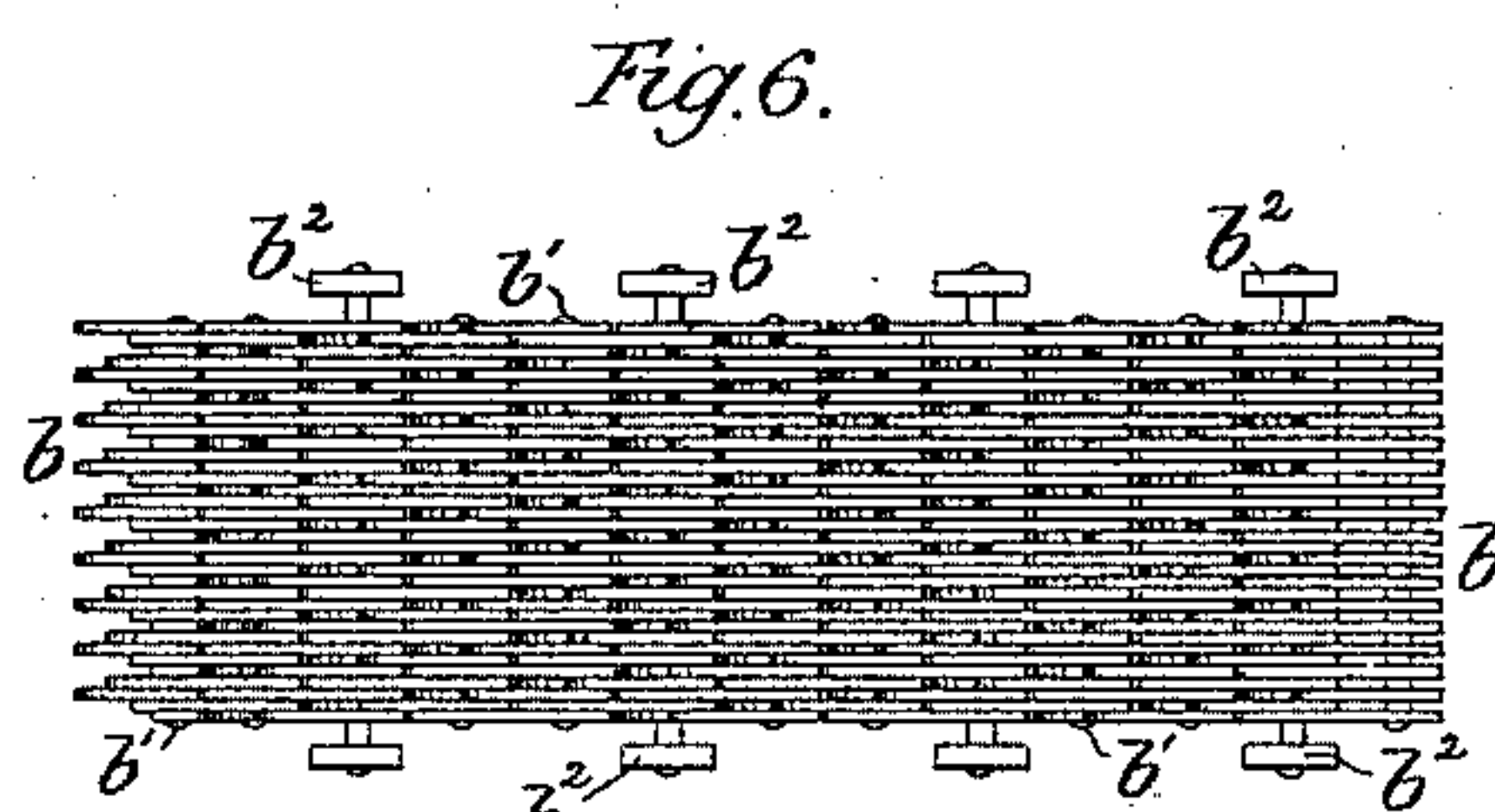
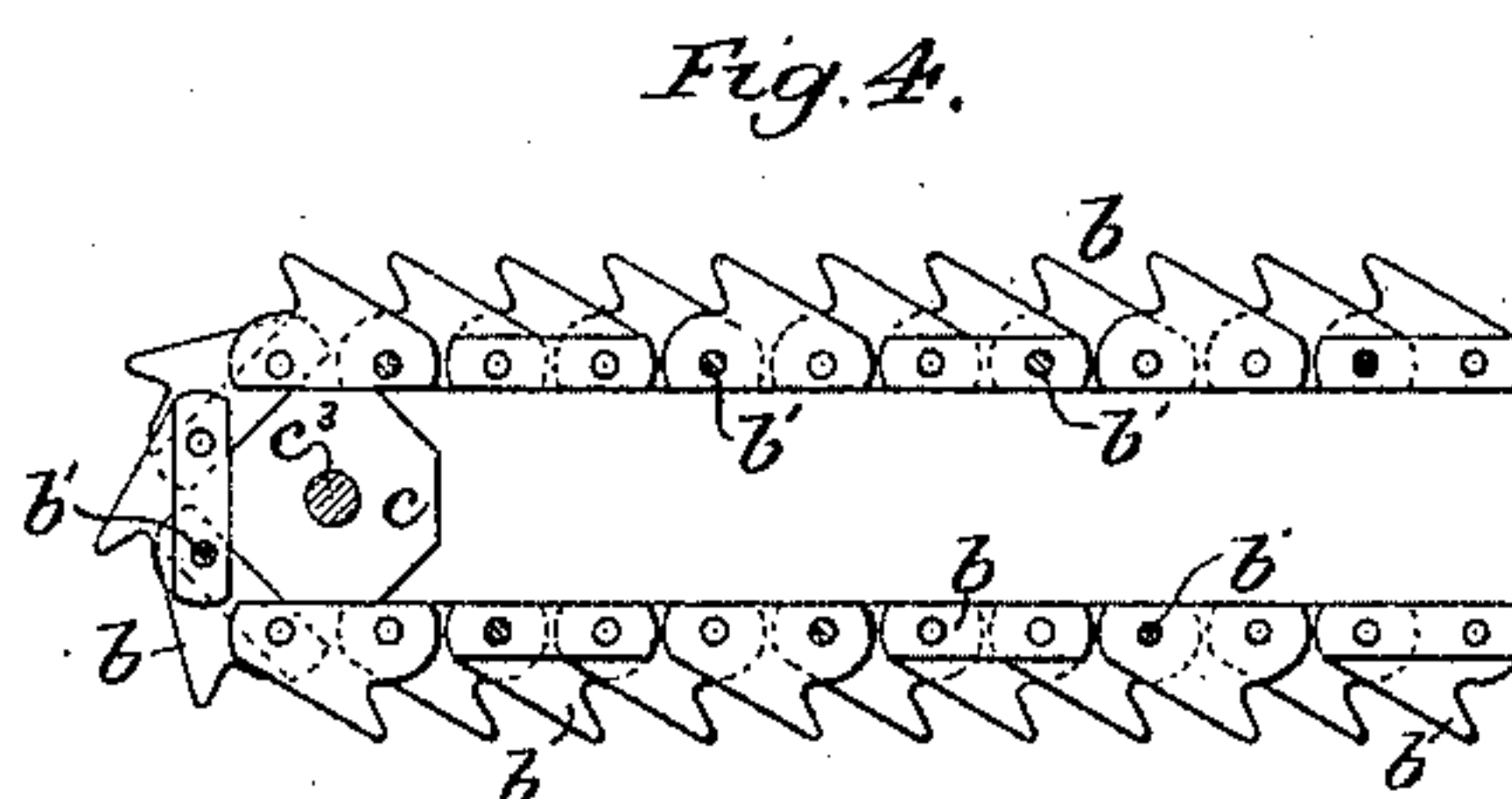
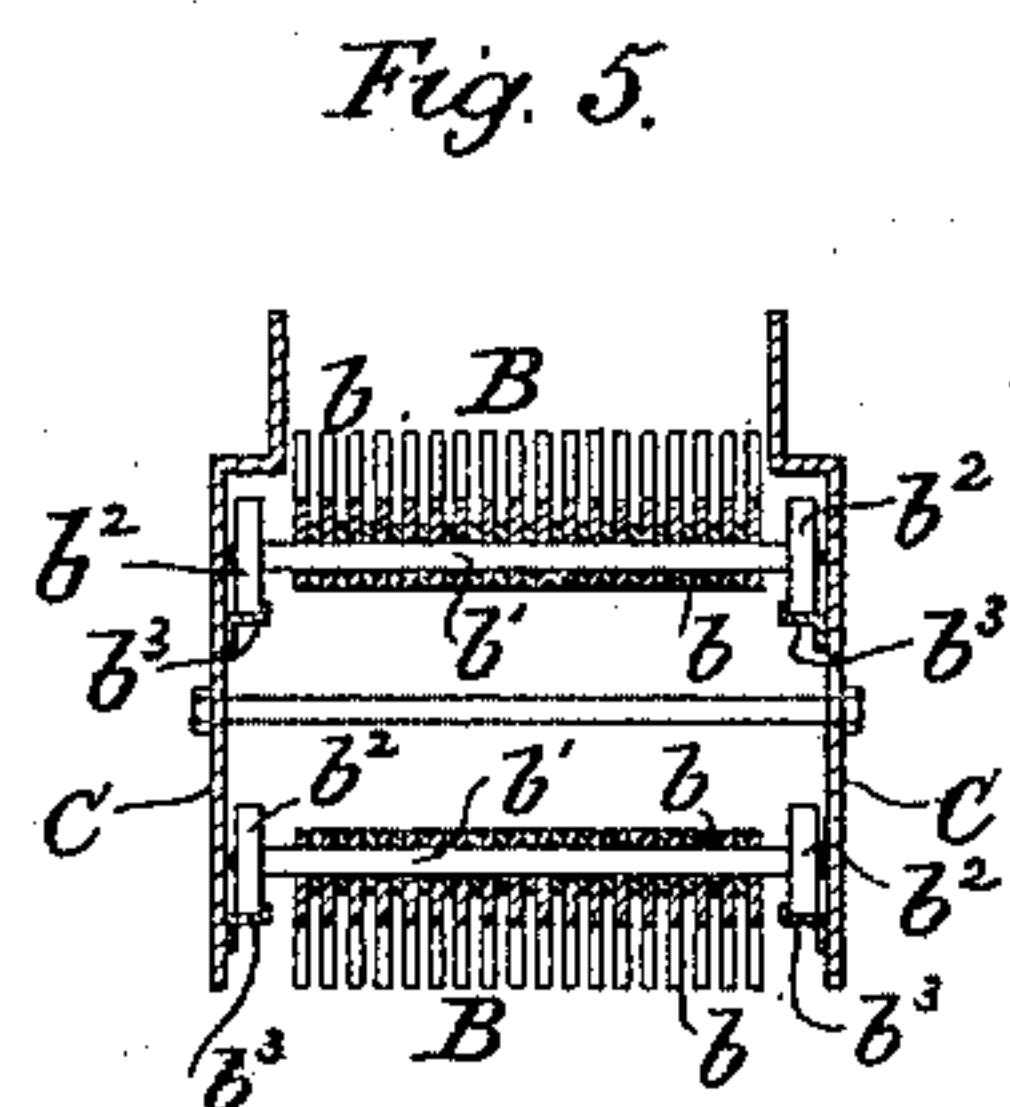
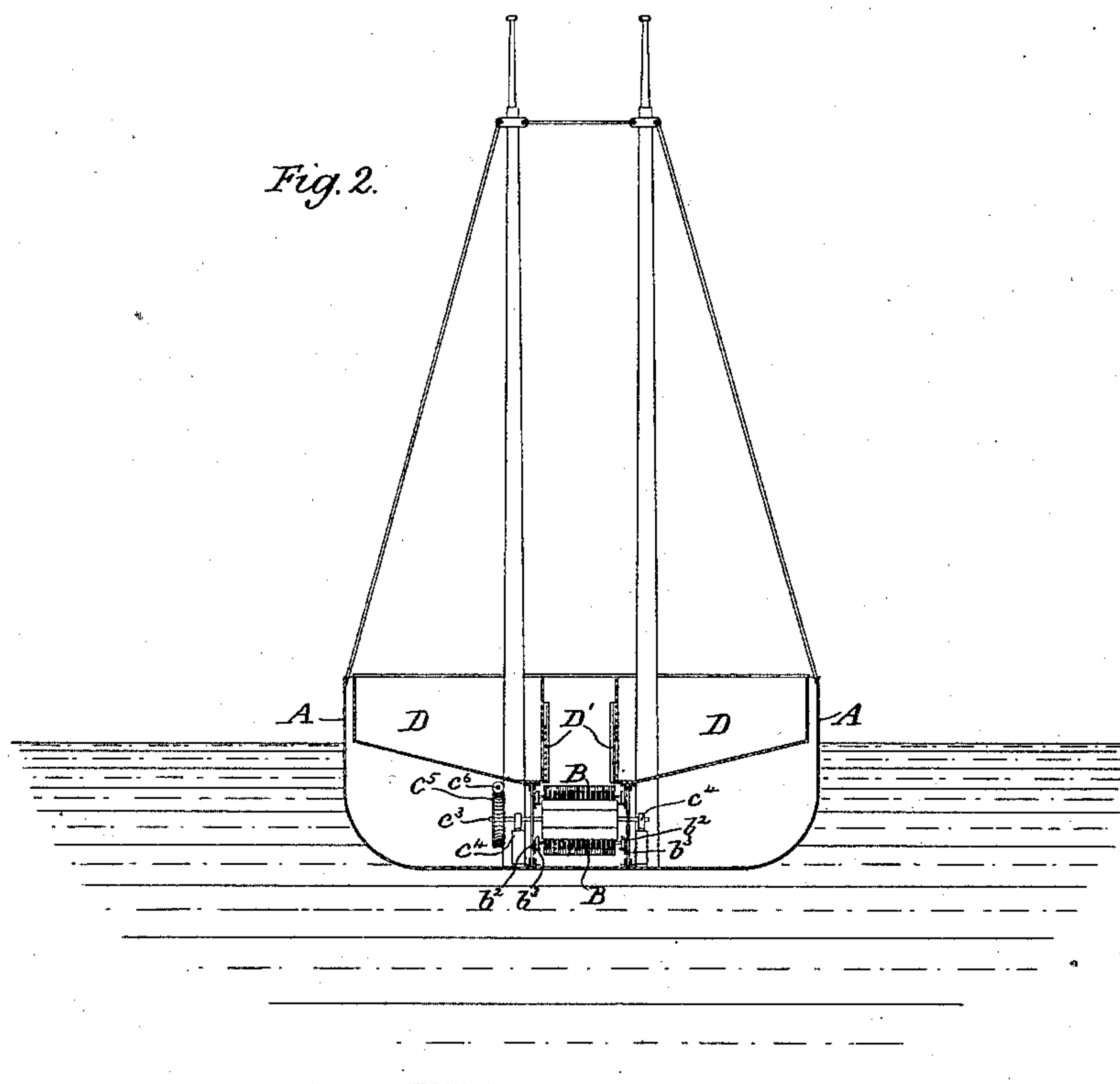
(No Model.)

2 Sheets—Sheet 2.

M. J. PAUL.  
HOISTING APPARATUS.

No. 475,888.

Patented May 31, 1892.



WITNESSES.

*John A. Rennie.*

*Michael John Paul,*  
*By Henry Connelley*

INVENTOR.



# UNITED STATES PATENT OFFICE.

MICHEL JOHN PAUL, OF LONDON, ENGLAND.

## HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 475,888, dated May 31, 1892.

Application filed December 31, 1890. Serial No. 376,385. (No model.) Patented in England February 10, 1890, No. 2,140.

*To all whom it may concern:*

Be it known that I, MICHEL JOHN PAUL, a subject of the Queen of Great Britain and Ireland, residing at 18 Montague Place, Russell Square, in the county of Middlesex, England, have invented certain new and useful Improvements in Discharging Coal and Similar Cargo from Lighters to Ships or Wharves, (in respect whereof I have applied for Letters Patent in Great Britain, bearing date February 10, 1890, No. 2,140,) of which the following is a specification.

This invention relates to means for coaling ships or for conveying coal or other cargo in bulk to wharves or places where the same is to be discharged, the principal object of the invention being to facilitate the discharge of the cargo, whether for the purpose of coaling a ship or otherwise.

In the accompanying drawings, Figure 1 represents, partly in longitudinal section and partly in side elevation, a barge or "lighter" provided with means for coaling ships arranged in accordance with the present invention. Figs. 2 and 3 are respectively a corresponding transverse section and a plan. Figs. 4, 5, and 6 are enlarged detail views showing, respectively, the traveling bed in side elevation, transverse section, and plan.

In carrying out my invention I employ a barge or lighter A, provided with a traveling bed B, arranged by preference along the floor of the barge and then inclining upward and passing over the extremity of an elevated structure C, resembling the arm of a derrick.

The bed B consists of an endless flat chain which travels on three drums  $c$ ,  $c'$ , and  $c''$ . The drum  $c$  is the driving-drum and is keyed on a shaft  $c^3$ , mounted to rotate in bearings  $c^4$ . A worm-wheel  $c^5$  is fixed on one end of the shaft  $c^3$  and is driven by a worm  $c^6$  on a worm-shaft  $c^7$ . The latter may be caused to rotate by a suitable engine carried by the barge. The chain is built up of series of plates or links  $b$ , which are jointed together by means of transverse rods  $b'$ . Every third rod is provided at each end with a roller  $b^2$ . These rollers run on rails  $b^3$ . The outer end of the structure C may within certain limits be raised or lowered, according to the level at which the cargo is to be discharged, or may

be raised to a vertical position or folded back when out of use or while the lighter is moved from place to place.

In order to prevent the coal or other material whereof the cargo consists falling back along the traveling bed while ascending the incline, I form the plates or some of the plates comprising the endless chain of triangular shape, as represented in Fig. 4, so that the upper edge of each plate in that portion of the bed traveling up the structure C may be approximately horizontal. The coal or other cargo is disposed in coal-bunkers D on each side of that portion of the traveling bed arranged along the floor of the barge and may be rapidly transferred thereto by manual labor, or the floors of the coal-bunkers may incline downward toward the center of the barge, as shown in Fig. 2, and may be provided with sliding doors  $D'$ , which, upon being lifted by the rotation of the screws  $D^2$ , release the coal or other cargo from the bunkers and permit it to fall upon the traveling bed. If preferred, the coal-bunkers or the floors thereof may be hinged at their edges adjoining the traveling bed. Each floor may then in the normal position be horizontal or may incline downward toward the side of the barge. The object of this construction is to enable the floors of the coal-bunkers to be gradually raised by mechanical means, so that the whole of the coal or other material may be fed to the traveling bed without requiring manual assistance. This construction has the further advantage that the stowage capacity of the barge is better utilized, owing to the avoidance of rise of floors in the bunkers. The coal is carried on the traveling bed over the drum  $c''$ , whereupon it falls into an inclined trough or chute, and is thereby conducted to the place where it is required to be deposited. In some cases, however, the use of the trough or chute may be dispensed with.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. For elevating coal and similar cargo and discharging the same from a barge or lighter, a traveling bed or endless chain B, formed of plates or links  $b$ , jointed together by means of rods  $b'$ , the trailing ends of the plates being of greater depth than the leading ends, so as

to compensate for the inclination of the elevator and to overcome the tendency of the cargo to fall back while ascending the incline.

2. The combination, with a vessel A, of the  
5 two rows of bunkers D, one along each side of the vessel and opening on a passage along the center line of the vessel, and a track  $b^3$  in the vessel, of the endless traveling bed B, having  
10 rollers which run on said track, the drums on which said bed is mounted, the structure or

arm C, pivoted at its lower end to the vessel and carrying one portion of the continuous traveling bed, and means for raising, lowering, and supporting the elevated end of the structure C, substantially as set forth.

MICHEL JOHN PAUL.

Witnesses:

S. J. MURAD,  
E. TURK.