(No Model.) 3 Sheets—Sheet 1.

M. J. PAUL.

HOISTING APPARATUS.

No. 465,114. Patented Dec. 15, 1891.

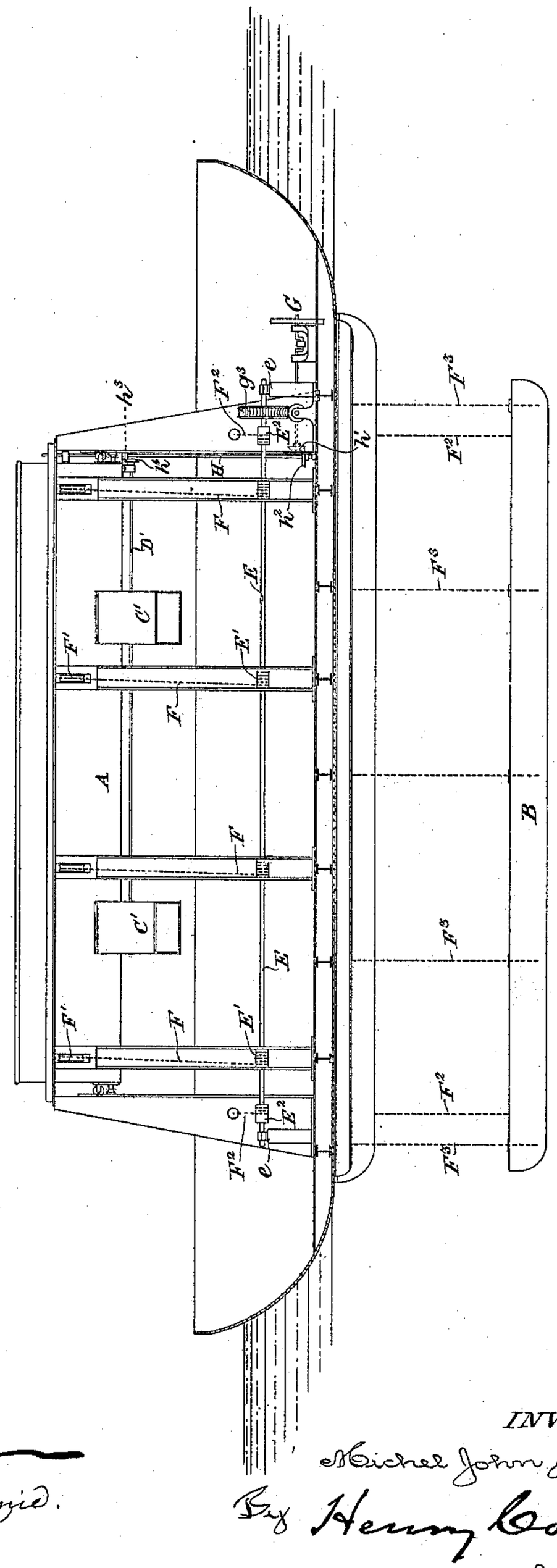

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 4.

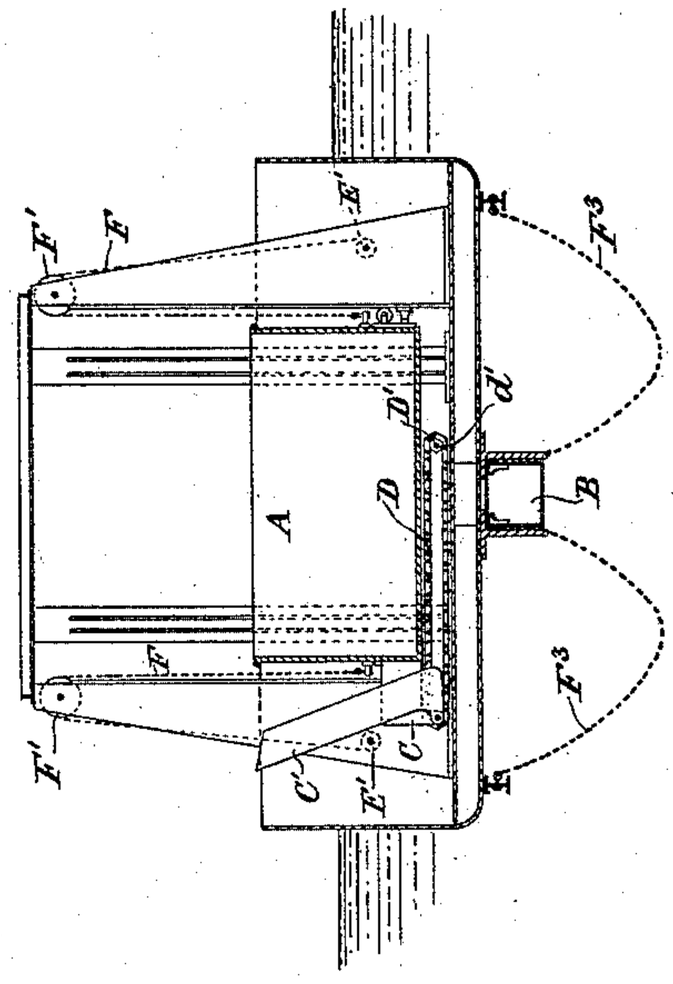
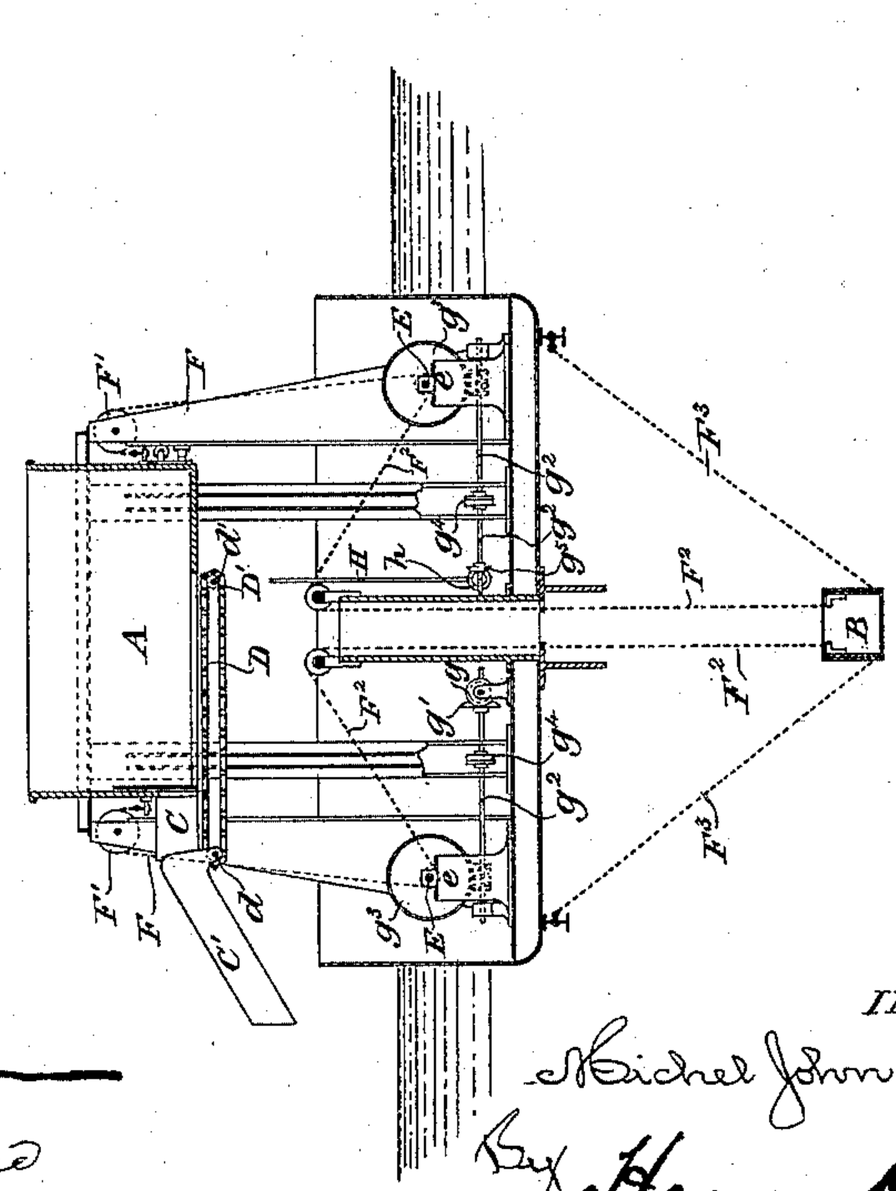


Fig. 2.



WITNESSES.

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(No Model.) 3 Sheets—Sheet 3.

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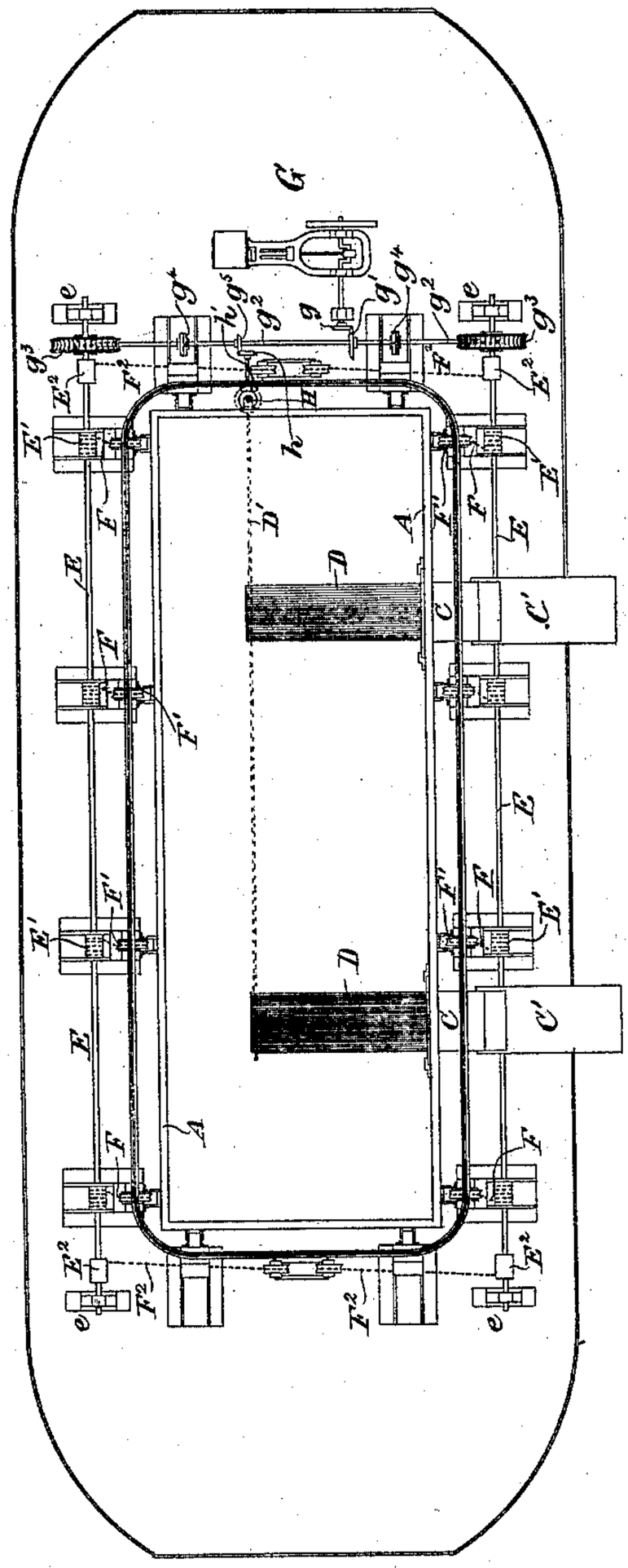
HOISTING APPARATUS.

No. 465,114. Patented Dec. 15, 1891.

Fig. 3.



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UNITED STATES PATENT OFFICE.

MICHEL JOHN PAUL, OF LONDON, ENGLAND.

HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 465,114, dated December 15, 1891.

Application filed December 31, 1890. Serial No. 376,384. (No model.)

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, London, in the county of Middlesex, England, have invented certain new and useful Means for Coaling Vessels or Conveying Coal and other Materials from Vessels to Wharves or other Places, of which the following is a specification.

In applying this invention, by way of example, to the coaling of a ship I employ lighters, having movable hoppers or bunkers, which can be lifted by mechanical means. The hopper or bunker receives the cargo of coal in bulk. To deliver the coal, the hopper or bunker is lifted so that the coal is raised above the point at which it is required to be discharged. An inclined trough or chute is then arranged beneath the hopper, and the coal descending the chute is thereby directed to the desired place. By suitable arrangements of the usual kind the descent of the coal can be controlled or arrested, if necessary. In order to afford the barge the requisite stability when the loaded hopper is raised, a drop keel or counterbalance is employed. The drop-keel is lowered from its normal position while the hopper is being raised, and rises again to its normal position as the hopper descends.

In the accompanying drawings, Figure 1 represents, partly in longitudinal section and partly in side elevation, a coaling-lighter provided with apparatus arranged in accordance with the present invention, the apparatus being in position for enabling the cargo to be discharged. Figs. 2 and 3 are respectively a corresponding transverse section and a plan. Fig. 4 is a transverse section showing the hopper and the drop-keel or counterbalance in their normal positions.

A is a movable hopper or coal bunker.

B is a drop-keel or counterbalance.

In Figs. 1 and 2 the hopper is raised into position for enabling the cargo to be discharged, the drop-keel being lowered. In Fig. 4 the hopper is lowered into the position it occupies when the lighter is going from place to place, the drop-keel being raised.

C C′ are chutes leading from the bottom of the coal-bunker. Each chute is made in two parts, the outer part C′ being hinged to the inner part C. The outer part may be drawn in against the side of the hopper, as represented in Fig. 4, when the chute is not in use. D are endless chains which travel over the bed of the hopper. These chains serve to facilitate the discharge of the cargo by drawing the coal (which may be shoveled thereon) toward the chutes. Each chain is arranged opposite one of the chutes and passes round a guiding-drum d and a driving-drum d', the latter being keyed on a longitudinal shaft D′.

E are shafts mounted in bearings e. These shafts carry drums E′ for the chains F, by means of which the hopper is raised or lowered. The chains F pass over guiding-pulleys F′. The drop-keel is lowered or raised by means of chains F^2, which are coiled on drums E^2, fixed on the shafts E. The keel, when lowered, is attached by side chains F^3 to each bilge, one set or the other of these chains serving to communicate a righting force to the barge in the event of the latter being keeled. G is an engine for driving independently the shafts E and D′. The shafts E are driven through the bevel-pinions g and g' and the worm-shaft g^2. The worms on the worm-shaft g^2 gear with and drive the worm-wheels g^3 on the shafts E. The shaft g^2 is in three parts, which are united by two clutches g^4. These clutches are thrown out of action when it is desired to disconnect the shafts E from the engine. The shaft D′ is driven from the shaft g^2 through the bevel-pinions g^5, h, h', h^2, h^3, and h^4. The pinion h^2 is keyed on the lower end of a vertical shaft H, the pinion h^3 being carried in bearings on the hopper and sliding along the shaft H as the hopper is raised or lowered. The pinion h^3 is caused to rotate with the shaft H by means of a feather, which slides in a feather-way cut in the shaft. A clutch or equivalent device is provided between the shafts g^2 and H in order that the endless chains D need only be driven while the cargo is being discharged.

The means described for disconnecting the shafts E or the shaft D′ from the engine G are given by way of example only. Other means for accomplishing the same end may be devised. For instance, the engine G, when working in one direction, may be arranged to

drive the shafts E, the shaft D′ remaining stationary, and when working in the other direction to drive the shaft D′ the shafts E remaining stationary. Under such circumstances the shafts E would be connected to the engine by a clutch capable of communicating motion in one direction only, the shaft D′ being similarly connected to the engine.

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

1. In a lighter for coaling vessels or for conveying coal and other materials from vessels to wharves or other places, the combination, with the vertical guides fixed to the lighter and the movable hopper or coal-bunker A, guided thereby, of the chutes C C′, the endless chains D on the bed of the hopper, the hoisting and lowering chains F, the shafts E, and the drums E′, substantially as and for the purpose set forth.

2. In a lighter for conveying coal or other materials to ships or wharves, the combination, with a movable hopper or bunker A, capable of being raised or lowered, of a drop-keel B, capable of being lowered and raised, the latter serving to partially counterbalance the loaded hopper, and to afford increased stability to the floating structure.

3. In a lighter for conveying coal or other materials to ships or wharves and having a movable bunker A and drop-keel B, the combination, with the said bunker and drop-keel, of the chains F and chain-drums E′ and the chains F^2 and chain-drums E^2, arranged to lower and raise the drop-keel as the bunker is raised and lowered, substantially as herein described.

4. In a lighter for coaling vessels or for conveying coal and other materials from vessels to wharves or other places, the combination, with the movable hopper or coal-bunker A and vertical guides fixed to the lighter for guiding said hopper, of an endless chain D, traveling on the bed of the hopper, and chutes C C′, pivoted to the hopper and serving to facilitate the discharge of the cargo, substantially as and for the purpose set forth.

MICHEL JOHN PAUL.

Witnesses:
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