

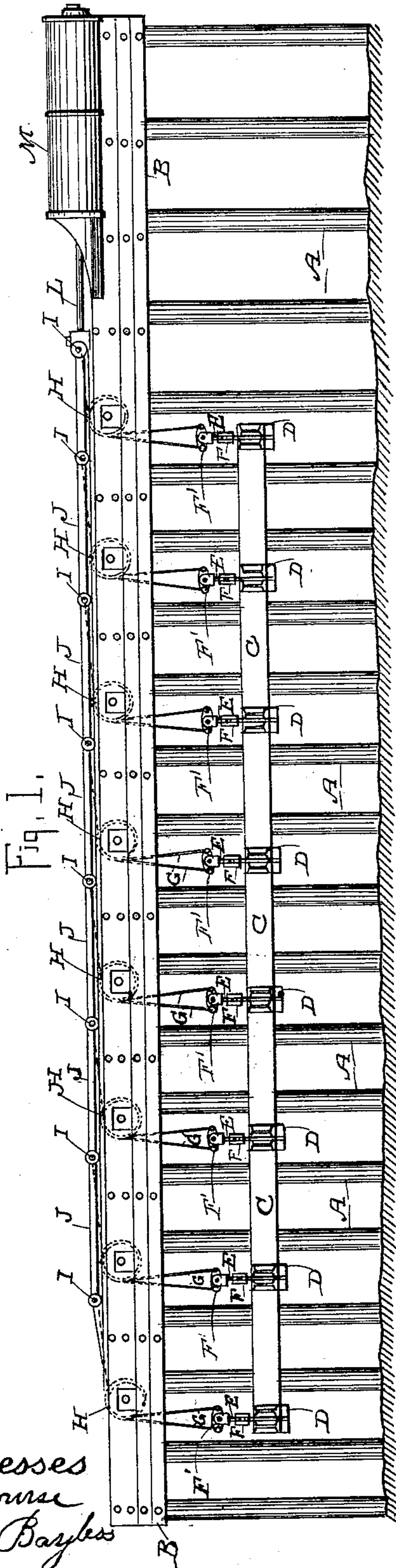
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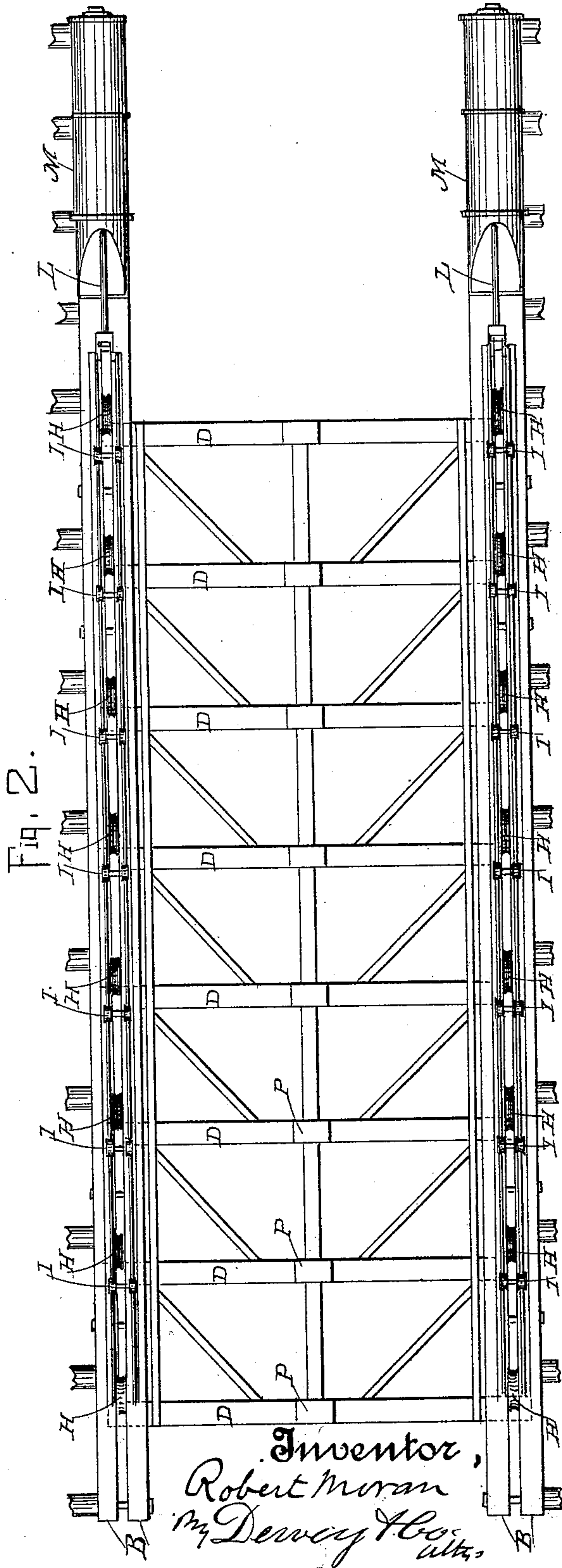
R. MORAN.
HYDRAULIC LIFTING DOCK.

No. 481,411.

Patented Aug. 23, 1892.



Witnesses
B. Brown
J. A. Bayless



Inventor,
Robert Moran
By Deroy H. Co. atty.

(No Model.)

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Fig. 3.

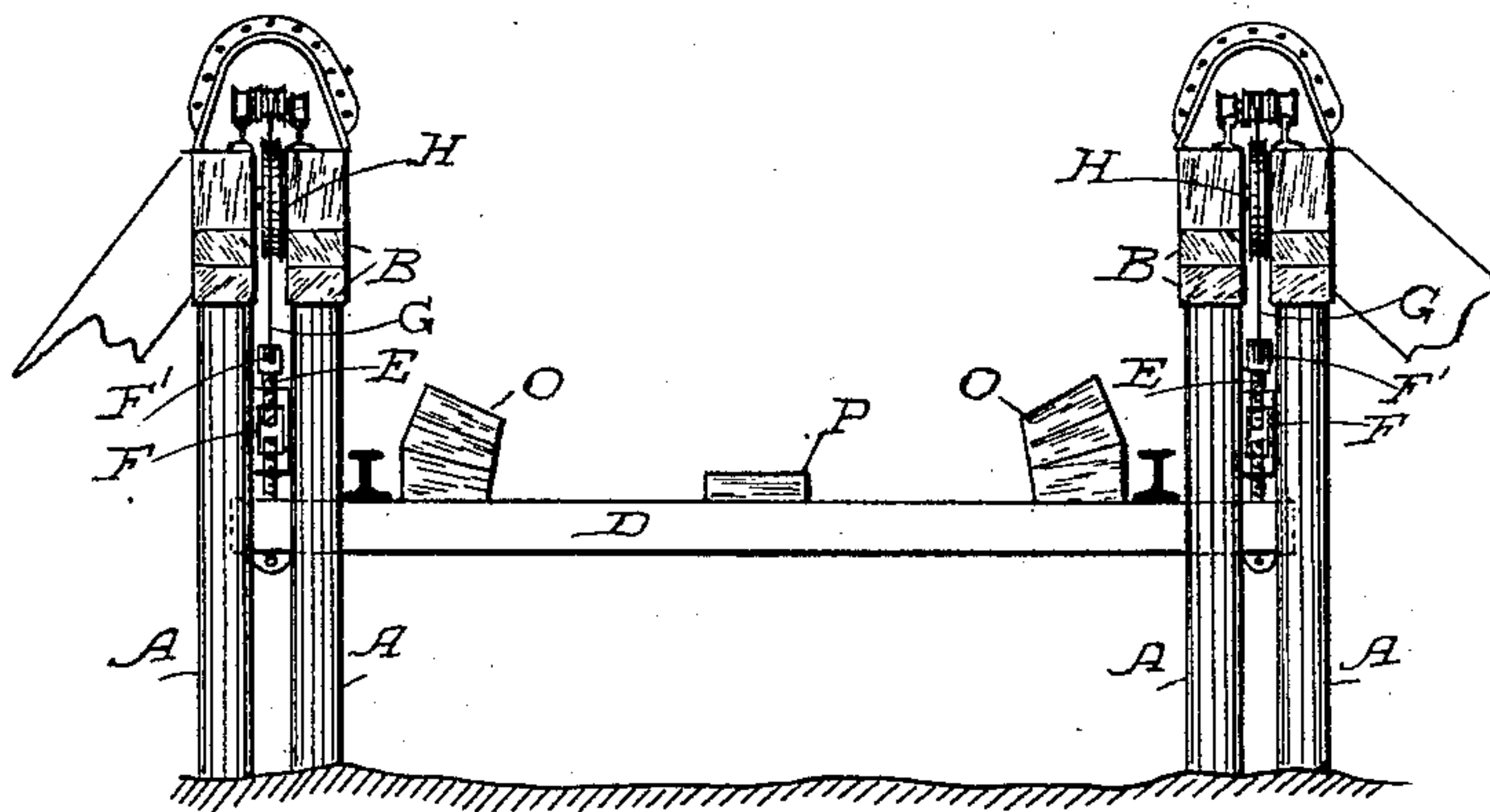
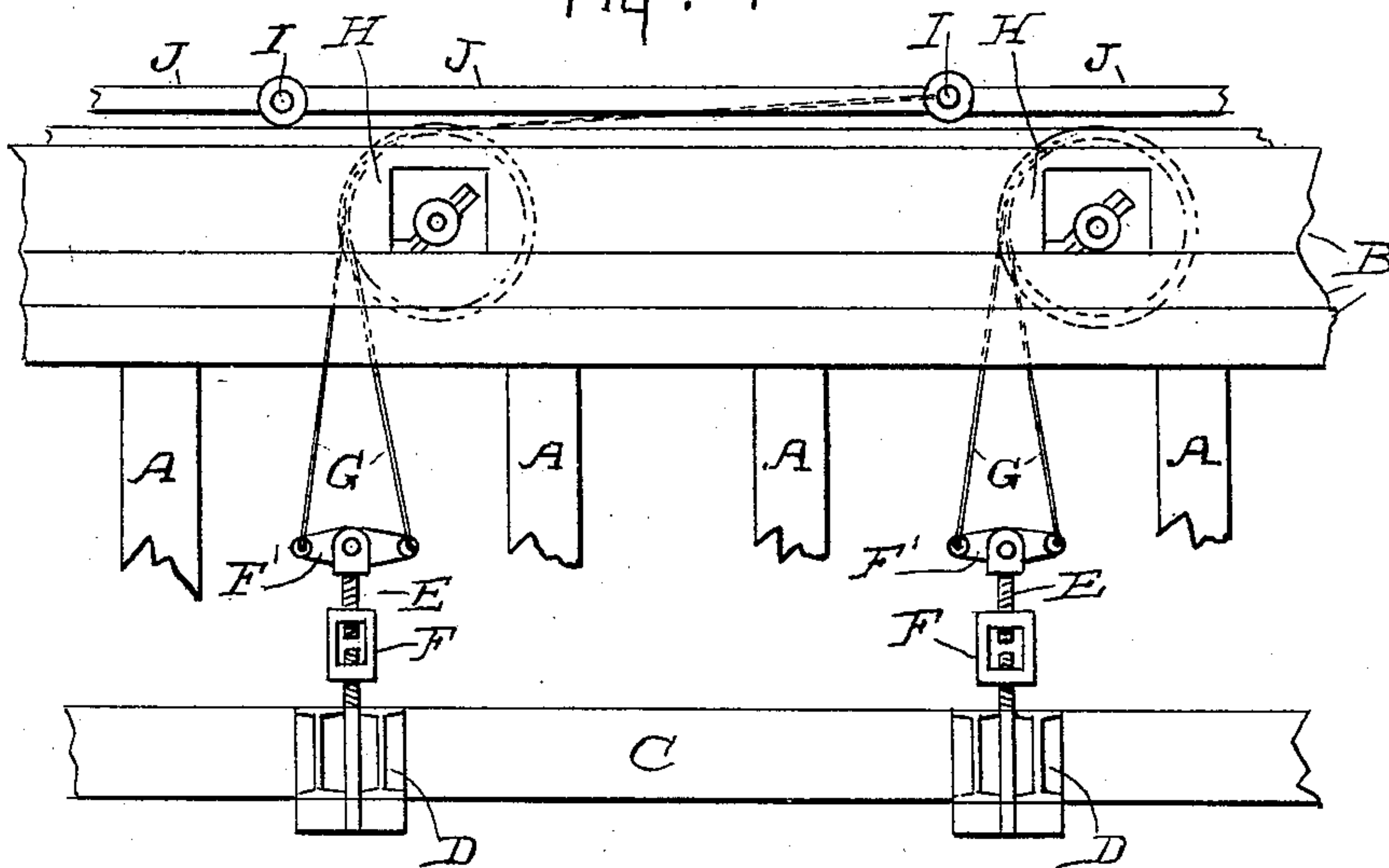


Fig. 4.



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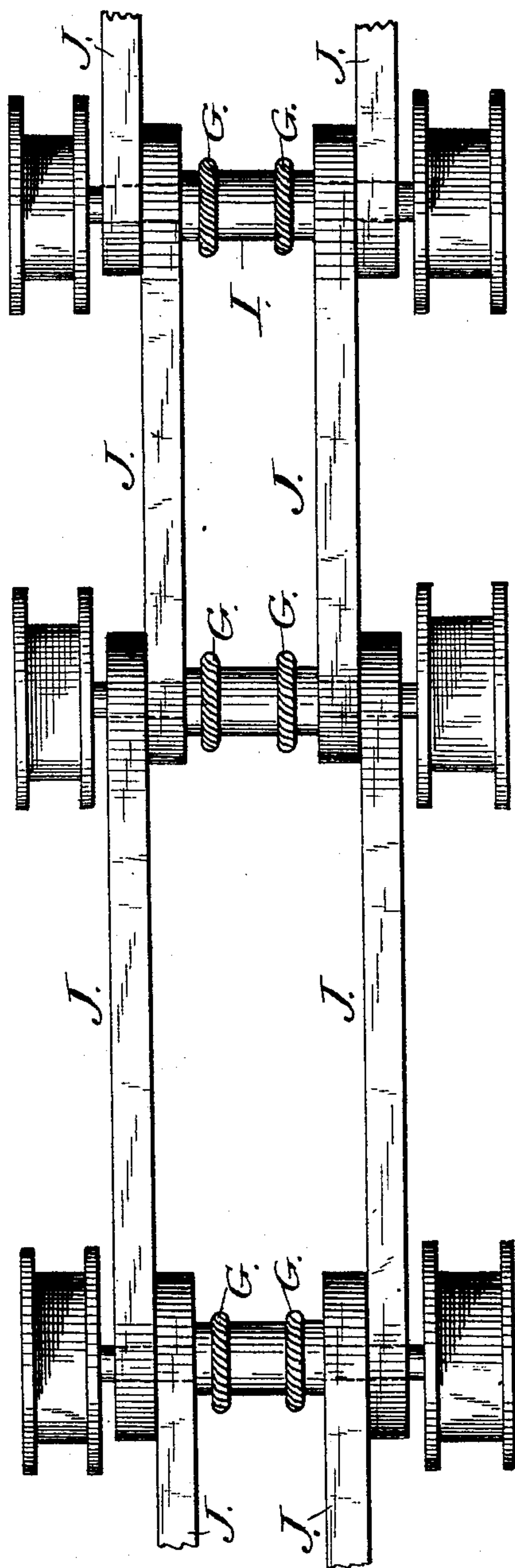
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Fig. 5.



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

ROBERT MORAN, OF SEATTLE, WASHINGTON.

HYDRAULIC LIFTING-DOCK.

SPECIFICATION forming part of Letters Patent No. 481,411, dated August 23, 1892.

Application filed March 16, 1892. Serial No. 425,173. (No model.)

To all whom it may concern:

Be it known that I, ROBERT MORAN, a citizen of the United States, residing at Seattle, King county, State of Washington, have invented an Improvement in Hydraulic Lifting-Docks; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improved hydraulic lifting-dock.

It consists in certain details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal side elevation. Fig. 2 is a plan view with the links omitted. Fig. 3 is an end view. Fig. 4 is an enlarged detail of a part of the side of the dock. Fig. 5 is an enlarged plan view of a portion of one side of the dock, showing in detail several of the links H and the pins to which the ropes G are connected in pairs.

The object of my invention is to provide a simple and economical device for lifting vessels out of the water and for other similar purposes. In the present case I have shown it applied in the construction of a lifting-dock, in which A A are the piles driven upon each side with caps at B.

C are the longitudinal, and D the transverse, girders of the lifting-platform. Upon each end of the transverse girders are the rods E, having turnbuckles F, by which they may be lengthened or shortened, so that when the whole device is suspended the girders may be properly leveled and any stretching or changing in the suspended parts may be compensated. To the upper ends of these bars are pivoted the equalizing-bars F' by stout pivot-bolts passing through the center. From the ends of these bars wire ropes G extend upwardly, passing over direction-pulleys H, and each pair of ropes is connected with a pin I in the end of a horizontal link J. These links are connected together, as shown in the enlarged detail, Fig. 5, and extend the whole length of the dock upon each side, and at the inner end they are connected with the piston-rod L of the hydraulic cylinder M. The cylinder M has a length equal to the full lift of the dock-platform. The links J are equal in length to the distance between the transverse girders of the platform, so that

each girder is suspended by a pair of ropes from the equalizing-lever and adjusting mechanism at its opposite ends, and each pair of ropes is connected with one of the links, as previously described. Any stretching or changing of length in these ropes is compensated by the equalizing-levers, and any lengthening of the whole device which would cause one girder to be lower than another is compensated by the turnbuckle. In this manner the whole platform of the dock is kept always in a level position. Water under pressure is admitted into the cylinders M in the usual way after the vessel has been floated into the dock and properly supported upon the keel and bilge blocks P and O, as shown in the end view. The vessel is then lifted as high as may be required for the purpose.

This device may be used for comparatively small docks. It may be used, also, as a transfer device to raise vessels which are afterward transferred bodily from the dock to a wharf or other position; and it may also be used in connection with locks to transfer vessels from one water-level to another.

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

1. In a lifting-dock, the combination of the horizontal cylinders having pistons reciprocating therein and mounted upon the sides and at one end of the dock, the link-rods extending along the sides of the dock, the movable dock-platform adapted to be raised and depressed between the sides of the dock, the pins I of the link-rods, the equalizing-bars, the suspending ropes or chains connected in pairs with said pins and connected with opposite ends of the equalizing-bars, guide-pulleys over which the ropes or chains pass, and the turn-buckles connecting the equalizing-bars with the girders, substantially as herein described.

2. In a dock, the stationary sides, the movable platform adapted to be raised and depressed between the sides, having transverse girders at equal intervals from one end to the other, suspending-rods connected with the opposite ends of each of the girders and turnbuckles by which the length is adjusted, horizontal equalizing-bars pivoted to the upper ends of said rods, suspending-ropes in pairs

connected with the opposite ends of the equal-
izing-bars, guide-pulleys over which the ropes
pass and by which their direction is changed
from vertical to horizontal, link-bars each
5 having a length equal to the distance be-
tween two adjacent girders of the platform,
connected together in continuous line and
adapted to travel upon the cap-timbers of the
sides of the dock, and horizontal hydraulic
10 cylinders fixed at one end having pistons and

piston-rods connected with the link-bars,
whereby motion is transmitted to lift all parts
of the platform simultaneously, substantially
as herein described.

In witness whereof I have hereunto set my 15
hand.

ROBERT MORAN.

Witnesses:

S. H. NOURSE,

J. A. BAYLESS.