

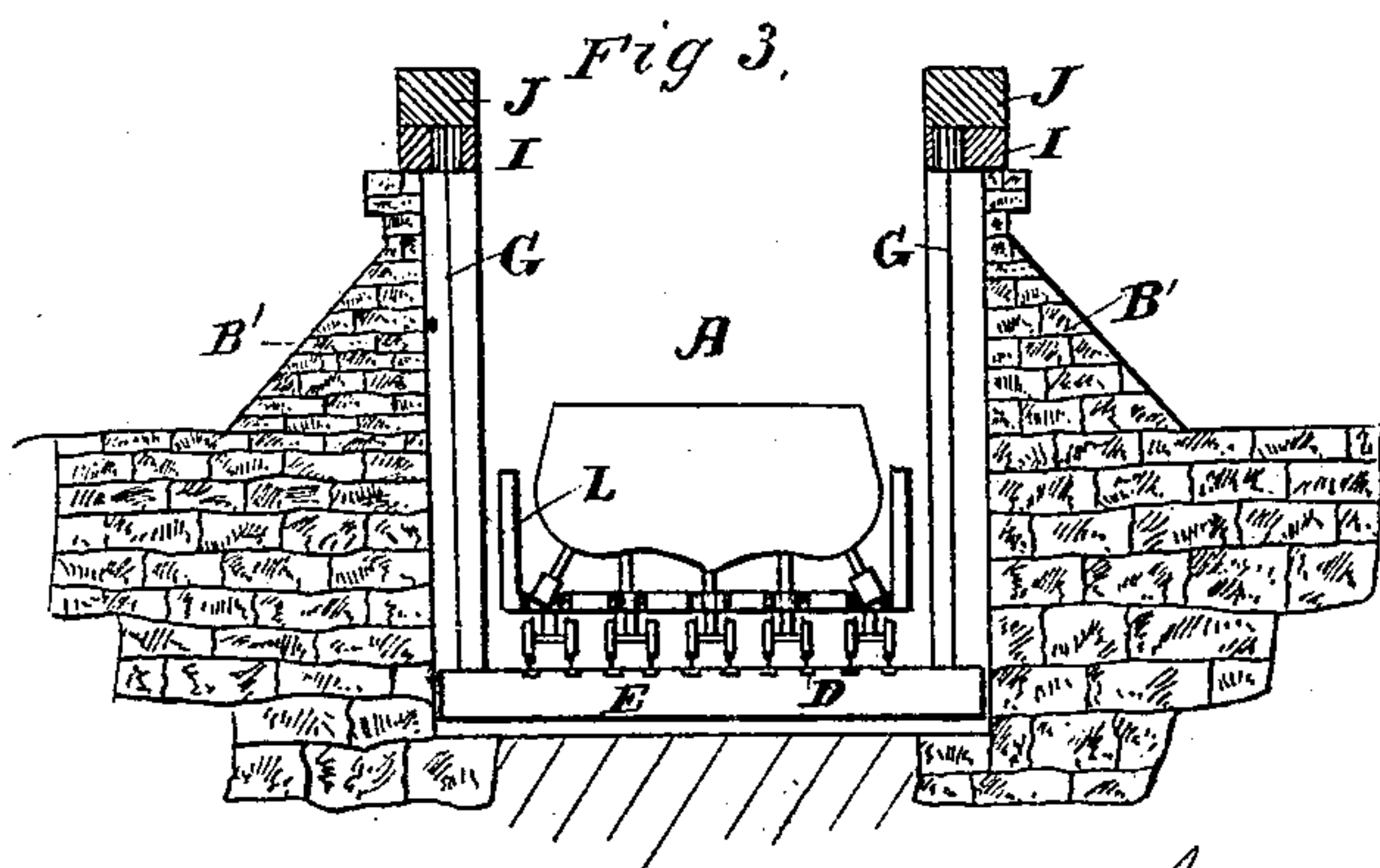
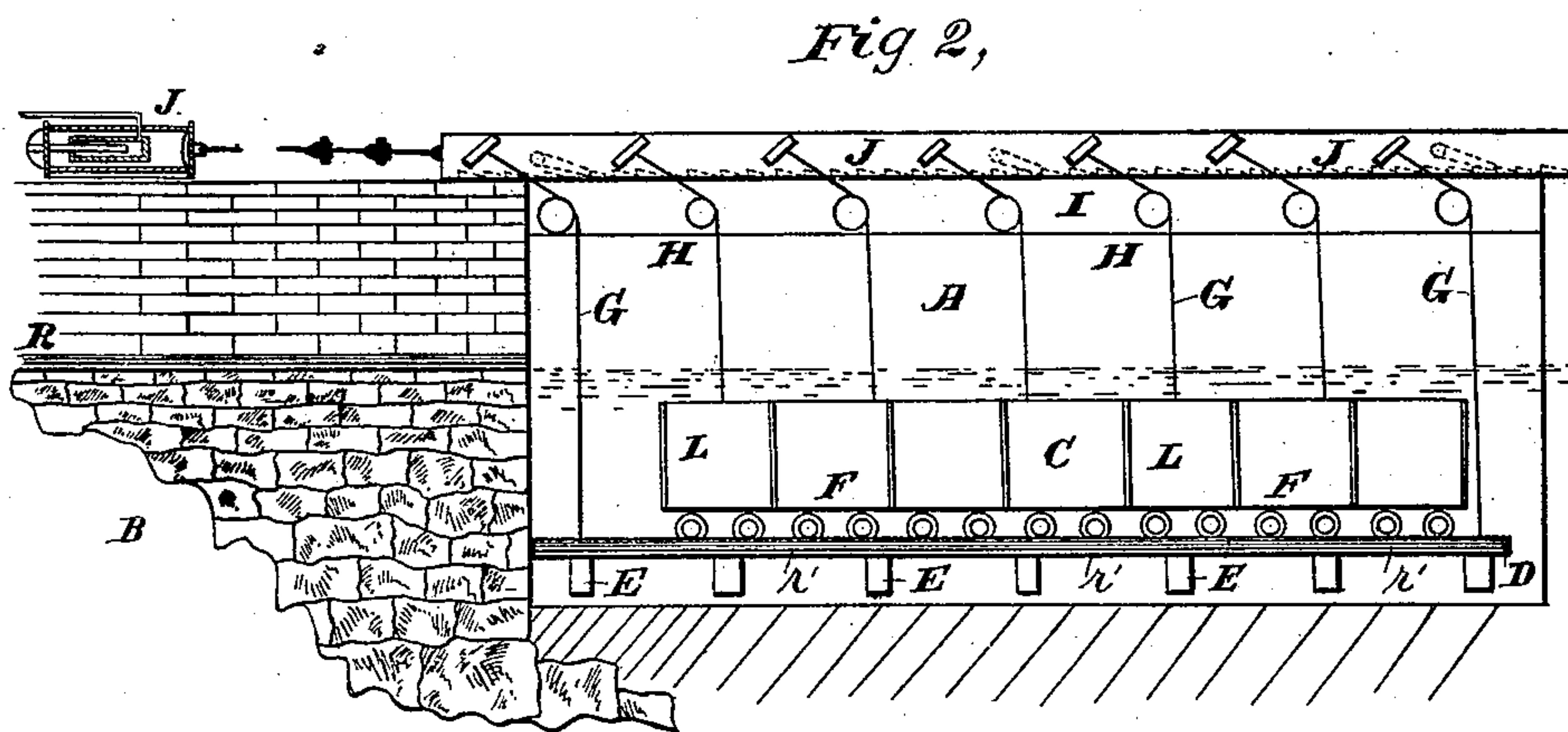
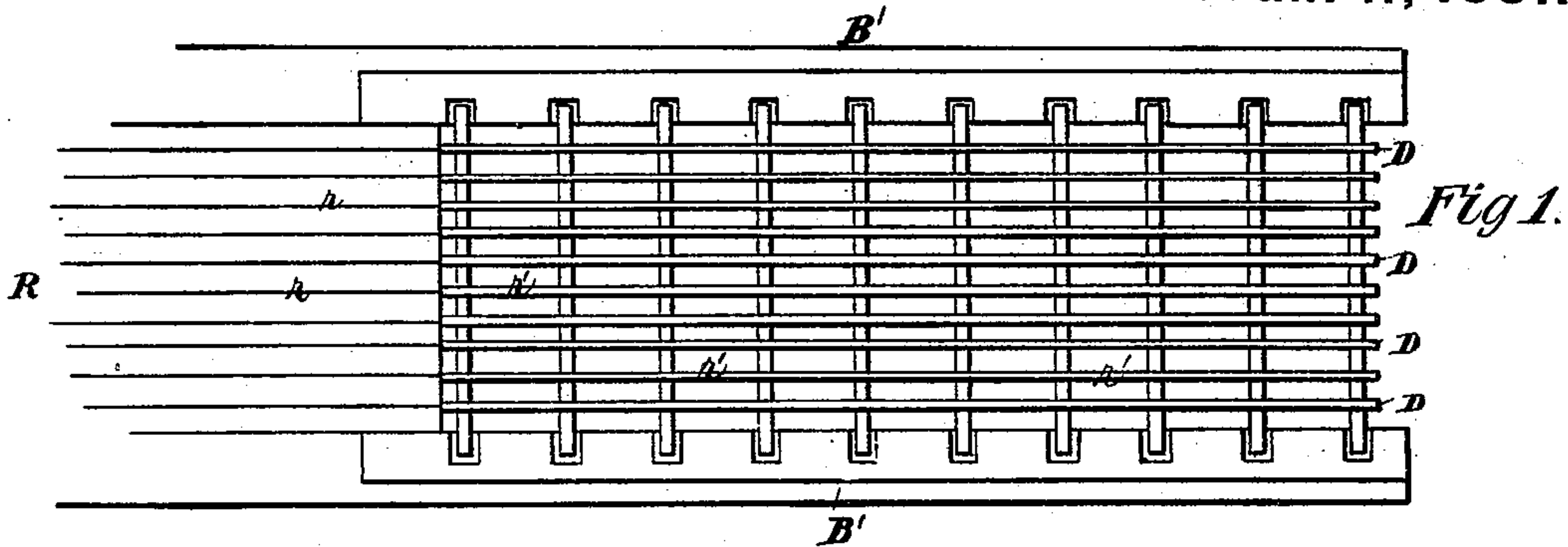
(No Model.)

2 Sheets—Sheet 1.

J. B. EADS.
Ship Railway.

No. 236,563.

Patented Jan. 11, 1881.



Attest:

Geo. T. Smallwood Jr
Walter Allen

Inventor:

James B. Eads
BY *Knights & Co*
attys

(No Model.)

2 Sheets—Sheet 2.

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Fig 4.

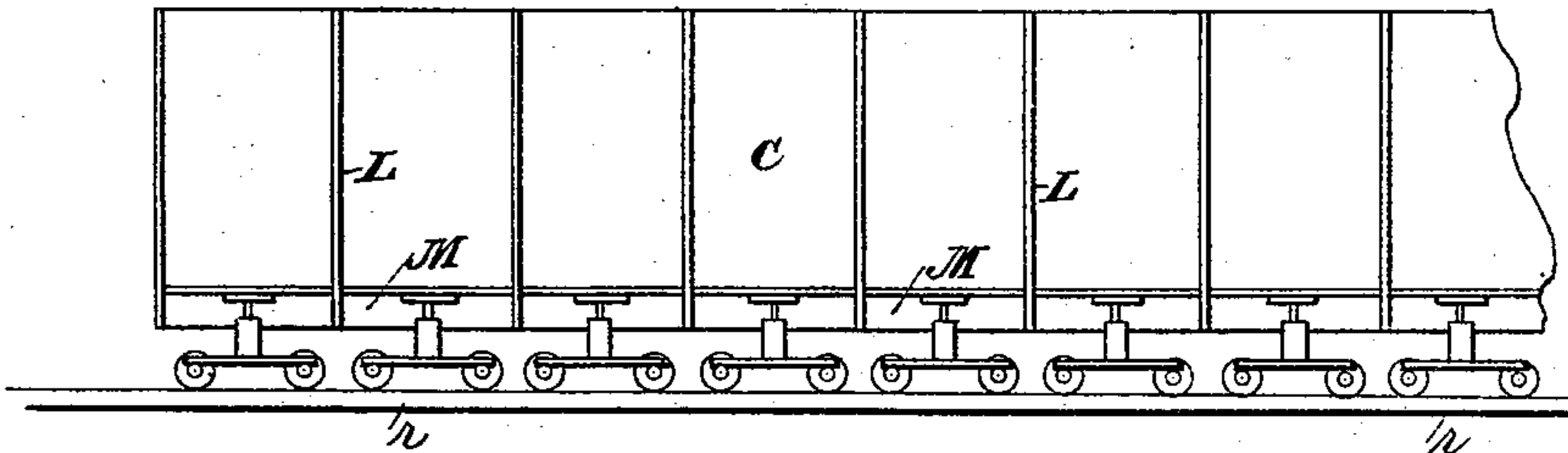


Fig 5.

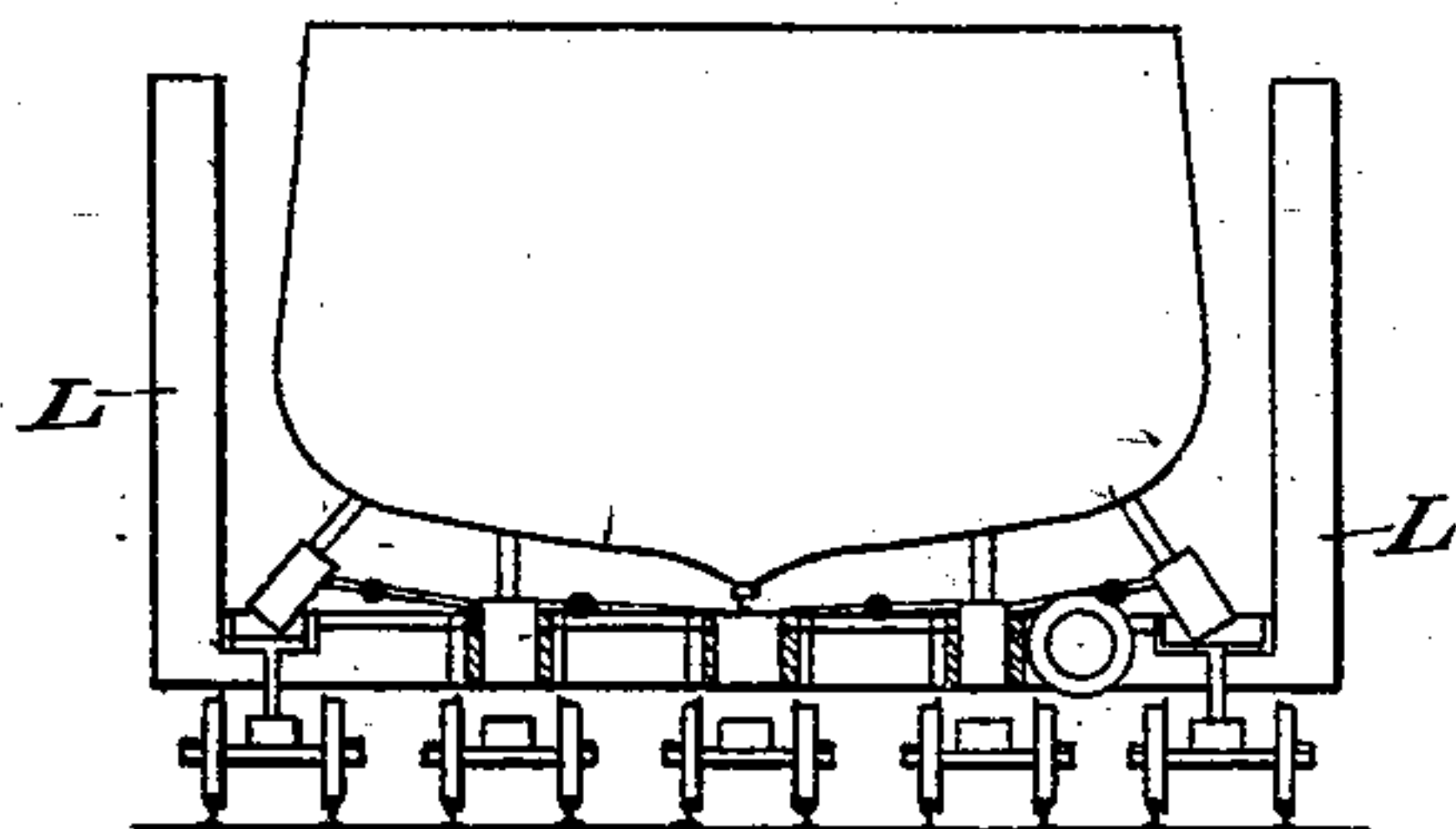


Fig 6.

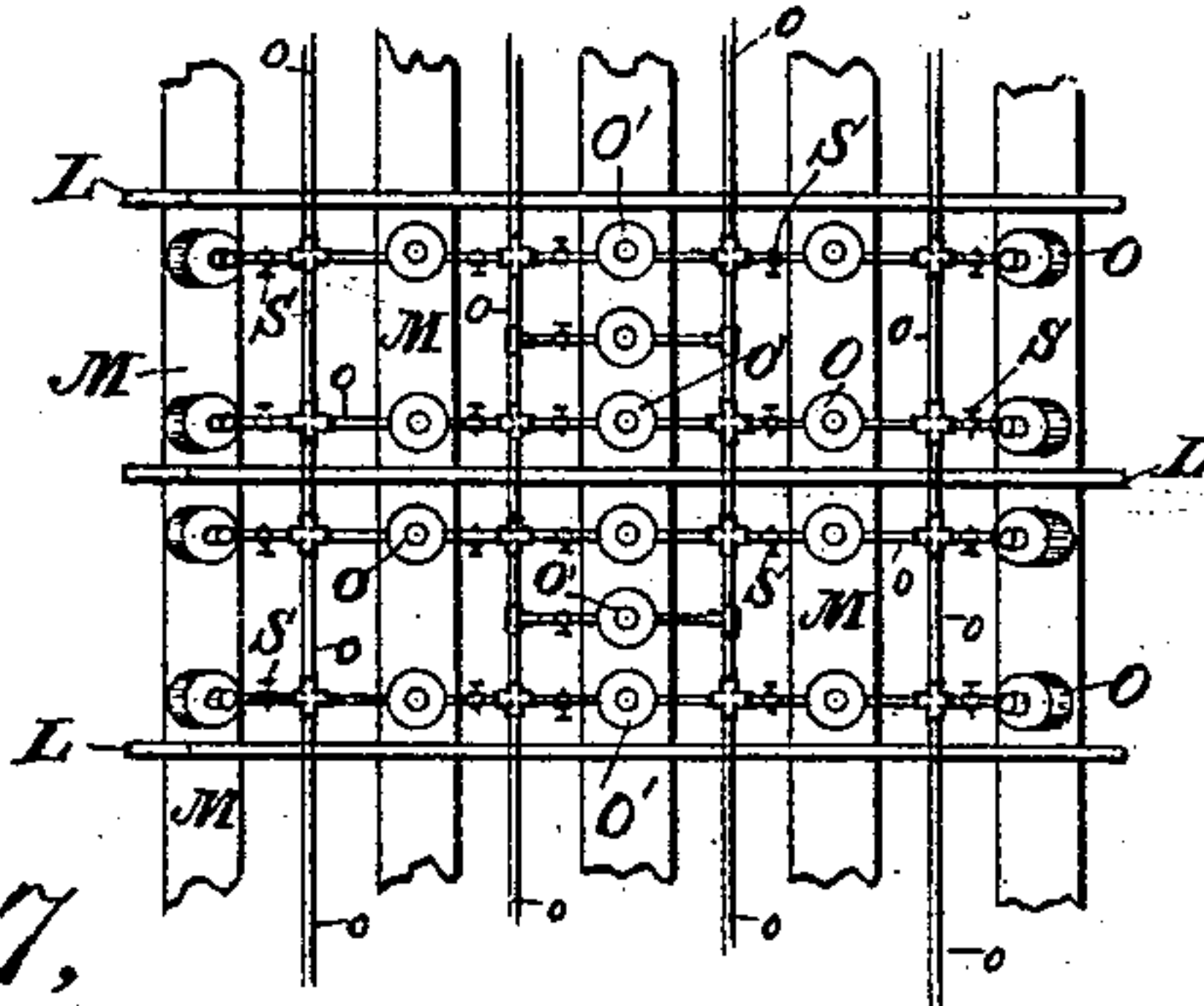


Fig 7.

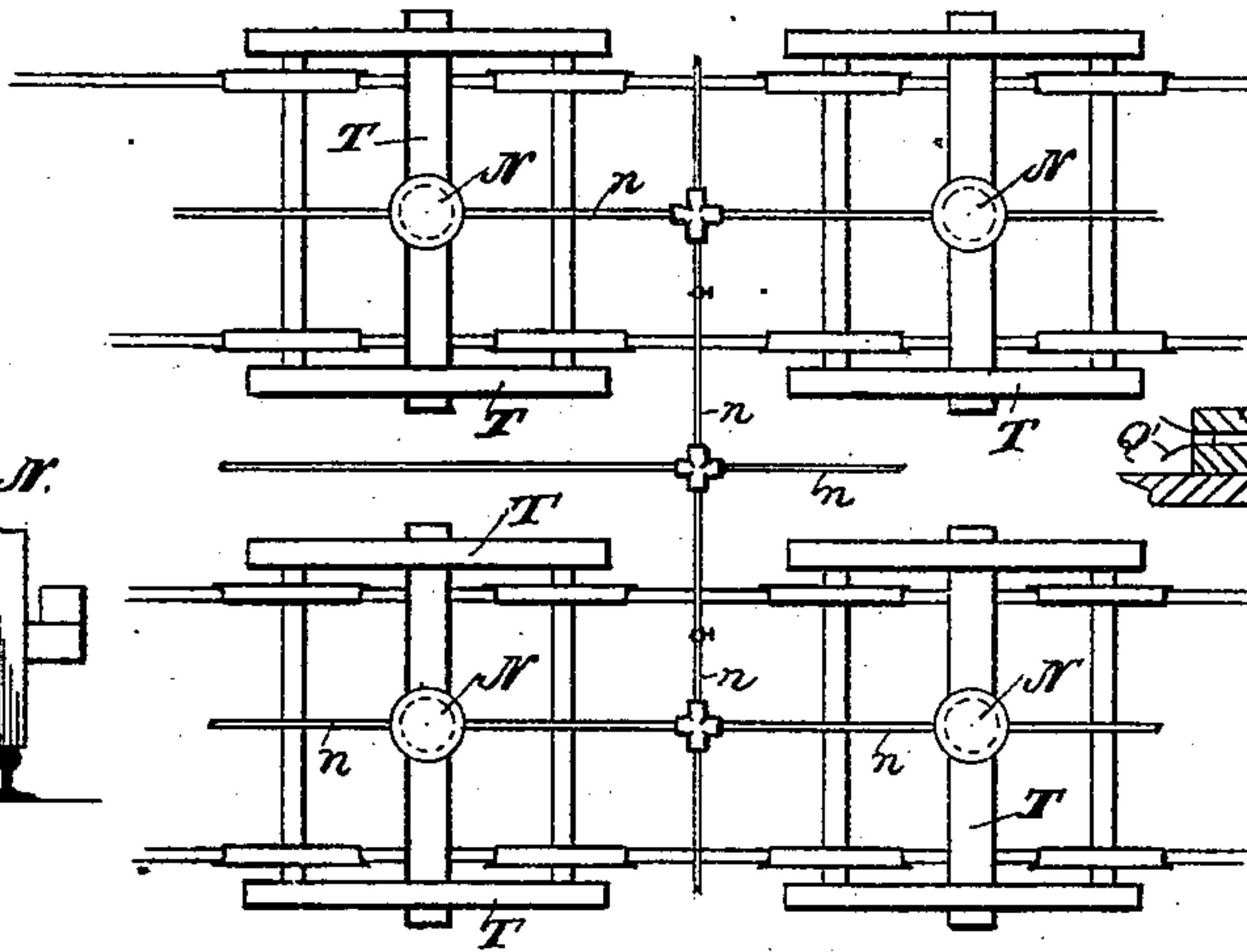


Fig 9.

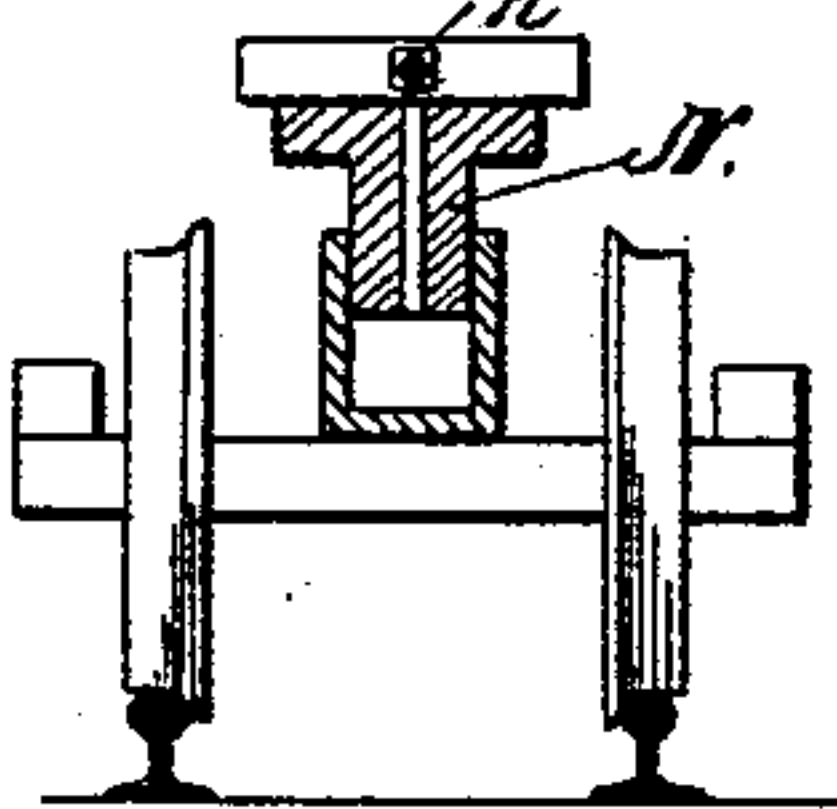


Fig 10.

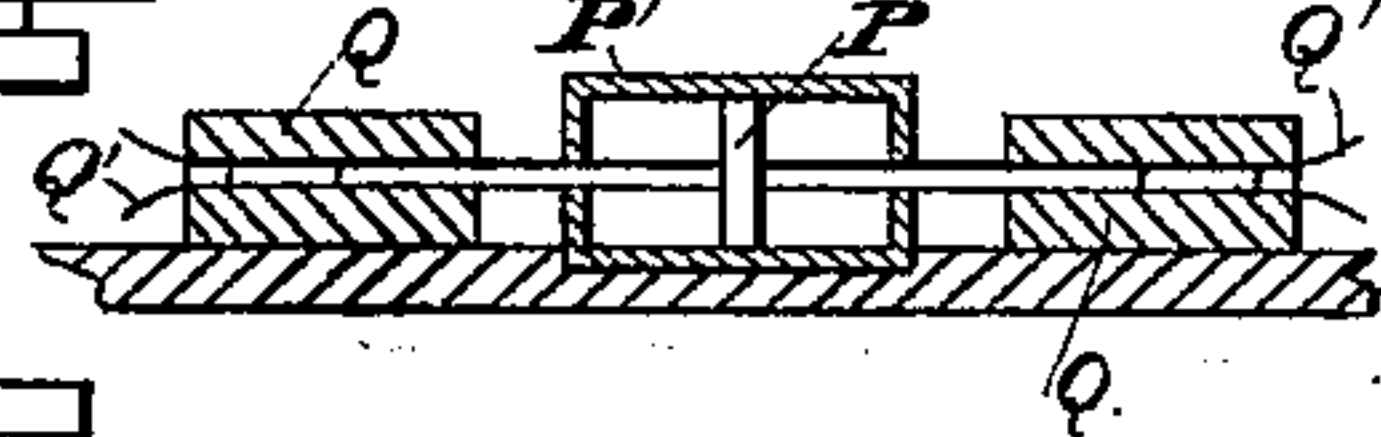
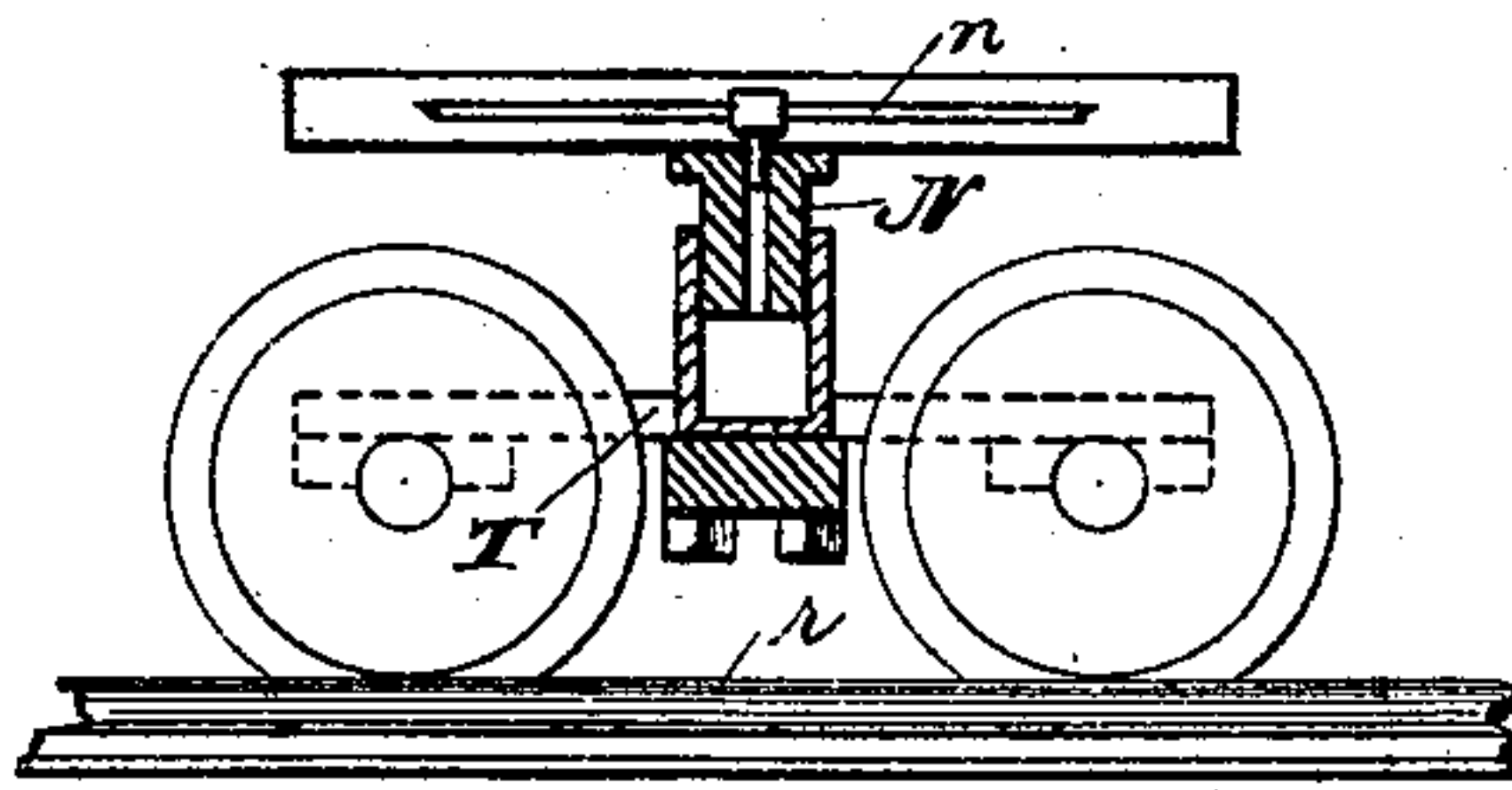


Fig 8.



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UNITED STATES PATENT OFFICE.

JAMES B. EADS, OF ST. LOUIS, MISSOURI.

SHIP-RAILWAY.

SPECIFICATION forming part of Letters Patent No. 236,563, dated January 11, 1881.

Application filed May 8, 1880. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. EADS, of the city of St. Louis, in the State of Missouri, have invented new and useful Improvements in Ship-Railways and Cars Therefor, of which the following is a specification.

The general object of my invention is to provide means for safely transferring a loaded vessel overland from one navigable water to another.

My invention consists in the combination, in a ship-railway car and cradle, of a system of hydraulic jacks to afford stable and uniform support to all parts of a ship's bottom, and a connected system of hydraulic jacks to compensate for irregularities in the track and prevent local strains on any part of the cradle.

In the accompanying drawings, Figure 1 is a plan of the lifting-dock and railway. Fig. 2 is a longitudinal section of the same. Fig. 3 is a transverse section thereof. Fig. 4 is a side elevation of the cradle. Fig. 5 is a transverse section of the same. Fig. 6 is a plan of a portion of the cradle. Fig. 7 is a plan of four trucks, showing the jacks to support the cradle. Fig. 8 is a longitudinal section of one of the trucks on a larger scale. Fig. 9 is a transverse section of the same. Fig. 10 is a longitudinal section of a pump.

Referring to Figs. 1, 2, and 3, A represents a dock, within which a vessel may be floated over a suitable cradle, C, hereinafter more particularly described.

B represents a body of masonry, forming one end of the dock and supporting a multiple railway, R, which may be constructed with ten parallel rails, as shown.

Beneath the cradle C are longitudinal girders D, constituting stringers, on which are fixed rails *r'* for supporting the truck-wheels F F of the cradle C.

Beneath the longitudinal girders D are transverse girders E, the ends of which project within vertical recesses in the side walls, B', of the dock.

G G represent chains, attached at their lower ends to the extremities of the transverse girders E, and extending upward over sheaves A, having their bearings in longitudinal beams I, which are securely supported on the walls B', and have a firm end bearing against the mason-

ry B. The upper extremities of the chains are fixed to longitudinal sliding beams J J, supported on suitable rollers and moved endwise by means of hydraulic jacks K K, for the purpose of lifting the vessel bodily to a sufficient height to bring the rails *r'* of the lifting apparatus on a level with the rails *r* of the permanent railway, and thus permit the cradle supported on the wheels F F to be transferred to the said permanent railway.

My combined car and cradle for ship-railways is divided transversely into sections, any number of which are used, as may be demanded by the length of the ship. Each section consists of a number of girders, L L, extending transversely beneath the ship's bottom and vertically to a sufficient height on each side, and longitudinal beams or girders M M, connecting the said transverse girders L L. The cradle-sections thus formed rest on the truck-frames T T through the medium of a system of hydraulic jacks, N N, connected by pipes *n n*, so as to allow relative vertical movement of the truck-frames, and thus compensate for irregularities in the height of the rails. Upon the girders L M, which constitute the base-frame of the cradle C, are hydraulic jacks O and O', arranged in three or more longitudinal tiers. The central jacks, O O, support the keel of the vessel, while the side jacks, O' O', support the bilge. The jacks O and O' are connected by pipes *o* throughout the entire system; hence it will be seen that the pressure on all the parts of the ship's bottom is equalized, and my improved cradle adapts itself automatically to the bottoms of vessels of various shapes with the desired equalized and uniform pressure. Stop-cocks or valves S S are employed to confine the water within the jacks and thus fix the plungers in the positions which they have assumed, so as to make the uniform support stable and unyielding.

Any suitable force-pump may be employed for applying the required hydraulic pressure to the jacks. A suitable double-acting pump is shown in Figs. 5 and 9, where P is a central piston working in a steam-cylinder, P', and Q Q water-pistons at the respective ends of the steam-piston rod, serving to force water out of the pump-cylinders Q' Q' in succession by the alternate movement of the steam-piston.

The operation of the apparatus is as follows: The elevator or track-frame D E and cradle C, with the jacks O O' retracted, being lowered within the dock A, the vessel is floated over the cradle, the elevator raised until parts of the cradle chocks or jacks come in contact with the ship's bottom. Pressure is then applied simultaneously to all the jacks O O', so as to establish a uniform pressure under all parts of the bottom. The stop-cocks or valves S S are then closed, so as to lock the plungers firmly in position while the vessel is still afloat. The whole is then lifted bodily by the action of the jacks K K until the rails r' reach the level of the permanent track R. The combined car and cradle carrying the vessel is then run on the said track and transported to any desired distance overland, the vessel being sustained with little or no more strain than when afloat. On arriving at the other end of the

line she is replaced in the water by means of a similar apparatus.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

A ship-railway car and cradle constructed with a connected system of hydraulic jacks having stop-cocks or valves, to apply supports automatically with uniform pressure to all parts of a ship's bottom simultaneously and lock them in the positions in which they are thus set, and with a connected system of hydraulic jacks beneath the supporting bed or cradle to compensate for vertical irregularities in the track.

JAS. B. EADS.

Witnesses:

WALTER ALLEN,
HARRY E. KNIGHT.