

(No Model.)

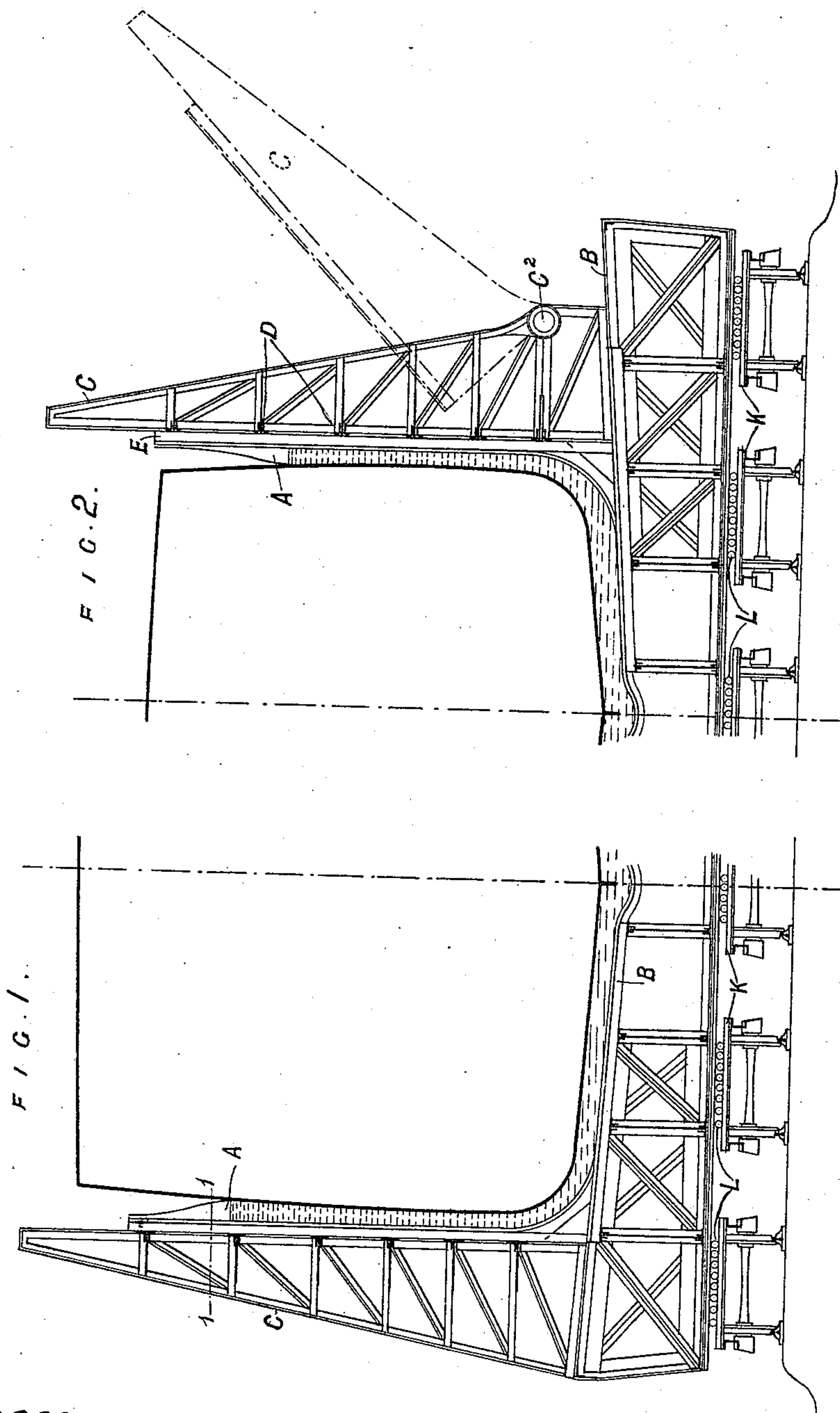
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W. SMITH.

CAR FOR THE CONVEYANCE OF SHIPS ON SHIP RAILROADS.

No. 430,353.

Patented June 17, 1890.



Witnesses.
G. Sedgwick
J. H. Pitter

Inventor
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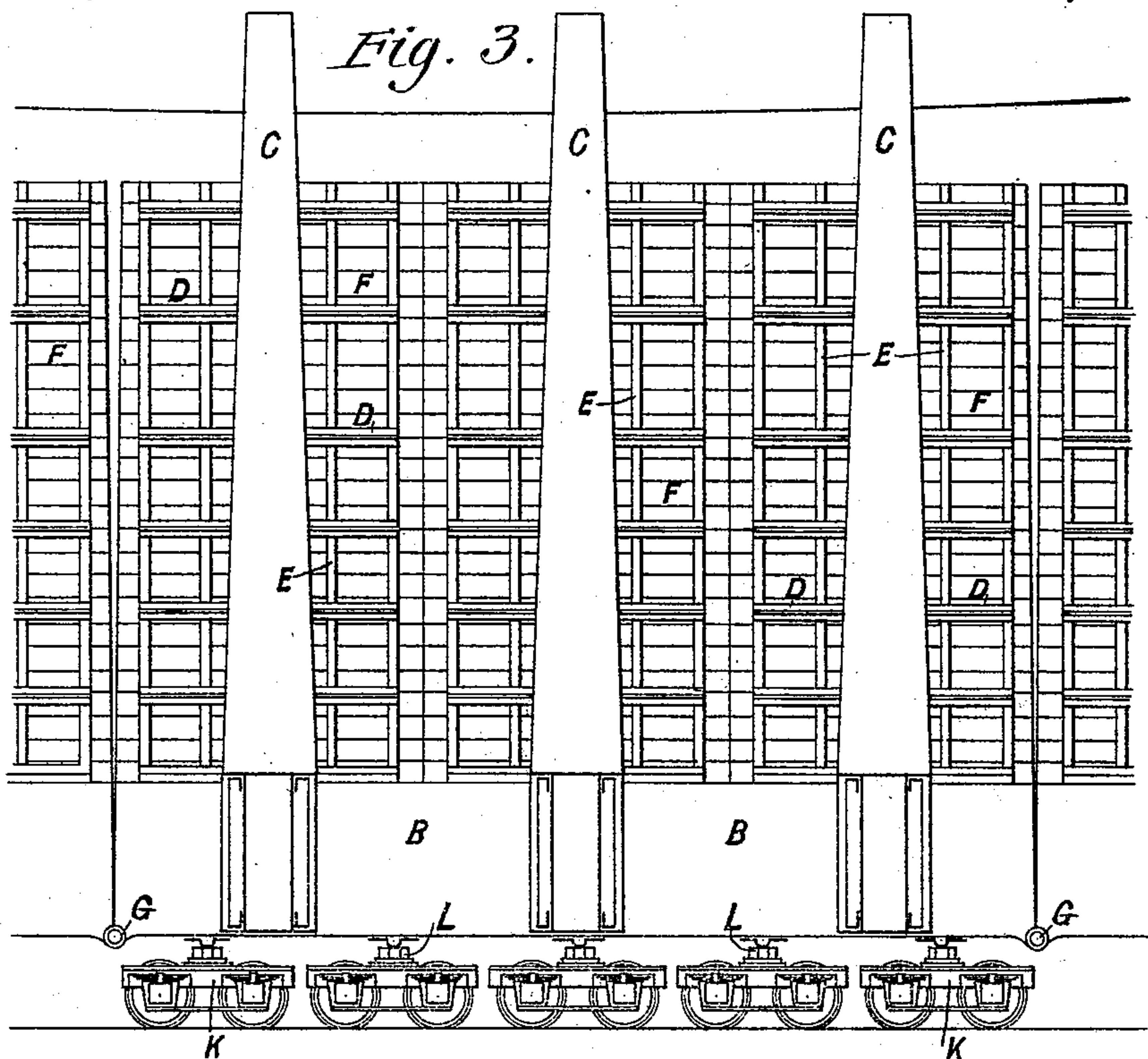


FIG. 4.

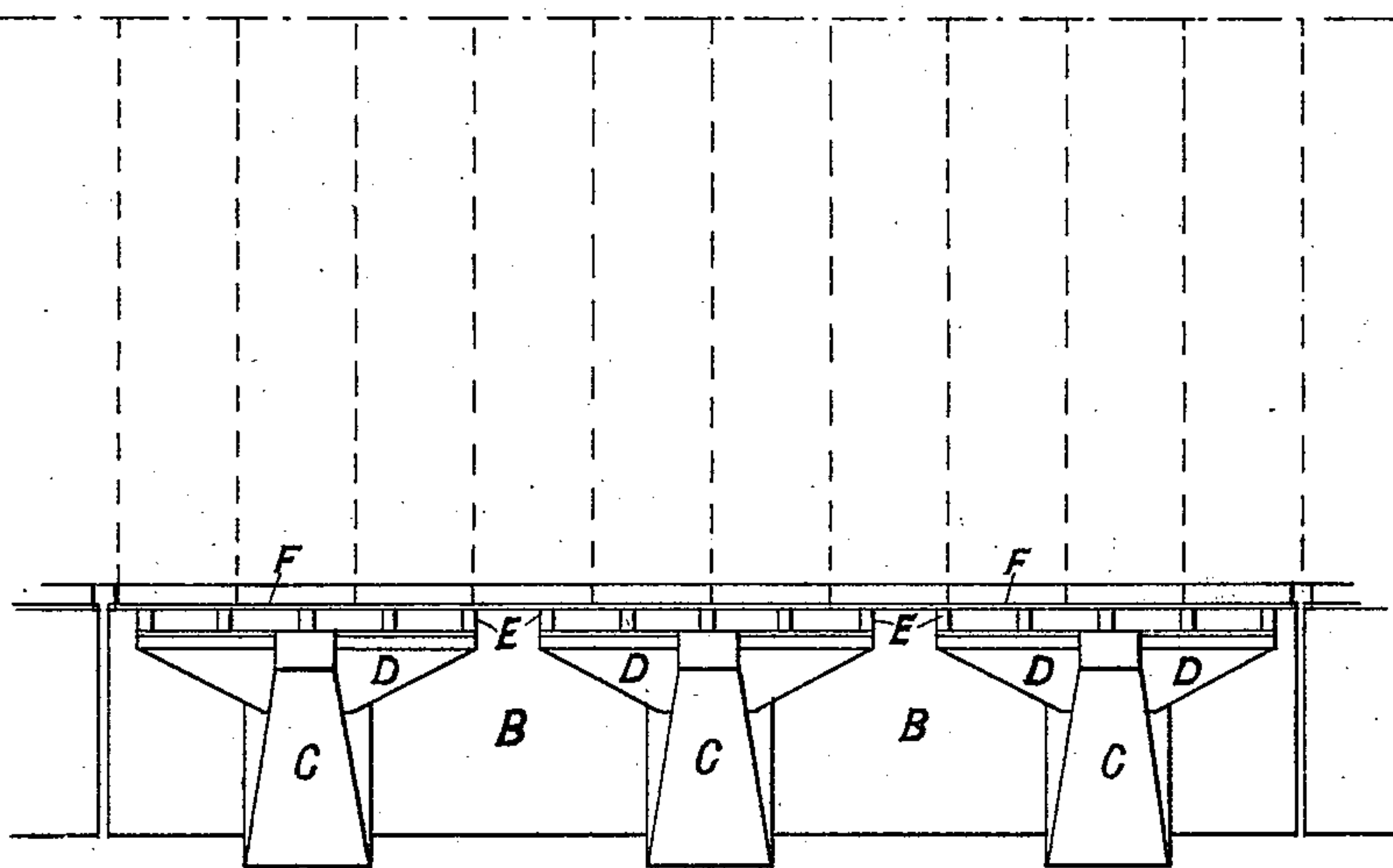
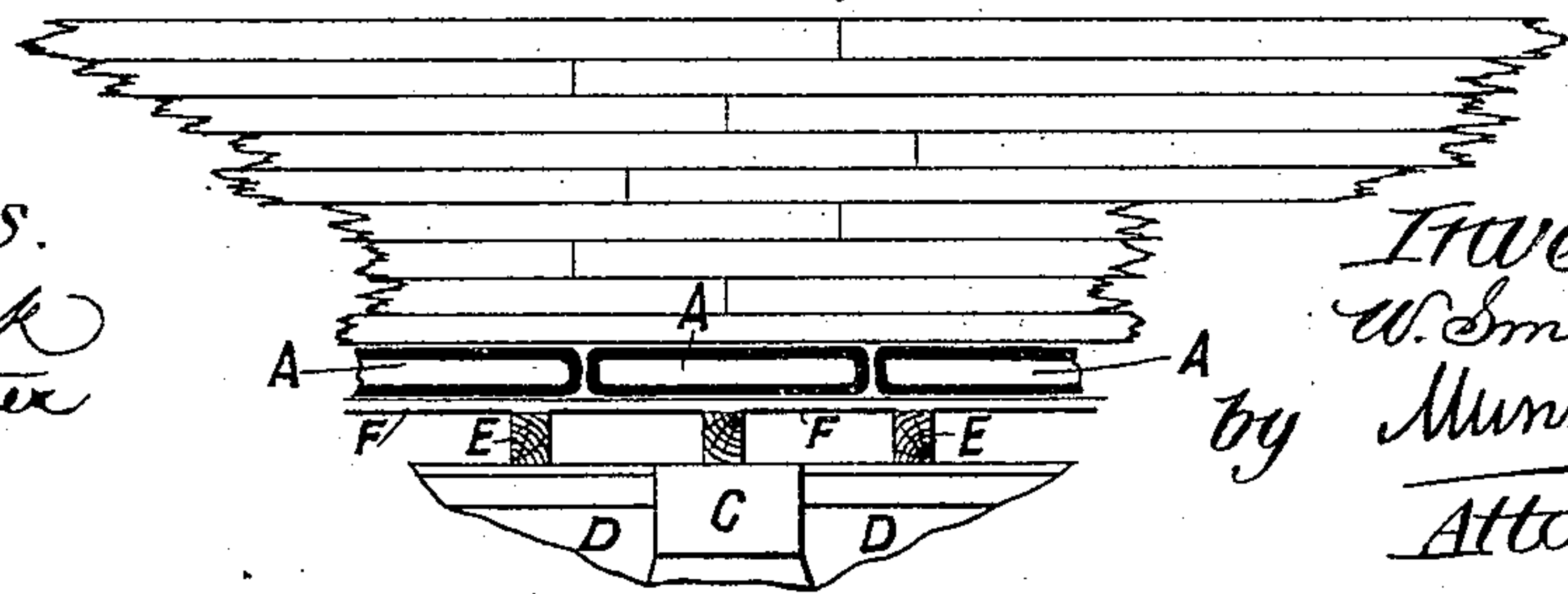


FIG. 7.



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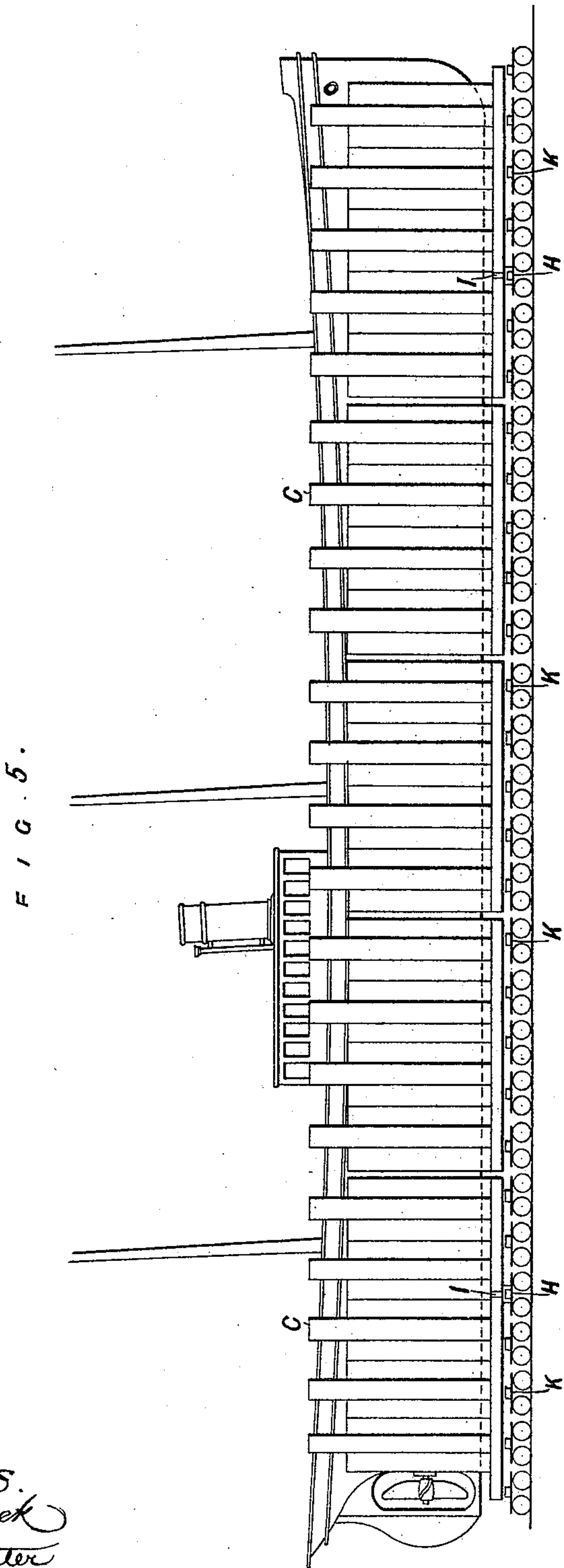
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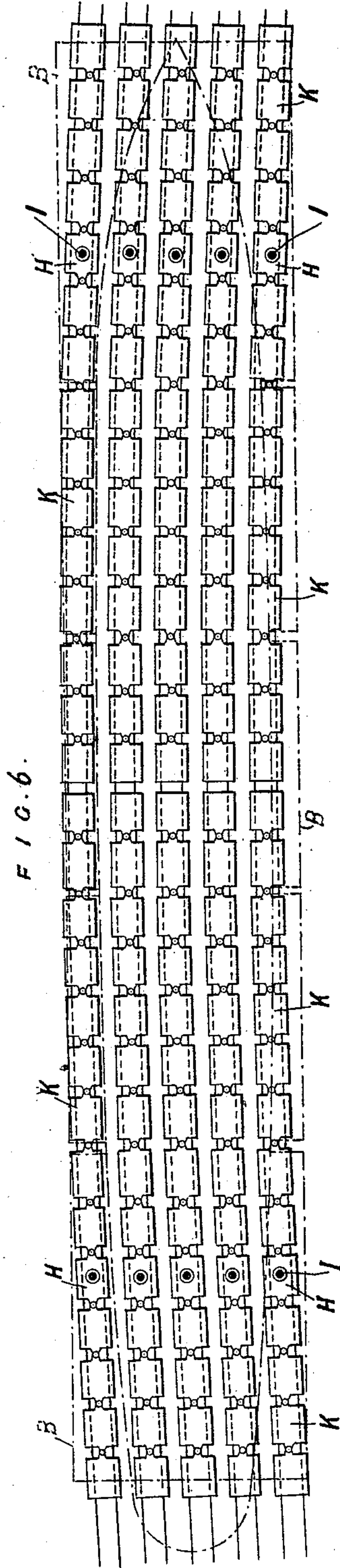
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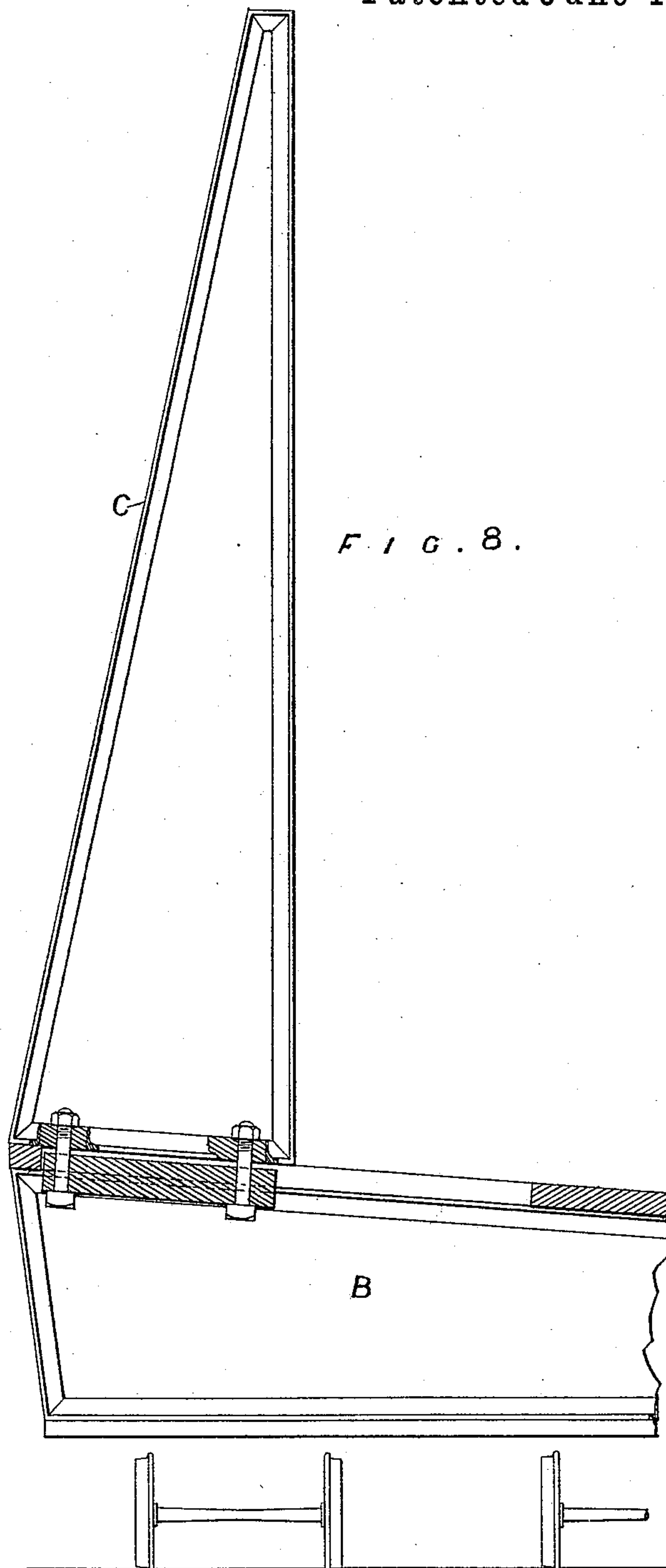
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WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM SMITH, OF ABERDEEN, COUNTY OF ABERDEEN, SCOTLAND.

CAR FOR CONVEYANCE OF SHIPS ON SHIP-RAILROADS.

SPECIFICATION forming part of Letters Patent No. 430,353, dated June 17, 1890.

Application filed November 20, 1889. Serial No. 331,019. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SMITH, engineer, of No. 15 Regent Quay, Aberdeen, Scotland, have invented new and useful Improvements in Cars for the Conveyance of Ships on Ship-Railways, of which the following is a full, clear, and exact description.

My invention relates to the conveyance of ships on what are known as "ship-railways;" and it has for its object to provide a car whereon the ship will be practically waterborne in such a way as to admit of the necessary flexibility of the car in the vertical direction to enable it to accommodate itself to changes of gradient without causing any undue strain on the vessel in passing from one gradient to another, and likewise sufficient lateral flexibility of wheel base to admit of the car following curves or changes of direction of the line.

The invention consists, essentially, of a series of hydraulic cushions formed of flexible and compressible U-shaped tubes lining the sides and bottom of a cradle-like superstructure of the car and containing water, the weight of the vessel when seated on these cushions being counterbalanced by the hydrostatic pressure of the columns of water in the vertical members of the tubes, these columns of water collectively forming what may be termed a "film" of water, of which the weight forms but a small percentage of the total weight to be carried.

The invention further comprises the cradle-like superstructure above referred to, whereby the hydrostatic cushions are supported, said structure being formed of U-shaped sections, each of a width and shape to correspond to the cross-sectional outline of the part of the ship to which it is to be applied, and each adjustable to suit ships of different breadths, the several sections being connected to one another by transverse hinges at the base, so as to maintain an invariable distance apart, while permitting flexure of the series in the vertical plane.

The invention further consists in the combination, with such series of hinged sections, of a wheel-base, composed for each pair of rails of two sets of trucks together extending

the whole length of the car, the trucks of each set being coupled together, so as to maintain an invariable distance apart, while permitting free swiveling or lateral motion guided only by the wheel-flanges against the rails, one truck only of each set being connected to the superstructure by a center pin. There are as many pairs of sets of trucks as there are lines of track for the car to run on, and the only connection between the different sets of trucks, whether running on the same or different tracks, is through the center pins and superstructure.

I will proceed to describe the details of construction of my improved ship-car with reference to the accompanying drawings, forming part of this specification, wherein—

Figure 1 is a half transverse section of the ship-railway car at its maximum breadth of beam, while Fig. 2 is a similar view showing the upright side members as adjusted for a narrow part of the hull of the same vessel or another vessel of less breadth of beam. Fig. 3 is a side elevation of one of the sections of the ship-car, and Fig. 4 is a half plan of the same. Figs. 5 and 6 are diagram elevation and plan showing the ship supported on the car. Fig. 7 is a section on line 1 1, Fig. 1; and Fig. 8 shows details of the connection of the adjustable side members of cradle to their base or platform.

The same letters of reference indicate the same parts in all the figures.

A are the tubes containing the hydrostatic cushions. They are plain straight tubes made of several plies of rubber-coated canvas cemented together, woven-canvas hose-pipe or other water-tight flexible material, and when applied to the cradle or superstructure of the car they are bent up to the U form shown. They are not permanently connected in any way to the cradle except on the bottom of the cradle at or near the center line thereof, but lie in position therein by their own weight, or confined within netting attached to the car in order to admit of the lateral adjustment of the cradle to suit the breadth of the hull. They are of sufficient length to rise up to about the height of the bulwarks of the broadest vessel the car is able to receive.

They are open at the ends, and while compressed under the weight of the vessel they abut closely together beneath the bottom and at the sides of the hull. They may be of diminishing cross-sectional area toward their ends, where they are not required to afford lateral support for the vessel, the hydrostatic pressure by which the weight of the vessel is counterbalanced being dependent only on the height of the column of water and equally great, however small may be its cross-sectional area. Being open at the ends, the tubes cannot be exposed to such excessive pressure as would cause them to burst. The cradle-like superstructure, of which these tubes form the lining, is composed of sections, each section being constituted by a base or platform B and by one or more pairs of upright members C C, (there being in the example illustrated three pairs of such uprights to each platform B,) the members B C C being of girder-like steel framing with a tubular lining, and together constituting a U-shaped section adapted to embrace the hull of the vessel. The platform B extends the full width of the car, and the upright members at both sides are mounted to slide thereon in the transverse direction in order that the width between them may be adjusted to suit the breadth of the hull, the uprights being fitted to slide in guides in the base B and bolted securely in position after adjustment, as shown in Fig. 8. The upright members at one or both sides are hinged, as at C² in Fig. 2, to allow of the ship being easily floated into position in the cradle, said hinged members being operated by any suitable tackle and fixed rigidly in their upright position after the ship has been received in the cradle. The guide-like uprights C C have their inner faces broadened by horizontal or cross members D, against which are bolted vertical joists E, which in turn are faced by planking F, forming a continuous surface for the support of the hydrostatic tubes A. The upper surface of the base B is sloped downward toward the center to correspond approximately to the outline of the bottom of the vessel, a central depression being provided to receive the keel. The sections are hinged together by transverse hinges G, by which any required number of sections may be flexibly coupled together to suit the length of the vessel.

H are the bogie-trucks, connected to the bases B of two of the intermediate sections by center pins I. K are trucks coupled to the bogie-trucks, and otherwise wholly disconnected from the superstructure, which rests on them, through the medium of rollers L, which allow of the necessary lateral movement of the trucks beneath the superstructure when running on curves.

For the purpose of placing a ship on the car, the rails of the railway would be contin-

ued down a submerged slipway in the wet-dock, down which the ship-car would be run under water after having been made up to the proper length and otherwise prepared for the reception of the ship, the horizontal part only of the cushions being already filled with water. The ship having been floated into proper position, the car is run beneath it. The ship having been made fast to the car, the latter is hauled up with the ship on it, the vessel as it leaves the water gradually settling on the hydraulic cushions, neither the vessel nor the car requiring further adjustment.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a ship-carrying railway-car, the combination, with a U-shaped cradle or superstructure, of hydrostatic cushions lining said cradle and formed of juxtaposed tubes of compressible material extending across, beneath, and up the sides of the vessel, said tubes containing water and being open at the top and serving as a water-bed whereon the weight of the vessel is floated or counterbalanced by hydrostatic pressure, substantially as specified.

2. In a ship-carrying railway-car, the herein-described construction of cradle-like superstructure formed of U-shaped sections, lined with U-shaped hydrostatic cushions, and hinged together by transverse hinges at the base, so as to permit of vertical flexibility of the cradle, substantially as specified.

3. In a ship-carrying railway-car consisting of a cradle-like superstructure formed of U-shaped sections hinged together, the combination, with the platform B of each section, of the lateral upright members C C, adjustable in the transverse direction thereon, and of hydrostatic tubular cushions attached to the platform and resting against the upright members without being attached thereto, substantially as and for the purpose specified.

4. In a ship-carrying railway-car, consisting of a cradle-like superstructure formed of U-shaped sections hinged together, the combination, with the platform B of each section, of the lateral upright members C C, adjustable in the transverse direction thereon, one of said members being hinged so as to swing downward and outward to admit of the ship floating over it into or out of position, and of hydrostatic tubular cushions attached to the platform and resting against the upright members without being attached thereto, substantially as and for the purpose specified.

5. A ship-carrying railway-car constructed of U-shaped sections lined with hydrostatic tubular cushions and hinged together, as described, and supported on sets of compound

bogies, each set composed of a bogie proper
swiveling on a center pin and of any num-
ber of trucks, on which the superstructure
rests through the medium of rollers to per-
mit lateral guidance of said trucks by the
rails independently of the car, substantially
as specified.

The foregoing specification of my improve-
ments in cars for the conveyance of ships on

ship-railways signed by me this 22d day of 10
October, 1889.

WILLIAM SMITH.

Witnesses:

JOHN MUNRO ROGER,

ALFRED CRAWFORD,

*Both of No. 181 Union Street, Aberdeen, North
Britain, Law Clerks.*