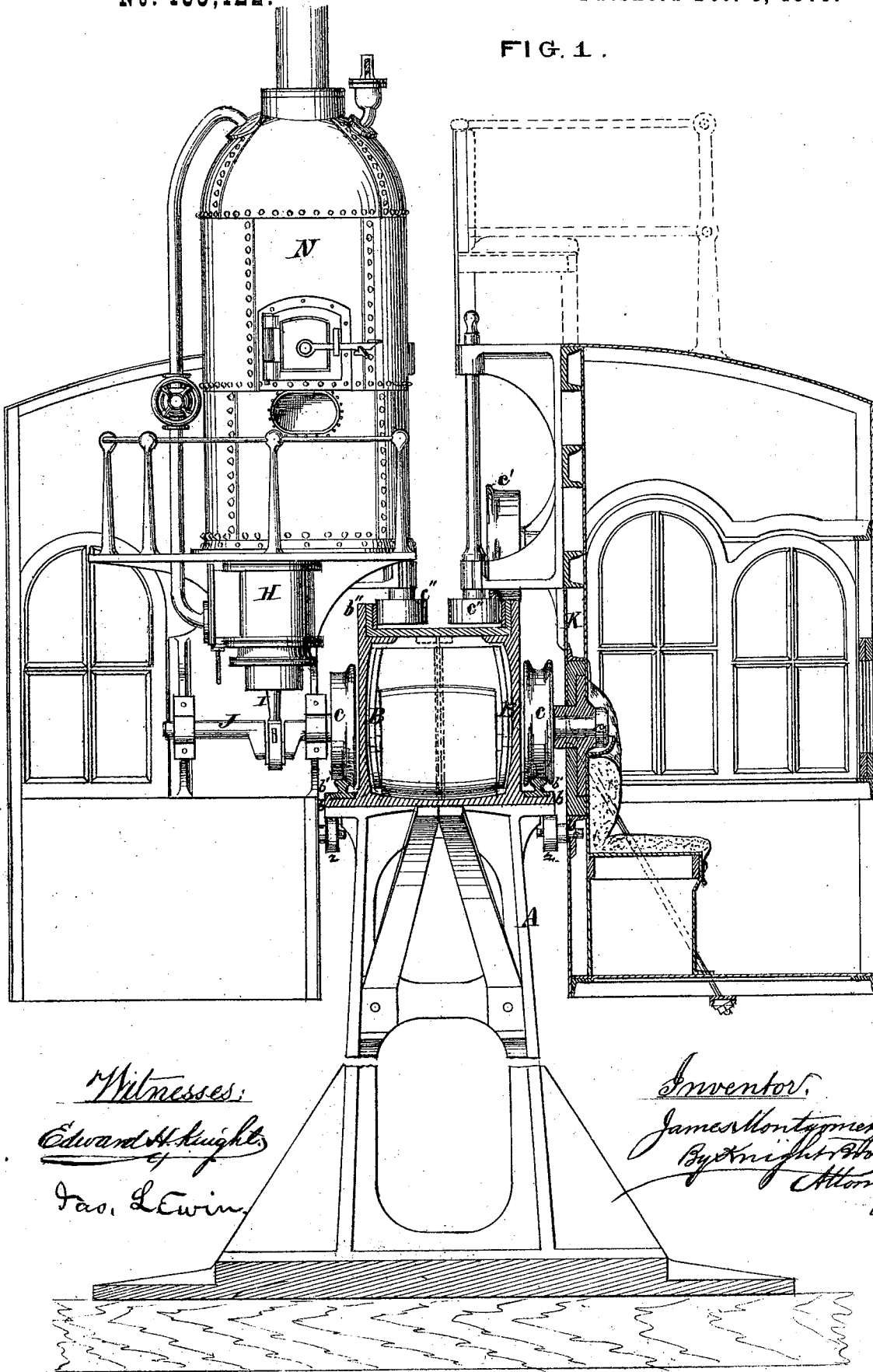


J. MONTGOMERY.
ELEVATED RAILWAY.

No. 185,122.

Patented Dec. 5, 1876.

FIG. 1.



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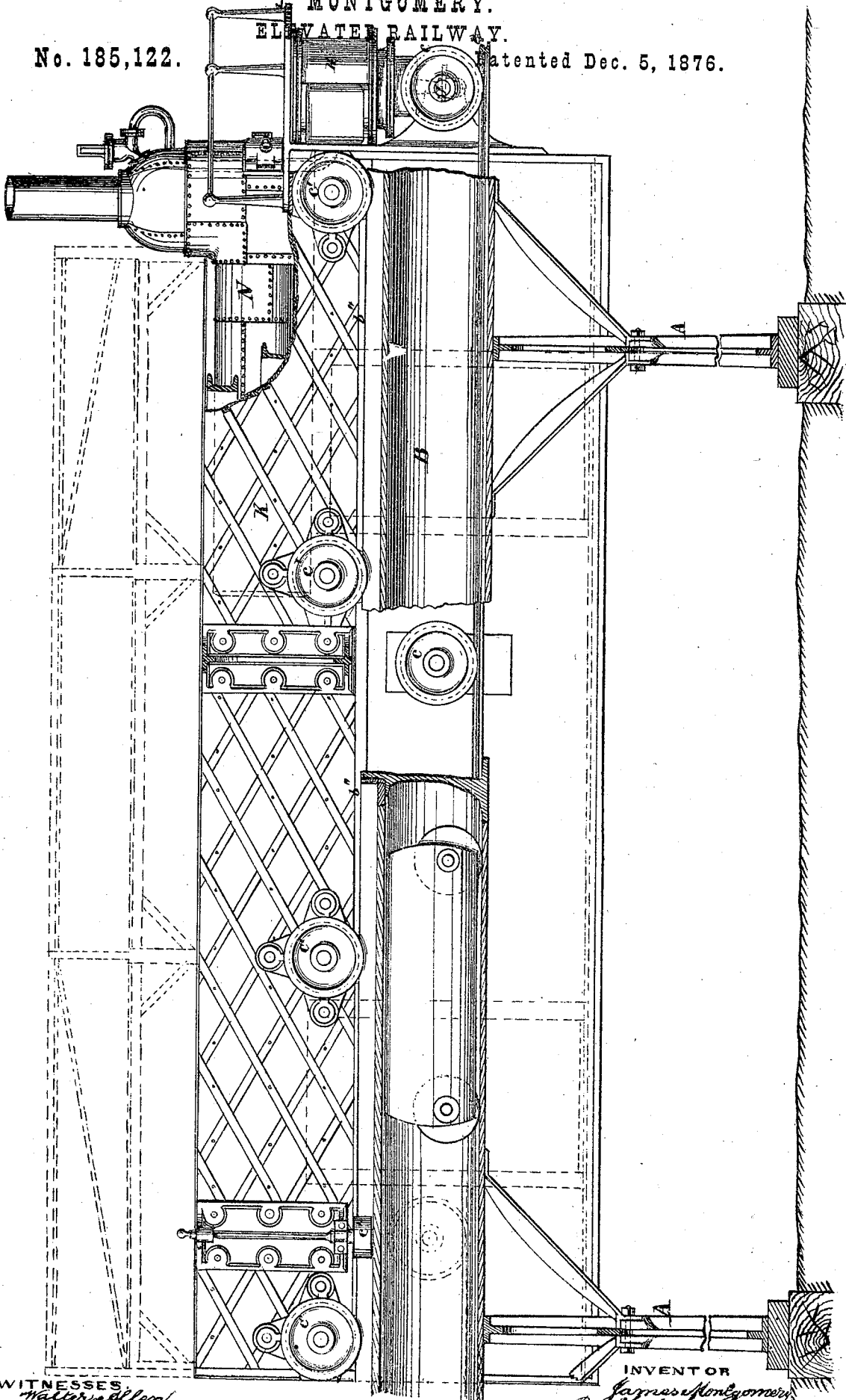


FIG. 2.

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UNITED STATES PATENT OFFICE.

JAMES MONTGOMERY, OF LIVINGSTON, NEW YORK.

IMPROVEMENT IN ELEVATED RAILWAYS.

Specification forming part of Letters Patent No. 185,122, dated December 5, 1876; application filed May 25, 1870.

To all whom it may concern:

Be it known that I, JAMES MONTGOMERY, of Livingston, in the county of Columbia and State of New York, have invented Improvements in Elevated Railways and Carriages therefor, of which the following is a specification:

My improvement consists, first, in a girder for elevated railways constructed with vertical and horizontal projecting flanges to adapt it to support a car projecting laterally on one side only of the said girder, so that by a duplication of parts a single girder may be made to support on its respective sides cars moving in opposite directions.

My improvement consists, secondly, in a combination of rails and wheels, the former being above and on the side of the girder, and the latter consisting of wheels with horizontal axes to rest on the upper and lower rails, and of wheels having vertical axes to resist the lateral strain of the overhung car.

My invention consists, thirdly, in constructing an elevated-railway girder hollow, so that it may serve as a pneumatic tube.

The carriage is made relatively long and narrow, so as to decrease the leverage incident to its overhanging position.

The engine and boiler are so placed as to come as much as possible over the supporting-way. They are made compact, so as to occupy but little width, the longitudinal room being abundant, while in other directions space cannot be readily spared.

Figure 1 is a transverse sectional view through the girder, and showing the end elevation of one carriage and a transverse section of the other. Fig. 2 is a partial side elevation, and part longitudinal vertical section.

A represents the central supporting-column, the section cutting transversely through the longitudinal girder and the foot-flange of one of the supports. The column A has a form to obtain the lightness consistent with the required strength. The height will vary with the position and purpose. In cities the height would be sufficient to enable the ordinary traffic to pass beneath it at the crossings. In country districts so great a height in some cases might not be necessary. In some cases

the supports may be of timber treated to protect it against decay or fire.

The girder B is made hollow, constituting, in fact, a long tube, the interior of which is hollow, as shown in cross-section, and may be of such form as to render it available as a tube for pneumatic transport. Upon the sides of the girder B are projecting flanges *b b*, which support the rails *b' b'*, on which traverse the principal wheels *c c* of the car. On the upper part of the girder are rising flanges *b'' b''*, which form rails on which traverse the upper supporting-wheels *c' c'* of the car. On the inside faces of the said flanges *b'' b''* traverse other car-wheels, *c'' c''*, which rotate in a horizontal plane, and act as stays to bear the lateral drag of the car due to its overhanging character, the center of gravity being outside of the line of support upon the rails *b' b'*.

One of the wheels *c* is driven directly by the engine, the wheels *c'* and *c''* being merely supporting and traversing wheels, not directly driven by the motor.

The permanent way is so contrived, and the carriages are so constructed and hung, that the former answers for two tracks to be traversed by carriages going in opposite directions. This subserves a number of purposes, especially saving of room in thoroughfares, and saving of cost of permanent way.

The girder B may be made of several sections bolted together. The sections may have a joint in a vertical or in a horizontal plane. The tubular interior may consist of one, two, or more chambers to afford opportunity for pneumatic dispatch in two different directions simultaneously. The divisional piece is shown in dotted lines in Fig. 1.

The feet of the timber posts in the ground may be embedded in a mass of concrete, which will harden and form a base to prevent lateral swaying.

The tubular girder may be used as a water-main for town, or a gas-main for towns, or for sewerage or drainage purposes for high levels.

The girder-tubes may be wrought or cast. In either case the structure possesses the important qualification of combined strength

and lightness in the greatest possible degree the material admits of, in addition to its adaptation to furnish, by its interior, additional means of transit.

The supporting-posts or trestle-work may be wrought-iron tubes, the ends having iron blocks cast thereon.

The tube itself may have sliding couplings at the joints to allow for expansion and contraction from change of temperature.

Wheels *z z*, Fig. 1, are attached to the carriage, and run beneath the lateral rails, so as to prevent the rising of the car, and its consequent running from the track.

Fig. 2 is a side view of a portion of the permanent way, and one of the cars in position.

It will be seen that the girder B is supported by diagonal braces from the pillar A. The three sets of wheels are seen in side elevation. To the axle of one of the principal wheels *c* the pitman of the engine H is connected. The upper wheels *c'* are shown running upon the top flanges *b''* of the girder, and the horizontally-rotating wheel *c''* running against the side of the said flange.

The carriage is driven by a steam-engine. The weight of the engine and boiler is disposed as nearly as possible over the wheels *c*. The kind I prefer to use is one of my own invention.

The said engine is the subject-matter of United States Patent No. 108,718, issued to me October 25, 1870, and need not be particularly described in this place.

The pitman is connected at its upper end to the piston-head, and at its lower end to the crank-axle of the wheel. The boiler is of the vertical form, and has the usual accessories.

The car is preferably of steel, for purposes of strength and lightness. There is a pecu-

liar necessity for lightness in this connection. The permanent way may be lighter if the rolling-stock be all of steel. The rolling-stock itself being much lighter without deterioration of strength the proportion of the dead-weight to the freight-carrying capacity is much less. The amount of power required to move it is lessened, which is of especial importance in this case where the motor is required to occupy but small space, and that, perhaps, in a somewhat unusual position.

In Fig. 1 I have shown the boiler and engine at one end of the carriages.

I claim—

1. A girder, B, for elevated railways, constructed with vertical and horizontal projecting flanges to adapt it to support a car projecting laterally on one side only of the said girder, so that by a duplication of parts a single girder may be made to support on its respective sides cars moving in opposite directions, substantially as described.

2. The described combination of rails and wheels, the former being above and on the side of the girder, and the latter consisting of wheels with horizontal axes to rest on the upper and lower rails, and of wheels having vertical axes to resist the lateral strain of the over-hung car, as and for the purpose described.

3. A continuous tube or hollow girder in an elevated railway possessing the two functions of a road-bed or support for independent lines for transit in opposite directions, and also as a tube for pneumatic transport, as described.

JAMES MONTGOMERY.

Witnesses:

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