

(No Model.)

2 Sheets—Sheet 1.

G. C. KUHLMAN.
CONSTRUCTION OF RAILWAY CARS.

No. 546,592.

Patented Sept. 17, 1895.

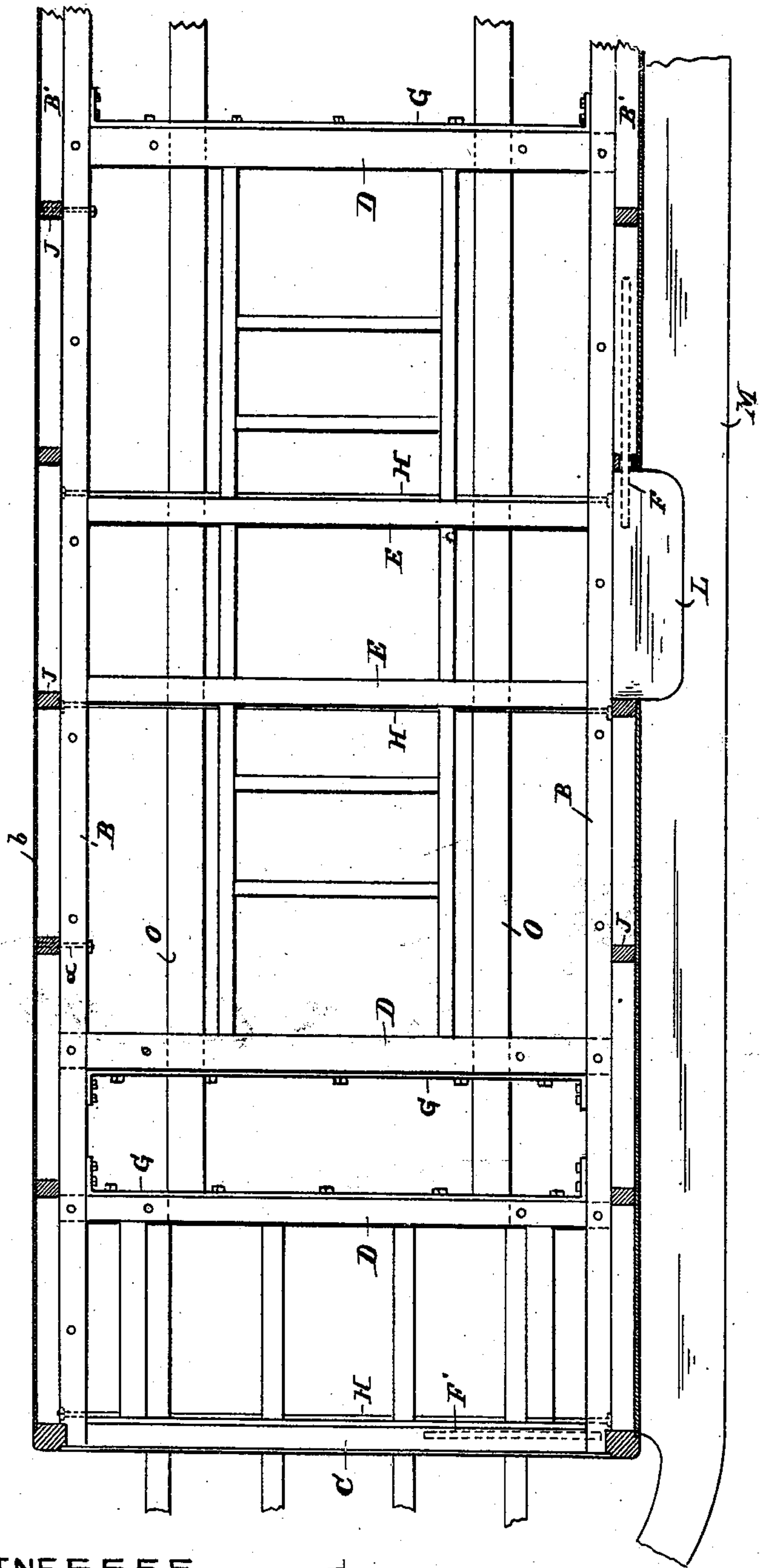


FIG. 1

WITNESSES

J. Mengling
R. F. Laganke.

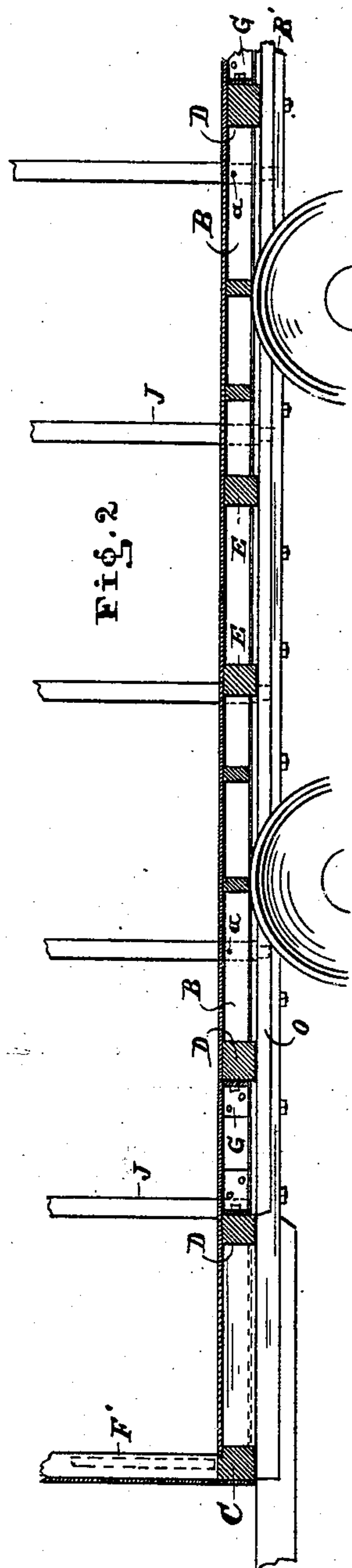


FIG. 2

INVENTOR

G. C. Kuhlman
BY *B. F. Eibler* Attorney

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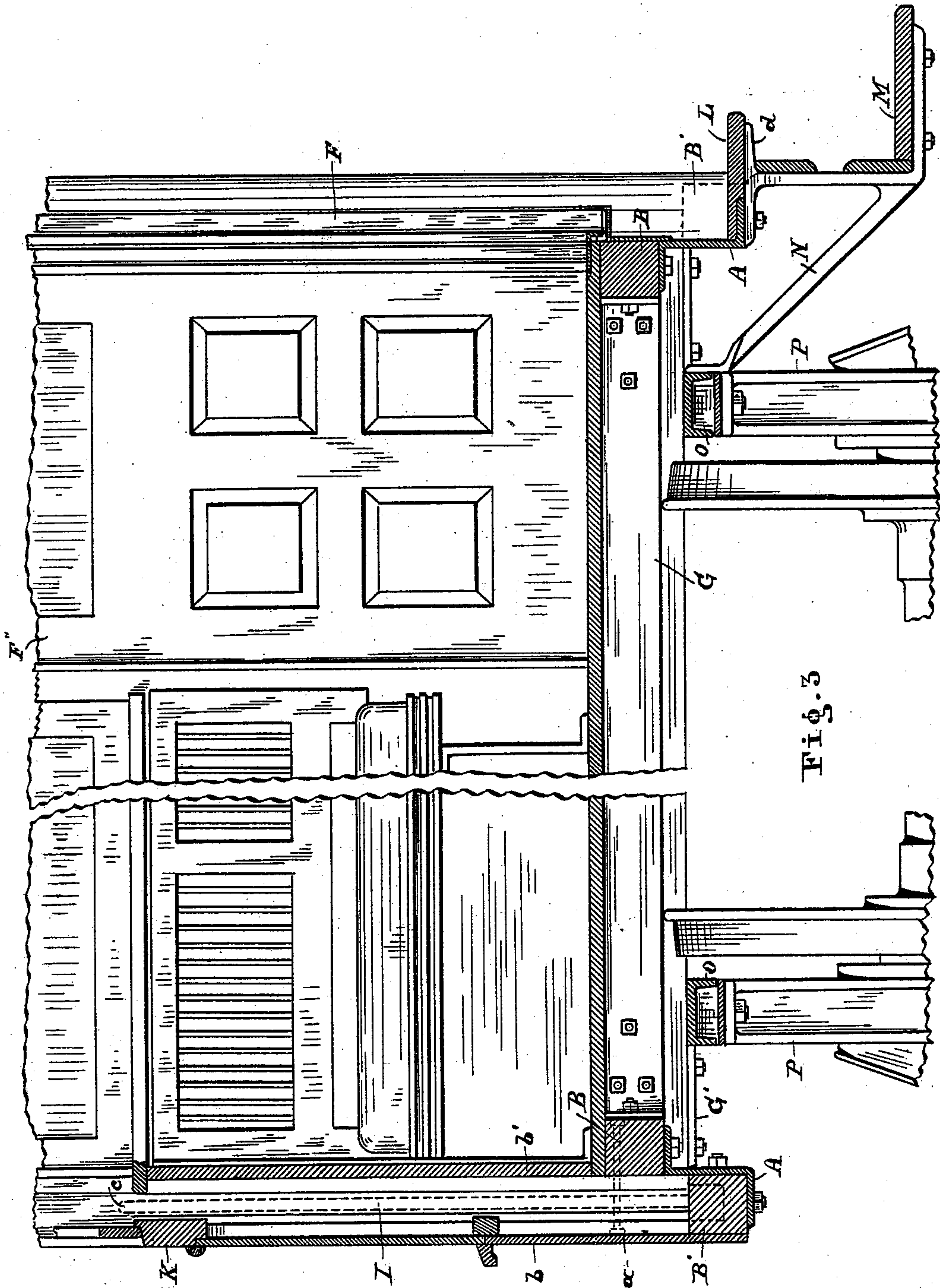


Fig. 3

WITNESSES

J. Zuengling.
R. F. Lagan Re.

INVENTOR

G. C. Kuhlman
BY *B. F. Eibler* *attorney.*

UNITED STATES PATENT OFFICE.

GUSTAVE C. KUHLMAN, OF CLEVELAND, OHIO.

CONSTRUCTION OF RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 546,592, dated September 17, 1895.

Application filed January 5, 1895. Serial No. 533,921. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVE C. KUHLMAN, a citizen of the United States, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented an Improved Frame Construction for Railway-Cars; and I do hereby declare that the following is a full, true, and exact description thereof.

My invention relates to improvements in railway-cars, particularly street motor-cars, and the objects of my improvement are, first, to enhance the strength and durability of the frame part of said cars; second, to render convenient the application of large windows, and, third, to maintain the full width of the cars throughout the length of same.

That the invention may be fully understood and seen, reference will be had to the following specification and the accompanying drawings, in which—

Figure 1 represents a partial plan view of the skeleton frame of a car. Fig. 2 is a vertical sectional view of the same, and Fig. 3 represents a partial cross-sectional view of the same.

Like letters of reference denote like parts in the drawings and specification.

For illustration, the improvements above referred to are shown in connection with what is technically known as a "side-aisle car," as it is in this style of cars where such improvements are most essential.

Strength and durability of and for the skeleton frame of the car I attain by the application of angular truss-plates A A in connection with the floor side sills B B. Said plates are adapted to carry auxiliary sills B' outside and below said floor-sills. (See Fig. 3.) The floor-sills are framed in the usual manner with the end sills C, the intermediate floor-timbers D D and the center timbers E E. (See Fig. 1.)

The side door is indicated as at F. An end door is placed at F', and F'' indicates the door at the opposite end. (See Fig. 3.) Reinforcing-plates G G and G' G' are provided for the intermediate timbers D D, and the sills B B and transverse rods H establish a secure connection of the end sills and center timbers with said side sills B B.

The distance between the levels of the floor-sills and that of the auxiliary sills may vary,

according to the height of said sills and the depth of the angular plates.

In or upon the sills B' are secured or placed the posts J J, while the outer side of the floor-sills affords additional opportunity for bracing said posts.

Connection of the post and floor-sills may be had by means of a bolt a, screw, or equivalent means. (See Figs. 2 and 3.) Longitudinal as well as lateral strains are thus met by an abundantly strong structure of the posts J, in connection with the auxiliary sills B' and the floor-sills B.

In extending the posts below the floor-sills additional advantages are attained—namely, that of providing for room for the windows I and sliding door F.

In cars of the class as mentioned it is customary to apply large windows, and such windows can be lowered in the above-named instance to the full extent of the passage or clearance formed by the posts, sills B', and the sidings b b' of the car. The objectionable feature, as is experienced in single-sill cars, of having a large portion of the window-sash protruding above the window-casing is thereby avoided. Cars of the side-aisle style are in use the year around, and during the summer months the windows almost constantly remain lowered. It is thus desirable that the entire window-openings are cleared upon lowering the windows to admit of an abundant circulation of air.

The dotted lines I in Fig. 3 indicate the window in its lowered position and resting upon the auxiliary sill. The upper part or rail c of the window-sash is then about or nearly in line with the window-sill K. The height of said sill in relation to the floor-line is limited for various reasons. The entire height of the car, convenience, and appearance thereof would not admit of increasing the height of the window-sill sufficiently to dispose of large windows in the manner as shown, if such windows could not descend below the floor-sills. By or with the improvements, as above stated, clearance or room for any size windows can be established to suit the conditions of and with the window-sill.

The auxiliary sills may be more or less in thickness, since said sills are supported by means of the metallic angular plates, and, fur-

thermore, the plate itself can have the angular flanges more or less apart to provide for the necessary room for particular sizes of windows. Arranged in connection with said plates are truss-rods and braces to increase the stability of the car-frame, said braces (being of the common type) are not shown in the drawings.

The presence of means for securing the posts for the side sliding door below the floor-sills admits of placing and sliding said door within the real or actual car-partition, as seen in Figs. 1 and 3. No space of the interior of the car is thus taken up by said door and the necessary interior inclosure thereof.

The auxiliary sills terminate in and with the door-posts, which admits of placing the step L adjacent the floor sill or plate thereof, rendered more convenient is thereby the ascension from the running foot-board M unto said step L. (See Fig. 3.)

Braces of the construction, as shown at N, are provided for support of the step L and the running foot-board. Preferably said braces are secured to the channel-iron O and the angular plate in the manner as shown in Fig. 3, the branch *d* being omitted for braces outside the reach of the steps.

The fact of providing room for the door and the step without curtailing the interior or the necessity of increasing the exterior width of the car is another of the characteristic features of my invention, for such advantages could not be attained without the application of the above-described angular plate or bar A and the supplementary sill or sills B'.

The channel iron or irons above cited extend beneath the car-frame, as shown in Fig. 1, and serve as an efficient means for attachment of the pedestals P for the car-axle boxes. (See Fig. 3.) The above-described construction of car-frames is especially useful in cars of the side-aisle style, for with such cars, if constructed in the ordinary manner, it has been the experience that the car-frame is weakest at the side-aisle side, owing to the fact that said side cannot be braced as efficiently as the opposite thereof, where the abutting seat-frames serve as means to increase the stability of the car-frame. Furthermore, it is the side-aisle side which is taxed more severely, for it is a frequent occurrence that passengers are crowding and seeking

equilibrium and support in the aisle as well as upon the exterior running foot-board. By providing support for the posts substantially in the manner as shown the necessary stability is attained for said aisle side, even if subjected to the most severe trials.

From the foregoing it can readily be seen that some of the advantages above cited can be attained in any style of cars if constructed substantially in the manner as shown.

Angular bars and auxiliary sills arranged below the actual floor-sills admit of the application and displacement of large or high windows and such windows are an essential feature in cars of modern style or construction.

As seen in the drawings, Fig. 3, ready access is had to bolts or screws which are employed for fastening of the posts and sills, thus a ready adjustment thereof can be had or made at any time, which in turn greatly enhances the durability of said car-frame or cars proper.

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

1. In cars, the two side sills, one arranged below the other, combined with angle plates for securing the sills together, substantially as shown.

2. In cars, the two side sills, one arranged below the other, combined with the side posts, which have their lower ends to rest upon the lower sills and which are bolted directly to the outer sides of the upper sills, substantially as described.

3. In cars, the floor sills B, the auxiliary sills B', placed below the floor sills, and the sidings *b b'*, of the cars secured to the two sills, combined with the windows and doors which close into the spaces between the sidings but outside of the flooring of the car, substantially as set forth.

4. In a car, the upper sills, extending the full length of the car, the lower sill formed in two parts, and the sliding door, moving about on a level with the floor of the car, combined with steps placed between the inner ends of the lower sills, and below the door, substantially as specified.

In testimony whereof I hereto set my hand and seal in presence of two witnesses.

GUSTAVE C. KUILMAN. [L. S.]

Witnesses:

B. F. EIBLER,
F. H. MITCHEL.