

No. 754,610.

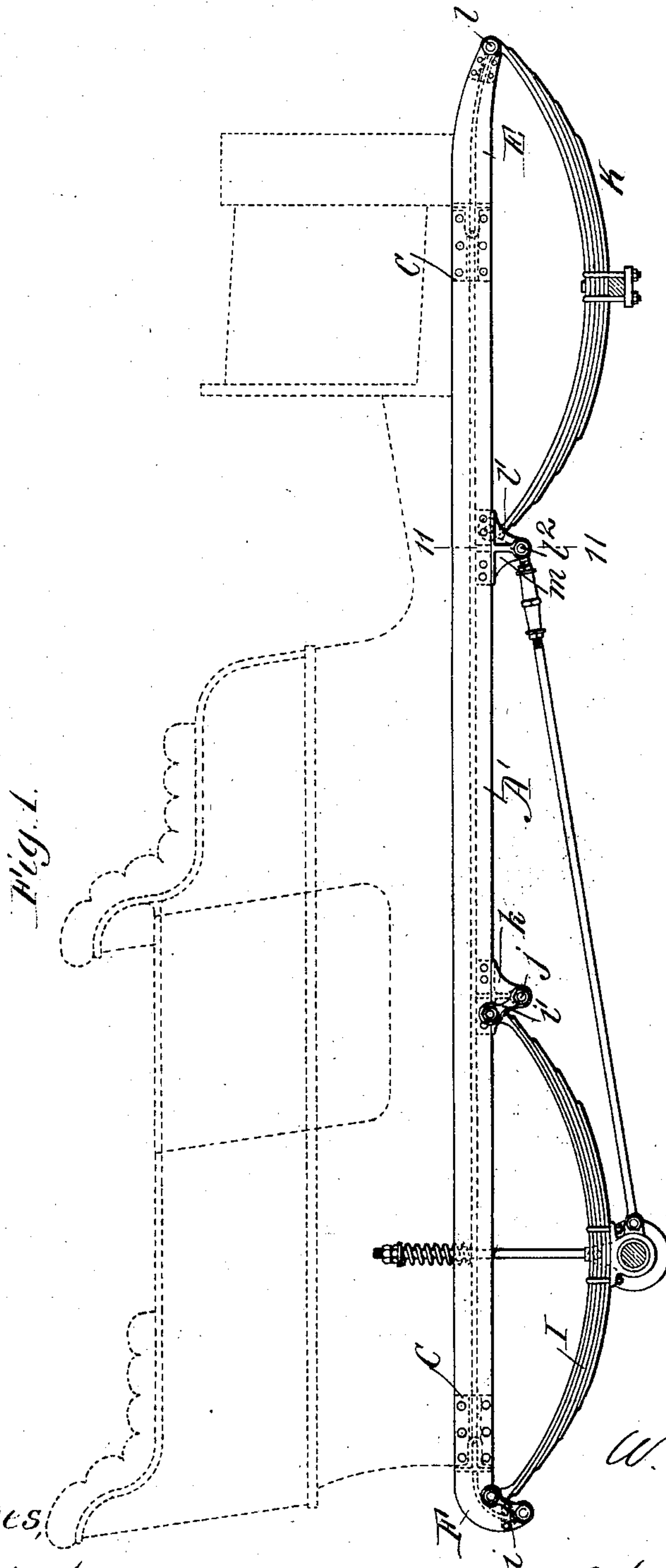
PATENTED MAR. 15, 1904.

W. F. RICHARDS.
VEHICLE FRAME AND SPRING CONSTRUCTION.

APPLICATION FILED NOV. 25, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses,

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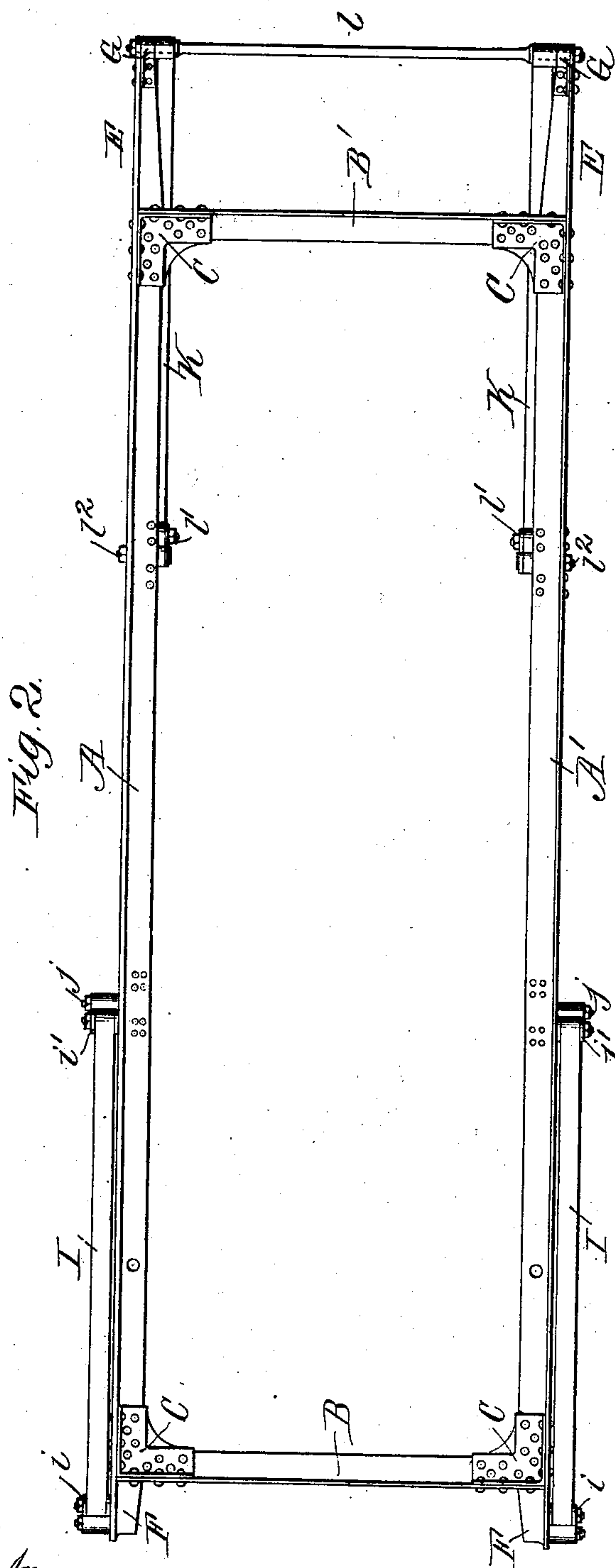
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3 SHEETS—SHEET 2.



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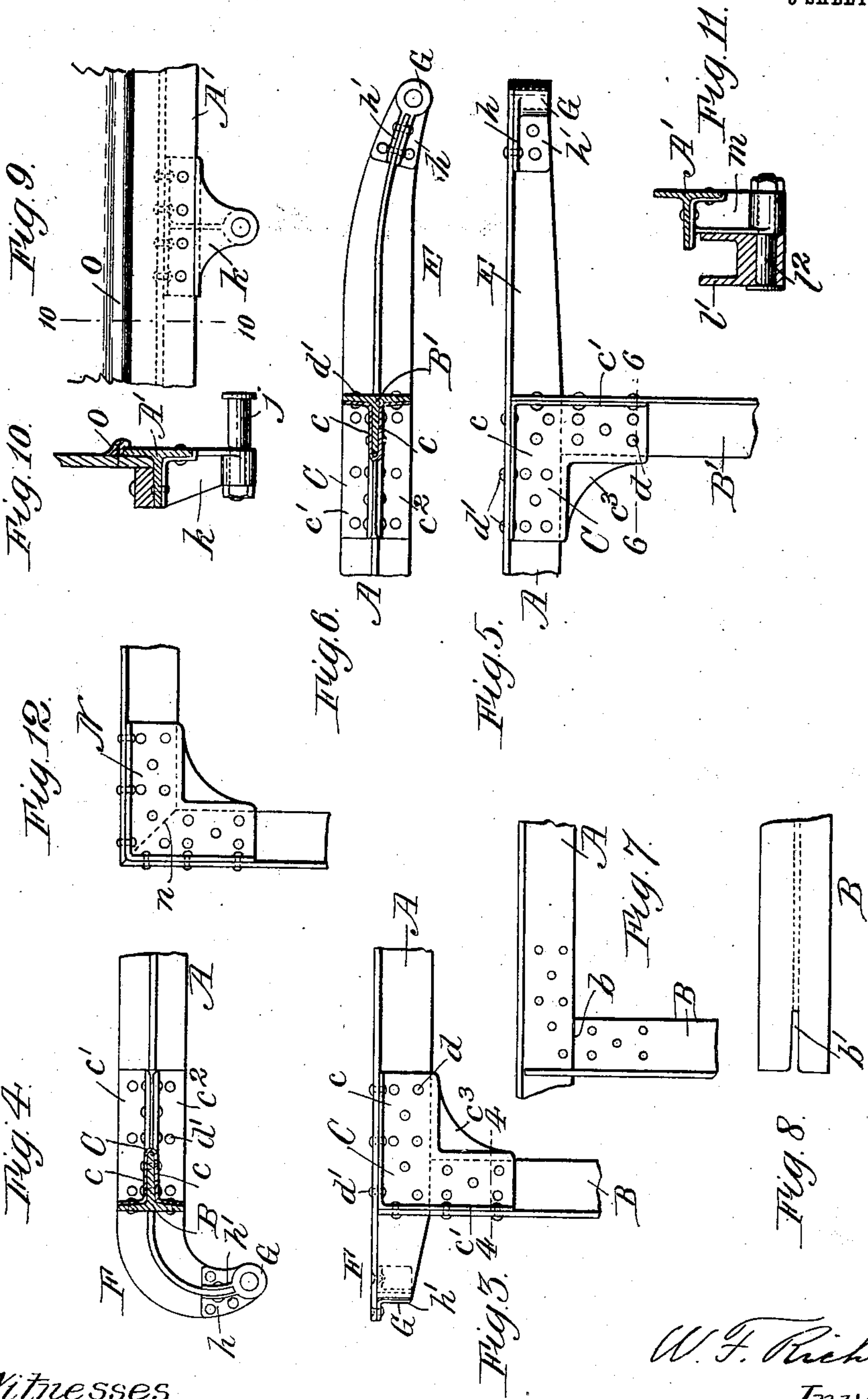
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3 SHEETS—SHEET 3.



Witnesses,
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UNITED STATES PATENT OFFICE.

WILLARD F. RICHARDS, OF BUFFALO, NEW YORK.

VEHICLE FRAME AND SPRING CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 754,610, dated March 15, 1904.

Application filed November 25, 1903. Serial No. 182,655. (No model.)

To all whom it may concern:

Be it known that I, WILLARD F. RICHARDS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Vehicle Frame and Spring Constructions, of which the following is a specification.

This invention relates to vehicle-frames, and more particularly to metallic supporting or body frames for automobiles. Metallic frames of various construction have been employed in the building of vehicles of this class; but great difficulty has been experienced in constructing a desirable light frame of neat appearance which has the necessary rigidity and strength, especially at the corners of the frame.

One object of the present invention is to provide a metallic supporting or body frame for vehicles which is light and of attractive appearance and has great stiffness and strength, especially in a vertical direction at the corners of the frame—that is, at the junctures of the longitudinal and transverse frame-bars.

Another object of the invention is to so construct the frame that the projecting arms or horns at the front and rear ends of the frame for the connection of the body-springs are formed by internal continuations of the side frame-bars.

Another object is to make the metallic frame of such form that it incloses and embraces the lower portion of the wooden body, thereby preventing the body sides from tearing or breaking away from the wooden floor-sills under lateral strain and pressure and permitting the use of light floor-sills.

A further object of the invention is the provision of means to absorb or cushion the rebound of the vehicle-body in use to prevent breaking the body-springs.

In the accompanying drawings, consisting of three sheets, Figure 1 is a side elevation of a metallic vehicle-frame embodying the invention, showing the vehicle-axles in section and showing the vehicle-body by dotted lines in position on the frame. Fig. 2 is a plan view of the metallic frame. Fig. 3 is a fragmentary plan view, on an enlarged scale, showing

the corner construction at the rear end of the frame. Fig. 4 is a sectional elevation in line 4 4, Fig. 3. Fig. 5 is a fragmentary plan view, on an enlarged scale, showing the corner construction at the front end of the frame. Fig. 6 is a sectional elevation in line 6 6, Fig. 5. Fig. 7 is a fragmentary plan view, on an enlarged scale, showing one of the corner-joints of the frame-bars before the corner-piece is secured thereto. Fig. 8 is an elevation of one end of one of the transverse frame-bars. Fig. 9 is a fragmentary side elevation, on an enlarged scale, showing the manner of mounting the body in the metallic frame and also showing one of the hanger-brackets for the rear springs. Fig. 10 is a transverse section in line 10 10, Fig. 9. Fig. 11 is a transverse section, on an enlarged scale, in line 11 11, Fig. 1, showing one of the hanger-brackets. Fig. 12 is a fragmentary plan view, on an enlarged scale, showing a corner construction of a modified form.

Like letters of reference refer to like parts in the several figures.

The horizontal metallic vehicle-frame comprises opposite parallel longitudinal or side frame-bars A A' and parallel transverse or end frame-bars B B', which extend between and are connected at their ends to the side frame-bars. Each of the metallic frame-bars preferably consists of a single ordinary commercial-rolled T shape arranged with the two head-flanges in a vertical plane and the leg-flange extending inwardly from the central portion of the head. The several frame-bars are arranged in the same horizontal plane, and the end portions of the leg-flanges of the transverse bars are sheared off, as shown at *b* in Fig. 7, and the ends of the vertical head flanges or portion of the transverse bars are slotted at *b'*, Fig. 8, in the plane of their leg-flanges. The horizontal leg-flanges of the longitudinal bars extend into the slots *b'* in the ends of the transverse bars and abut against the ends of the leg-flanges of the transverse bars. The horizontal leg-flanges of all of the bars occupy the same horizontal plane. The longitudinal and transverse bars are securely connected at the corners of the frame by malleable-iron corner pieces or castings C, Figs. 100

2 to 6. Each of the corner-pieces is of L or angle shape and comprises two parallel separated webs or plates c , which are jointed at their inner edges and are provided at their outer edges, respectively, with upwardly and downwardly projecting vertical marginal or L-shaped flanges c' c'' , which bear against the inner faces of the upper and lower head-flanges of both the side and transverse frame-bars.

Each corner-piece is also preferably provided with a web or brace portion c^3 , which connects the inner edges of its two legs. The two webs of the corner-piece straddle and embrace the horizontal leg-flanges of the side and transverse bars, as shown in Figs. 4 and 6. The web-plates of the corner-piece are drawn tightly against the horizontal leg-flanges of the frame-bars to securely grip and hold the latter by rivets d , after which the upper and lower vertical flanges of the corner-piece are connected to the upper and lower vertical flanges of the frame-bars by rivets d' . The corner fastening or connection just described is extremely stiff, strong, and rigid. The horizontal flanges of both the side and transverse bars are practically made continuous and reinforced by the web-plates of the corner-piece. The vertical flanges of the bars also meet and are connected and reinforced by the vertical flanges of the corner-piece.

This manner of connecting the side and transverse frame-bars enables the several flanges of the side frame-bars to extend continuously or unbroken beyond the corners of the frame or their points of connection with the transverse frame-bars to provide the projecting front and rear arms or horns E and F for the front and rear body-springs. The spring-arms thus have great vertical as well as lateral stiffness and can withstand the severe torsional strains to which they are subjected in the use of the vehicle. Each spring-arm is provided at its end with a malleable-iron eyepiece G for the spring-bolt. The eyepiece preferably has vertical flanges h , which bear against and are riveted to the vertical flanges of the spring-arm, and horizontal separated webs or plates h' , which embrace and are riveted to the end portion of the leg-flange of the spring-arm.

The leg-flange of the arm is sheared off to terminate at the inner side of the eye, as shown in Figs. 4 and 6.

It is usually desirable in vehicles of this character to arrange the rear body-springs outside of the body-frame to obtain as wide a spring-base as possible to steady the body and prevent it from canting and to arrange the front springs inside of the vertical planes of the sides of the body to give the necessary clearance for the front steering-wheels and to give more flexibility to the front portion of the vehicle. In the construction shown in the drawings the swinging links i for the rear ends of the rear springs I are pivoted on stationary bolts or pins, which are secured in

and project from the eyes of the rear spring-arms, and the swinging links i' for the front end of the rear springs are pivoted at their lower ends on bolts or pins j , which are secured in and project outwardly from hanger-brackets k , which are constructed as shown in Figs. 9 and 10, and are securely riveted to the horizontal and lower vertical flanges of the side frame-bars with their outer vertical faces flush with the outer faces of the vertical flanges of the side bars. This arrangement locates the swinging links for both ends of the rear springs beside the outer face of the side frame-bars, which thus prevent any lateral movement or deflection of the springs.

The front ends of the front springs K are preferably connected directly to the ends of the front spring-arms by a transverse rod l passing through the eyes of the arms, while their rear ends are pivoted to the free ends of the swinging links l' , which are pivoted on bolts or pins l'' , secured in and projecting inwardly from the lower ends of the hanger-brackets m , which are securely riveted to the horizontal and lower vertical flanges of the side frame-bars.

These hanger-brackets for the front springs have broad vertical inner faces against which the links for the front springs are adapted to bear to prevent any lateral movement or deflection of the front springs.

In case it is desired to terminate the side frame-bars at the end transverse bars and employ separate spring-arms of other construction the side and end frame-bars are preferably joined, as shown in Fig. 12. A corner-piece N of the form described is employed to connect the ends of the transverse and side bars; but the horizontal leg-flanges of the bars are preferably sheared off at an angle of forty-five degrees to produce a miter-joint, as shown at n in said figure; otherwise the manner of connecting the bars is the same as previously described.

The body of the vehicle is supported on horizontal leg-flanges of the metallic frame-bars, being thereby located within and surrounded by the vertical upwardly-projecting flanges of the frame. These flanges of the frame extend above the wooden side or floor sills of the body and prevent the sides of the body from being forced outwardly from the sills and enables the employment of much lighter wooden sills. In order to give an attractive appearance to the vehicle and also to make the joint between the metallic frame and vehicle-body weather-tight, a molding O of any desired form is secured to the lower portion of the body and overhangs the vertical flanges of the metallic frame. This molding adds greatly to the appearance of the vehicle, the metallic frame topped by the molding giving the appearance of base boards or panels.

I claim as my invention—

1. A metallic vehicle-frame comprising longitudinal and transverse bars each having a

vertical portion and a horizontal flange extending inwardly from said vertical portion, the horizontal flanges of the several bars being located in the same horizontal plane, and
 5 corner - pieces embracing said horizontal flanges and secured to said vertical flanges, substantially as set forth.

2. A metallic vehicle-frame comprising longitudinal and transverse bars each having a
 10 vertical flange and a horizontal flange extending inwardly from said vertical flange, and corner connecting-pieces having separated horizontal portions embracing and riveted to said horizontal flanges of the frame-bars, and vertical
 15 flanges located beside and riveted to said vertical flanges of the frame-bars, substantially as set forth.

3. A metallic vehicle-frame comprising longitudinal and transverse **T**-bars each arranged
 20 with the head-flanges vertical and leg-flange extending inwardly, and corner connecting-pieces having separated portions embracing and riveted to said inwardly-extending flanges of the frame-bars and vertical flanges located
 25 beside and riveted to said vertical flanges of the frame-bars, substantially as set forth.

4. A metallic vehicle-frame, comprising longitudinal and transverse **T**-bars each arranged
 30 with its head-flanges vertical and its leg-flange extending inwardly from the head-flanges, the leg-flange of one bar passing through a slot in the end of the bar at right angles thereto, and

corner-pieces connecting said longitudinal and transverse frame - bars, substantially as set forth.

5. A metallic vehicle-frame comprising longitudinal **T**-bars arranged with the leg-flanges projecting inwardly and transverse **T**-bars connecting said longitudinal bars between
 40 their ends and having slots through which the leg-flanges of the longitudinal bars pass, and corner-pieces connecting said longitudinal and transverse bars, substantially as set forth.

6. A metallic vehicle - frame comprising transverse **T**-bars arranged with their head-
 45 flanges vertical and their leg-flanges extending inwardly from the head-flanges and terminating short of said head-flanges, the ends of said head-flanges being slotted, and longitudinal **T**-bars arranged with their head-
 50 flanges vertical and their leg-flanges extending inwardly and entering said slots in the ends of said transverse bars, said longitudinal bars extending beyond said transverse bars
 55 and constituting attaching-arms for the vehicle-springs, and corner-pieces connecting said longitudinal and transverse frame-bars, substantially as set forth.

Witness my hand this 20th day of November, 1903.

WILLARD F. RICHARDS.

Witnesses:

JNO. J. BONNER,

C. M. BENTLEY.