No. 726,049. PATENTED APR. 21, 1903.

P. GRANT.

CONSTRUCTION OF UNDERFRAMES FOR RAILWAY WAGONS, &c.

APPLICATION FILED SEPT. 6, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

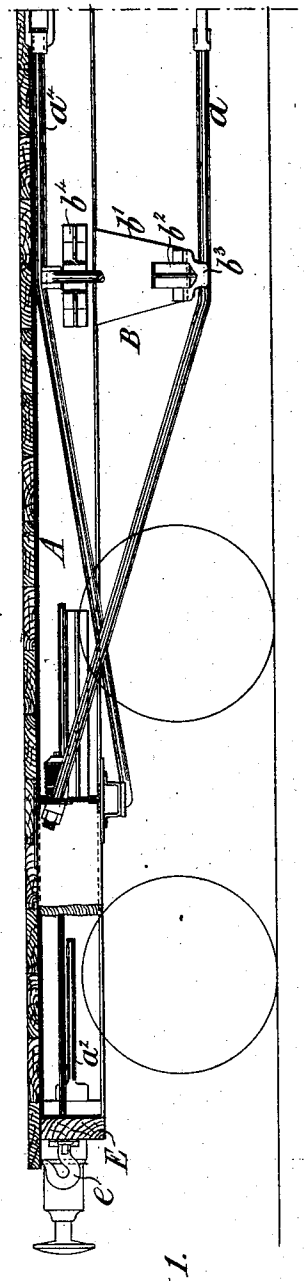


Fig. 1.

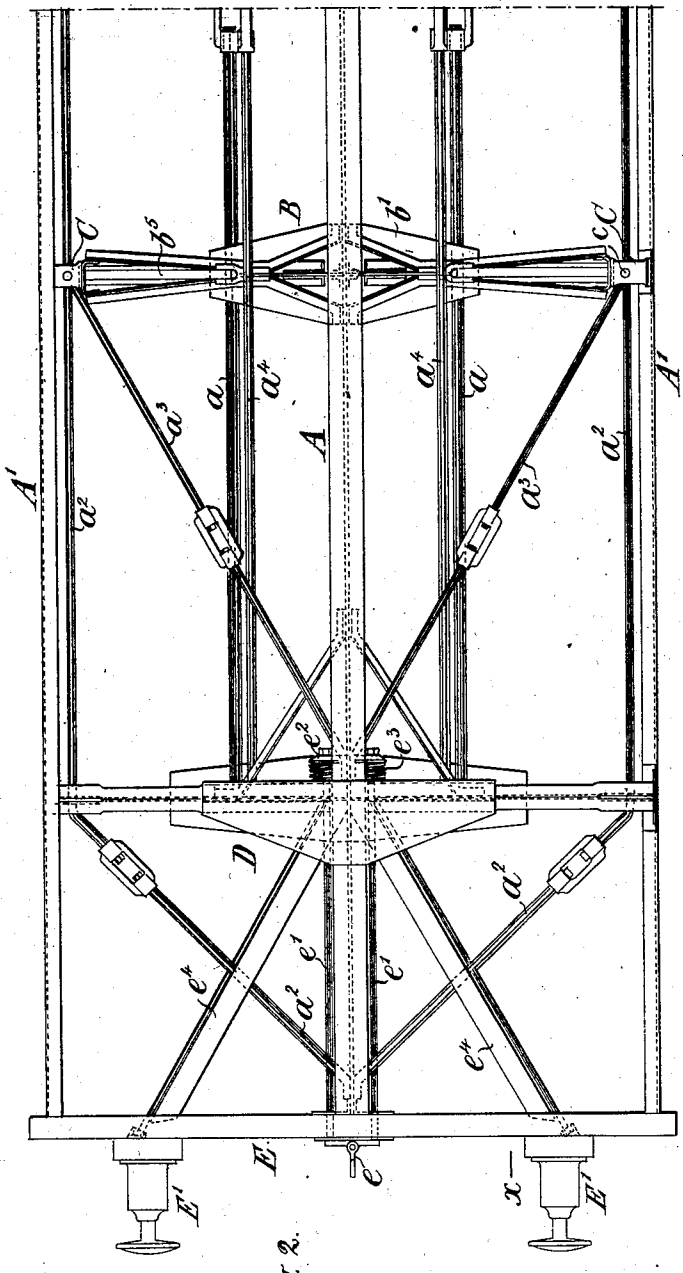


Fig. 2.

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NO MODEL. 3 SHEETS—SHEET 2.

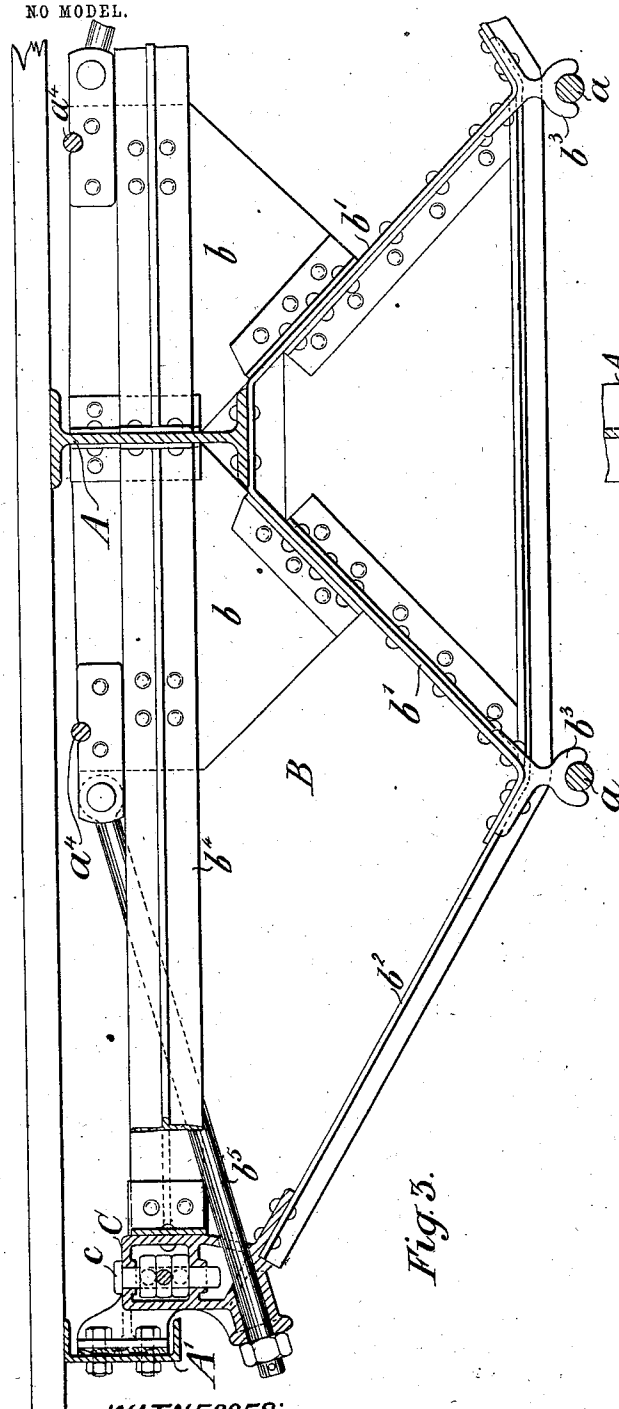


Fig. 5.

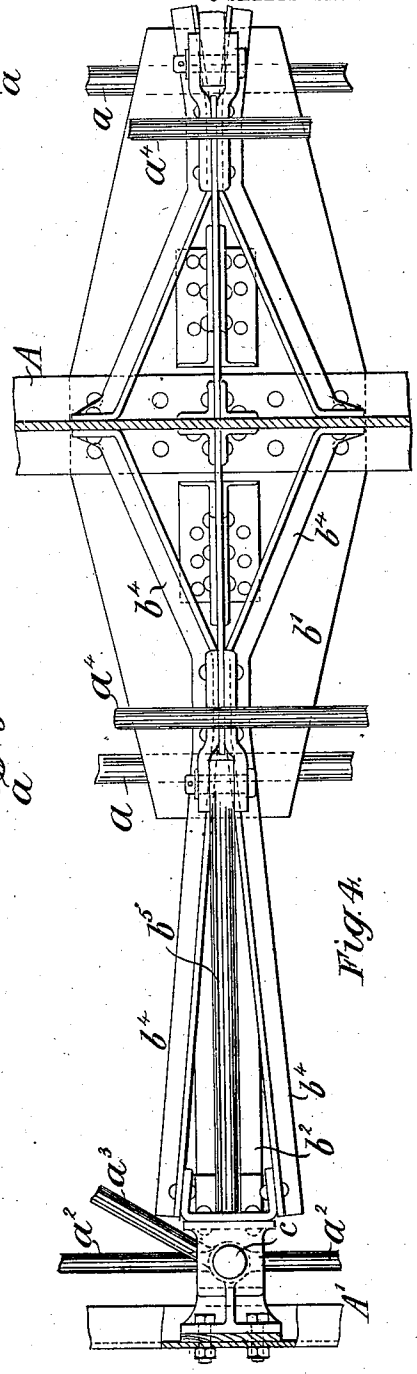


Fig 4.

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NO MODEL. 3 SHEETS—SHEET 3.

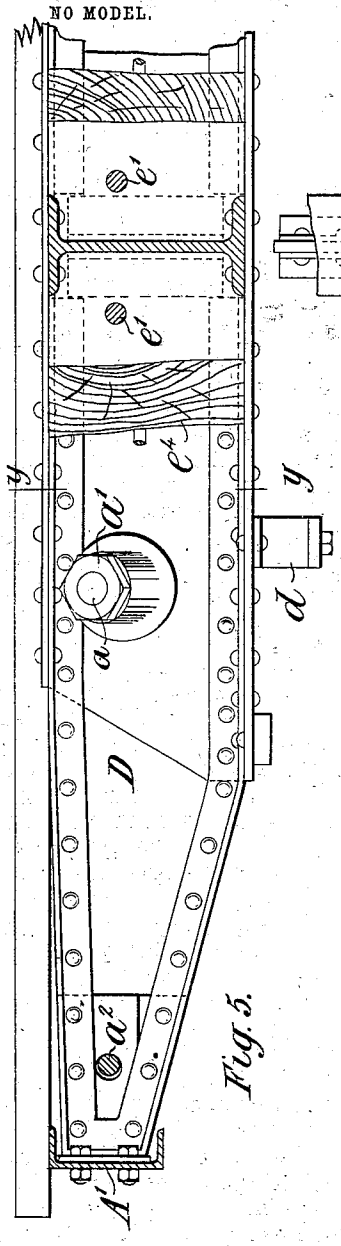


Fig. 5.

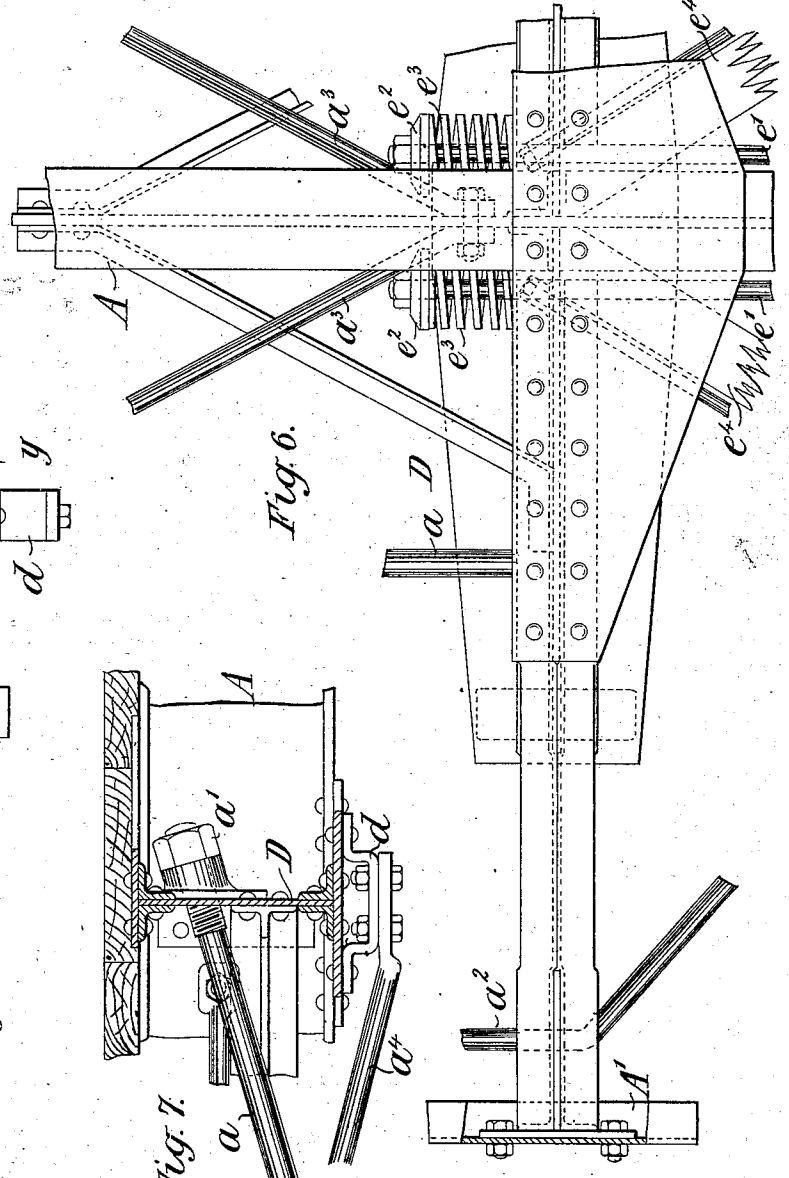


Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE.

PERCY GRANT, OF BANFIELD, BUENOS AIRES, ARGENTINA, ASSIGNOR TO WILLIAM JOHNSON, OF BUENOS AIRES, ARGENTINA.

CONSTRUCTION OF UNDERFRAMES FOR RAILWAY-WAGONS, &c.

SPECIFICATION forming part of Letters Patent No. 726,049, dated April 21, 1903.

Application filed September 6, 1902. Serial No. 122,326. (No model.)

To all whom it may concern:

Be it known that I, PERCY GRANT, a subject of the King of Great Britain and Ireland, residing at Banfield, Province of Buenos Aires, Argentina, have invented new and useful Improvements in the Construction of Underframes for Railway-Wagons and other Vehicles, of which the following is a specification.

This invention relates to an improved method of constructing the underframes of railway-wagons and other vehicles, whereby strength and simplicity are combined with a considerable reduction in the ratio of the tare to the maximum carrying load.

In the accompanying drawings, which illustrate an underframe for railway-wagons constructed according to the present invention, Figures 1 and 2 are views illustrating the general arrangement of the underframe, Fig. 1 being a longitudinal section taken on the line $x\,x$ in Fig. 2, which latter is a plan corresponding with Fig. 1, the flooring being removed to show more clearly the construction of the underframe. In these figures only one half of the framing has been shown, the other half being a counterpart thereof. Figs. 3 and 4 are respectively an elevation and a plan of the central cantalivers, Figs. 5 and 6 being views similar to Figs. 3 and 4 of the bogie center cantalivers. Fig. 7 is a transverse section taken on the line $y\,y$ in Fig. 5.

In applying the present invention, by way of example, to a bogie-wagon the underframe comprises a main girder A, arranged centrally along the length of the wagon and supported on the bogie center cantalivers. This girder may be of timber, or of iron or of steel of I or other suitable section. The central portion of the girder is carried by trusses $a\,a$, arranged one on either side thereof and connected therewith by means of two double cantalivers B. These double cantalivers are preferably in the form of two triangles, which project one on each side of and at right angles to the girder A, to the web of which they are riveted with the aid of gusset-plates b. Each of the two struts $b'\,b^2$, forming part of the triangle, rests at its apex upon the truss a at the side on which the cantaliver projects, the struts serving as a queen-post to the truss a. One strut b' is formed as a plate and is riveted to the lower flange of the girder A, the ends of the plate being secured to shoes $b^3\,b^3$, which rest upon the trusses $a\,a$, the girder A being hereby supported. The other strut b^2 is secured at one end to a casting C, preferably of steel, and at the other end is attached to the strut b' near its point of attachment to the shoe b^3. The bars b^4, which form the other side of the triangle, are attached at one end to the casting C and at the other end to the web of the girder A. There is also a tie-bar b^5 between the casting C and the gusset-plates b.

Between the two pairs of wheels at each end of the wagon are arranged the cantalivers D, of a character similar to that of the cantalivers B and which project from the girder A, the ends of the trusses $a\,a$ being attached to the cantalivers D by means of nuts a'. These cantalivers D may be constructed of plates and angle-irons and may be attached to the web and flanges of the main girder A by means of angle-iron in the ordinary manner.

The flooring of the wagon is partially borne by the cantalivers, the projecting ends of which carry a frame A', which may be of timber, or of iron or of steel. The flooring may be formed of timber, or of iron or steel plates and may be attached to the frame and girder by bolts or rivets.

To counteract the strain set up by any impact on the buffers, bars $a^2\,a^2$ are arranged along the sides of the frame A'. These bars pass through the castings C and are held in position therein by pins c, the extremities of the said bars being attached to the web of the girder A. Similar bars $a^3\,a^3$ are disposed diagonally between the castings C and the end cantalivers D, the end of the bars in juxtaposition to the cantalivers being attached to the web of the girder A, while the other end is attached to the casting by means of the pin c. The bars $a\;a^3$ thus transmit the strains to the girder A^2.

Upon the central cantalivers B are the rods a^4, which latter form a truss and by bearing upon the central cantalivers prevent the bending of the main girder. The ends of

the rods are attached to brackets d, secured to the under side of the end cantalivers D. The construction also prevents undue vibration and torsional stresses caused when the wagon is traveling.

The draw-gear may be of the combined central draw and buffing gear type or continuous. The hook e, for connecting one wagon with another, extends through the buffer-frame E and is attached to the end cantaliver D by means of long bolts e', the ends of which are provided with washers e^2. Between these washers and the web of the cantaliver D is placed a buffer, which may be of rubber or be a spring, as shown at e^3. Diagonal struts e^4 extend between the end portion of the frame E, which carries the buffer E' and the girder A.

The wheels may be of either the spoke or disk type and the axles and journals of any well-known pattern. The brakes may be of the hand or power type.

The strains set up by the weight of the wagon and of the load carried as well as those incidental to the rough work that railway-wagons are subjected to are simply provided for in this system of trussing and bracing. At the same time lightness is combined with simplicity of construction, thus considerably reducing the ratio of tare to load and cost of maintenance. In the event of the wagon meeting with any serious damage the parts can be easily replaced or the damaged bars straightened. The area of the floor available for loading such goods as cereals, baled wool, hay, &c., is, moreover, greater with this kind of underframe, thus allowing the wagon to be loaded to its full carrying capacity.

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

1. An underframe for railway-vehicles provided with a central main girder extending between the end portions of the frame and supported by means of cantalivers projecting laterally from and attached to the said girder, the said cantalivers being supported by trusses which have their ends attached to cantalivers at the said end portions, substantially as herein described.

2. An underframe for railway-vehicles constructed substantially as herein described and comprising a single central main girder, whereof the central portion is supported by double cantalivers projecting laterally from and attached to the said girder between its end or main supports, and by trusses extending longitudinally of the frame and whereof the extremities are also supported by double cantalivers similarly attached to the said girder, the latter cantalivers carrying the ends of the said trusses.

3. In an underframe for railway-vehicles, the improved means for supporting the flooring, same comprising a central main girder having cantalivers attached thereto and supported by trusses, and a frame attached to the extremities of the said main girder and of the cantalivers, substantially as herein described.

4. An underframe for railway-vehicles comprising a central main girder, central and end cantalivers for supporting the said girder, and bars a^2, a^3, substantially as herein described and whereby the strains incidental to the loading and traveling of the wagon are transmitted to the said girder.

5. An underframe for railway-vehicles provided with a central main girder A, central cantalivers B, and end cantalivers D, trusses a, a, and a^4, a^4 for said cantalivers and frame A', substantially as set forth.

6. An underframe for railway-vehicles provided with a central main girder A, central cantalivers B, and end cantalivers D, trusses a, a, a^4, a^4, bars a^2, a^3, and frame A', all arranged and operating substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PERCY GRANT.

Witnesses:
A. M. MILLER,
JUAN MIGUEN.