

A. E. SMITH.
CAR STRUCTURE.
APPLICATION FILED JUNE 18, 1909.

956,740.

Patented May 3, 1910.
3 SHEETS—SHEET 1.

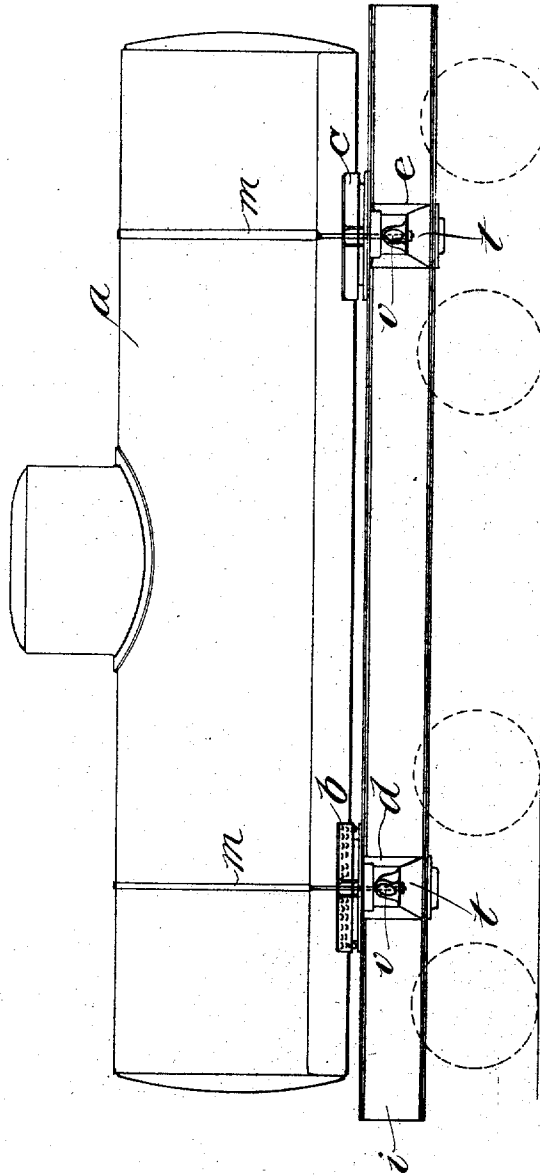


Fig. 1.

WITNESSES

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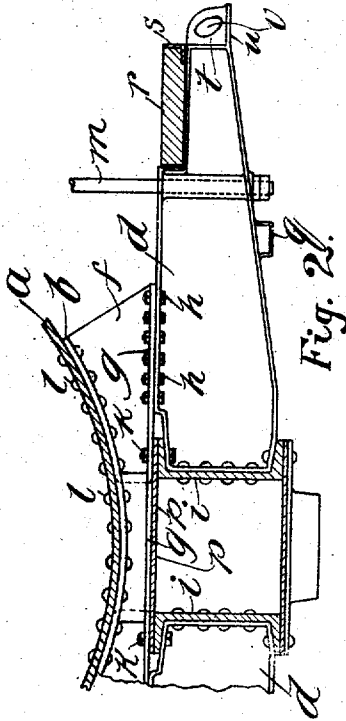


Fig. 2.

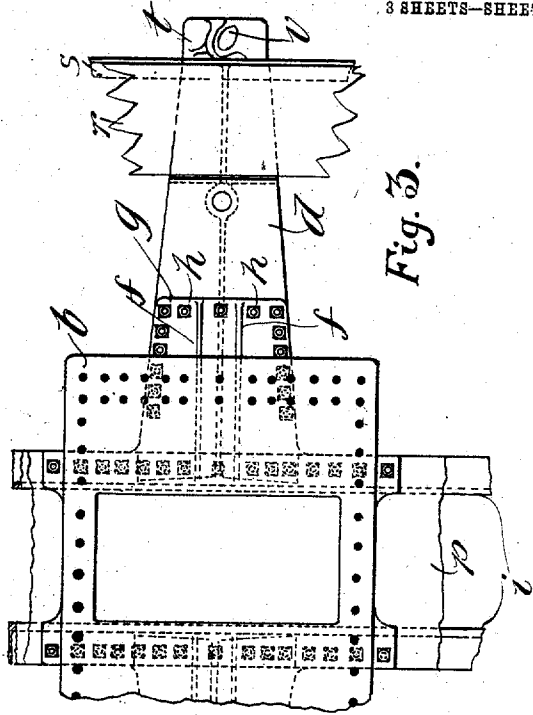


Fig. 3.

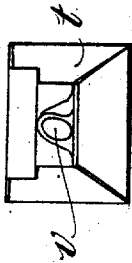


Fig. 4.

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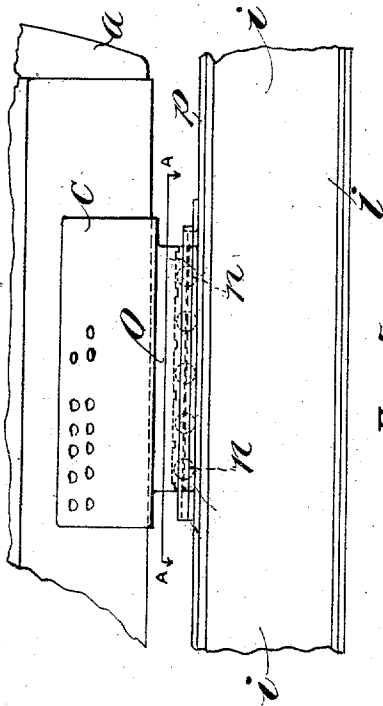


Fig. 5.

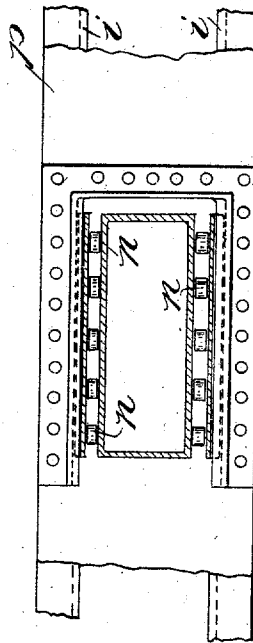


Fig. 6.

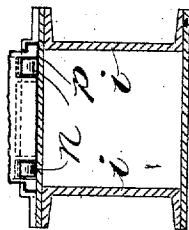


Fig. 7.

WITNESSES

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CAR STRUCTURE.

956,740.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ABRAM E. SMITH, citizen of the United States, residing at Brooklyn in the county of Kings and State of New York, have invented a certain new and useful Improvement in Car Structures, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to tank car structures, and has a number of objects and advantages in view which will clearly appear by reference to the accompanying drawings, showing preferred and modified characteristics of construction, to which construction, however, I do not wish to be limited.

In the drawings—Figure 1 is a side elevation showing a number of structural parts of the tank car made in accordance with the preferred embodiment of the invention. Fig. 2 is a view taken in cross-section through a body bolster, enough of the body bolster and enough of the tank being indicated to render clear the preferred construction of my invention. Fig. 3 is a plan view of the parts shown in Fig. 2, with the exception that the tank of the tank car is absent. Fig. 4 is an end view of the body bolster showing structural characteristics of my invention. Fig. 5 is a view in elevation showing a modification of the construction illustrated in Fig. 1. Fig. 6 is a sectional plan view on line A A of Fig. 5. Fig. 7 is a view in cross-section of a part of the structure shown in Fig. 5.

Like parts are indicated by similar characters of reference throughout the different figures.

Referring to Figs. 1 to 4, inclusive, the tank *a* of the car rests upon two saddles *b* *c* that are supported in some convenient way, preferably by being fastened to body bolsters *d* and *e*, to which end said saddles are each desirably provided with webs *f*, as shown in Figs. 2 and 3, and a base flange *g*, this base flange being bolted or otherwise secured at its outer ends to the tops of the bolster members *d*, *e*, all as indicated at *h*, inner portions of the base flange being fastened to the center sills *i* by bolts *k*, which pass through the base flange *g* and also through the outsetting upper flanges of the center sills *i*; the bolts *k* also passing through the inner ends of the bolster sections *d*, *e*. While the saddles *b* *c* are thus

desirably secured upon the sub-structure or under-frame of the tank car, only one of these saddles, say the saddle *b*, is fixedly united with the tank *a*, preferably by means of rivets *l*, which pass through the bottom of the tank and through the saddle *b*, the rivets being indicated in Fig. 2 while the rivet holes in the saddle are indicated in Fig. 3. The companion saddle *c* is not secured to the tank *a*, said tank merely resting upon the saddle and being in sliding relation therewith, so that as the tank is lengthened or shortened, in consequence of expansion and contraction, it may move with respect to the saddle *c* while it is fixed with respect to the saddle *b*, whereby contraction and expansion throughout the length of the tank may readily occur without tendency to buckle the tank and without tendency to loosen the tank where it is riveted to its supporting means. Thus I have devised a tank car including a tank which is fixedly secured near one end to the under-frame of the car structure, and which, while supported at its other end upon said under-frame, is adapted there to move longitudinally of the car structure and with respect to that part of the under-frame which supports the tank but which is not fixedly united with the tank. I employ tank bands *m*, one of which is located in the neighborhood of the saddle *c*, and which, at its ends, is united with a body bolster, as indicated in Figs. 1 and 2. This tank band *m*, while serving to permit the tank to move longitudinally of the car structure with respect to the saddle *c*, prevents said tank from rising from its saddle.

In Figs. 5, 6 and 7 the saddle *c* is riveted to the tank *a*, but is not fixed with respect to the under-frame, but is adapted to move longitudinally of the under-frame, to which end rollers *n* are interposed between the base of the saddle and the plate *p* that bridges the gap between the center sills *i*, and which is fastened thereto. Thus when there is contraction and expansion throughout the length of the tank, one end of the tank while being fixed, will not prevent the other end of the tank from moving with respect to the under-frame, so that the advantageous results hitherto specified are secured by the construction shown in Figs. 5, 6 and 7 as well as by the construction shown in Figs. 1, 2 and 3. The construction of Figs. 1, 2 and 3, however, is preferred.

The portions *g* of the saddle structures are projected so far laterally of the under-frame as to cause the outer portion of such saddle structures in engagement with the under-frame, to lie sufficiently outside of the tank and disposed between vertical lines passing through the side bearings so as to cause side thrusts to be transmitted to the tank when the car is rounding curves; thus distributing the side stresses. By reference to Fig. 2 it will be seen that a line drawn through the side-bearing there shown and the outer end of the base flange *g*, will be so far to one side of the axis of the tank as absolutely to prevent this portion of the saddle structure from acting as a fulcrum.

There are two body bolsters for the construction illustrated; each body bolster being desirably formed as shown in Figs. 2 and 3, where the body bolsters are illustrated as being made up of two outer sections *d* which are riveted along their vertical inner faces to the vertical webs of the center sills *i*, the upper face of the plate *p* being on the same level with the uppermost horizontal surfaces of the body bolster, the upper portions of the inner ends of the body bolster sections *d* thus fastened to the center sills being downwardly depressed to permit of the interposition of the upper center sill flanges between the upper inner portions of the body bolster sections and the base flange *g* belonging to the structure of the saddles *b c*. Each body bolster is provided with a pair of side bearings, one such side bearing *q* being indicated in Fig. 2. The outer ends of the body bolsters are recessed to receive a running-board *r*, the recesses in the body bolster permitting the upper level of the running-board to lie substantially in the same plane with the top faces of the body bolsters. The running-board is margined along its outer longitudinal edge by an angle-iron *s*, that serves to stiffen the running-board. I have indicated but one running-board, but it is obvious that a running-board should be provided along each side of the tank and around the ends of the car. The body bolster sections are elongated to accommodate the running-board, the anchored ends of the tank bands being located between the running-board and the center sills. The lower faces of the body bolsters from which the side bearings *q* project, slope downwardly toward the center of the car, as indicated most clearly in Fig. 2, these sloping surfaces being ill adapted to the application of jack-screws or levers, on which account I provide outer end extensions *t* of the body bolsters, the under surfaces *u* of which are substantially horizontal, and, therefore, angular with respect to the lower sloping faces of the body bolsters, the surfaces *u*, by being horizontal and by projecting sufficiently beyond the body

bolster proper, very readily permitting of jack-screw or lever engagement. The extensions *t* not only serve to afford the jack-screw-engaging surfaces *u*, but have sufficient body to permit of the formation of push-pole-pockets *v* therein.

It is obvious that changes may readily be made in the device of my invention as herein shown and particularly described, without departing from the spirit thereof.

Having thus described my invention, I claim as new and desire to secure by Letters Patent the following:—

1. A car structure including a tank, an under-frame therefor, longitudinally of which the tank extends, and two tank supports beneath the tank, to one of which supports the tank is rigidly secured, and which support is supported by a body bolster belonging to the under-frame, whereby the tank is fixed with respect to the under-frame where it engages said support, the tank being free to slide upon the companion tank support thereby permitting longitudinal movement of the portion of the tank carried thereby with respect to the under-frame, whereby expansion and contraction of the tank longitudinally thereof may occur without rupture.

2. A car structure including a tank, an under-frame therefor, longitudinally of which the tank extends, and two tank supports beneath the tank, one adjacent to each end thereof, to one of which supports the tank is rigidly secured, and which support is rigid with respect to the under-frame, whereby the tank is fixed with respect to the under-frame where it engages said support, the companion tank support permitting longitudinal movement of the portion whereby the tank is fixed with respect to the under-frame, whereby expansion and contraction of the tank longitudinally thereof may occur without rupture.

3. A car structure including a tank, an under-frame having two body bolsters and two tank supports, one carried by each body bolster, to one of which supports the tank is rigidly secured, and which support is rigid with respect to the body bolster carrying it, whereby the tank is fixed with respect to the under-frame where it engages said support, the companion tank support permitting longitudinal movement of the portion of the tank carried thereby with respect to the under-frame, whereby expansion and contraction of the tank longitudinally thereof may occur without rupture.

4. A car structure including a tank, an under-frame having two body bolsters and two tank supports, one carried by each body bolster; to one of which supports the tank is rigidly secured, and which support is rigid with respect to the body bolster carrying it, whereby the tank is fixed with respect to

the under-frame where it engages said support, the companion tank support permitting longitudinal movement of the portion of the tank carried thereby with respect to the under-frame, whereby expansion and contraction of the tank longitudinally thereof may occur without rupture, and a tank band having its ends in engagement with the body bolster and passing over the tank in the neighborhood of its said second support to hold the tank upon the second support while permitting the aforesaid longitudinal movement of the tank.

5. A car structure including a tank, and an under-frame therefor longitudinally of which the tank extends, said tank being rigidly attached near one of its ends to the under-frame and being free to move longitudinally of the under-frame throughout the portion of its length from its said place of attachment to its other end upon expansion and contraction of the tank.

6. A car structure including a tank, an under-frame therefor, longitudinally of which the tank extends, two tank supports beneath the tank, one adjacent to each end thereof, to one of which supports the tank is rigidly secured, and which support is rigid with respect to the under-frame, whereby the tank is fixed with respect to the under-frame where it engages said support, the companion tank support permitting longitudinal movement of the portion of the tank carried thereby with respect to the under-frame, whereby expansion and contraction of the tank longitudinally thereof may occur without rupture, and a tank band passing over the tank in the neighborhood of its second support and anchored to the under-frame to hold the tank upon the second support while permitting the aforesaid longitudinal movement of the tank.

7. A car structure including a tank, an under-frame therefor, longitudinally of which the tank extends, body bolsters included in the under-frame, the outer ends of which are recessed at their top portions, and a running-board received in the recessed portions of the body bolsters, the recesses in the body bolsters being of such a depth as to cause the upper surface of the running-board and the contiguous upper surface of the body bolsters to lie substantially in the same plane.

8. A car structure including a tank, an under-frame therefor, longitudinally of which the tank extends, body bolsters included in the under-frame, the outer ends of which are recessed at their top portions, a running-board received in the recessed portions of the body bolsters, the recesses in the body bolsters being of such a depth as to cause the upper surface of the running-board and the contiguous upper surface of the body bolsters to lie substantially in the same plane, and tank bands having end portions anchored to the body bolsters between said running-board and the tank.

9. A car structure including a tank, and an under-frame therefor longitudinally of which the tank extends, said tank being rigidly attached to a body bolster belonging to the under-frame and being free to move longitudinally of the under-frame throughout the remainder of its length from its said place of attachment upon expansion and contraction of the tank.

In witness whereof, I hereunto subscribe my name this 10th day of June A. D., 1909.

ABRAM E. SMITH.

Witnesses:

LOUIS V. H. ALBERS,
G. A. RAYNOR.