

A. E. SMITH.
TANK CAR.
APPLICATION FILED FEB. 23, 1921.

1,432,497.

Patented Oct. 17, 1922.

3 SHEETS—SHEET 1.

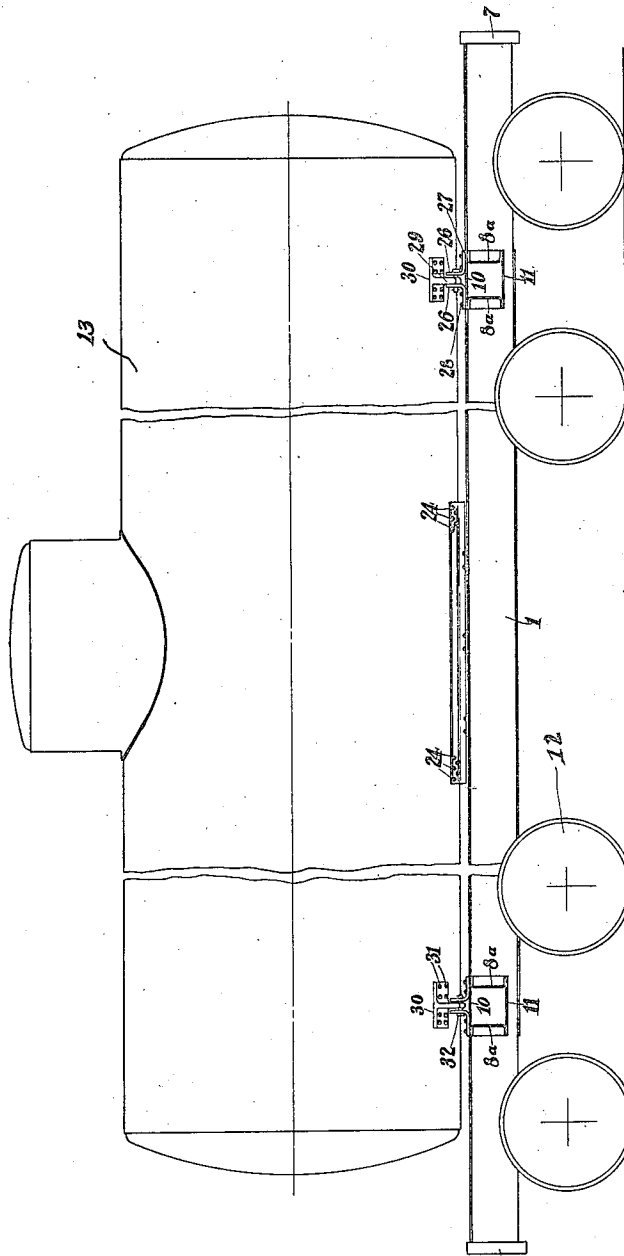


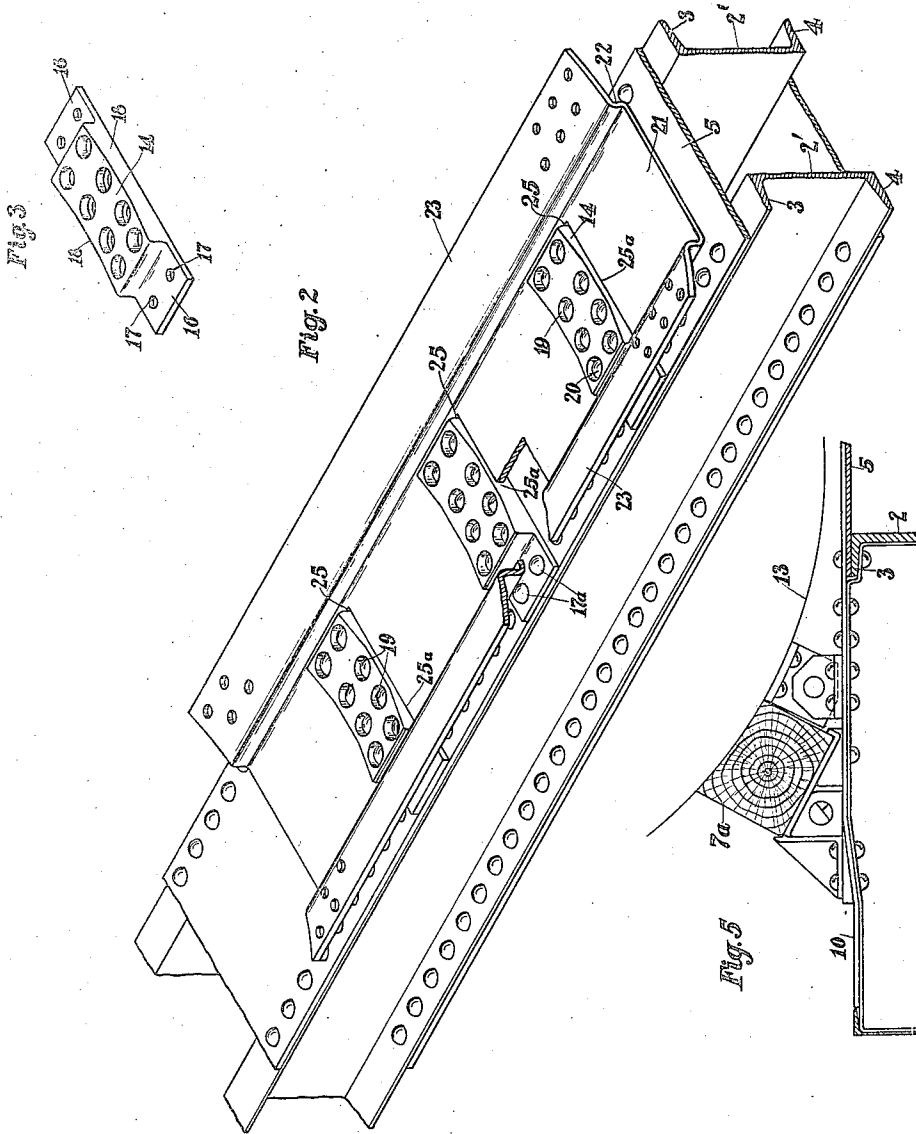
Fig. 1

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BY *Gifford Bull*
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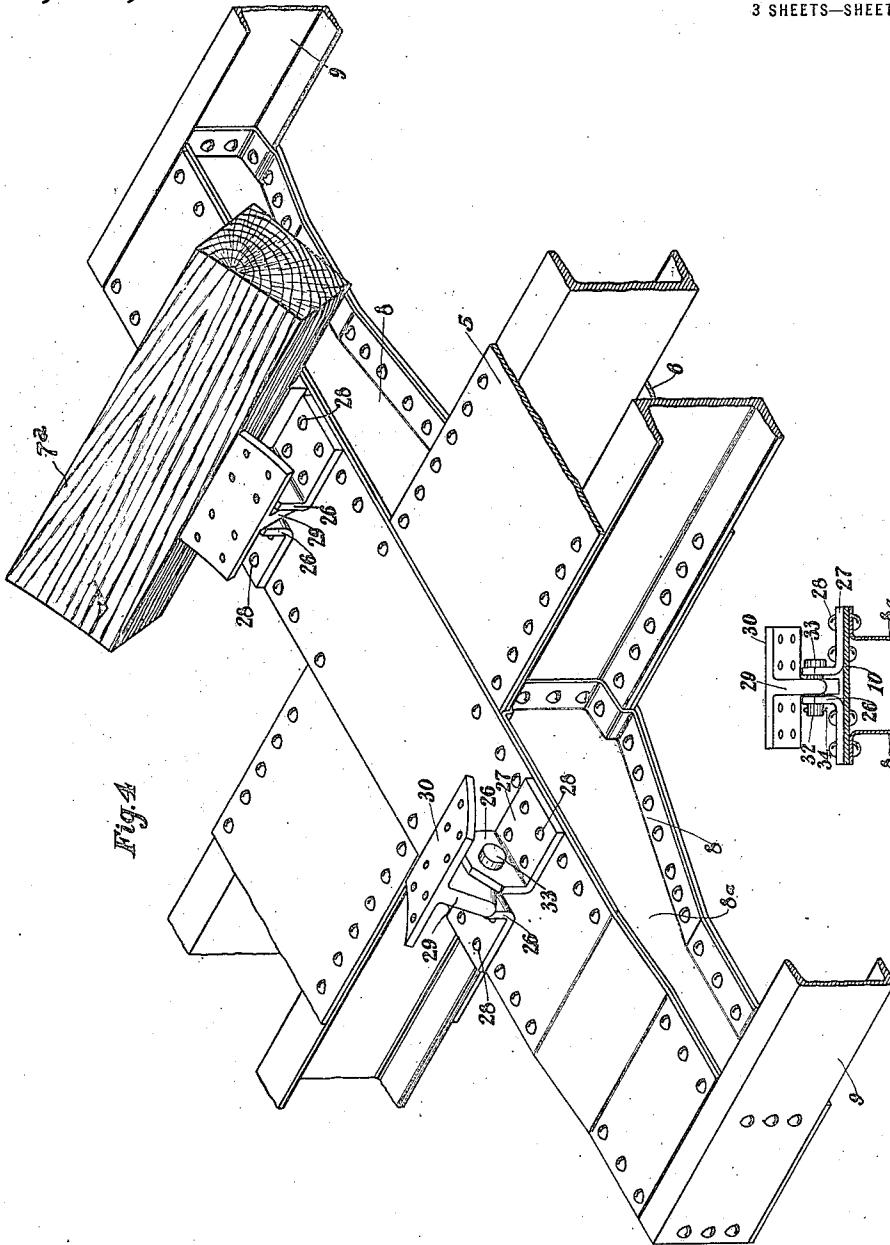


Fig. 4

Fig. 6

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UNITED STATES PATENT OFFICE.

ABRAM E. SMITH, OF NEW YORK, N. Y.

TANK CAR.

Application filed February 23, 1921. Serial No. 447,178.

To all whom it may concern:

Be it known that I, ABRAM E. SMITH, a citizen of the United States, residing at New York city, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Tank Cars, of which the following is a specification.

My invention relates to tank cars, and particularly of that character or type generally employed for railway transportation of liquids in bulk, and which comprises a horizontally disposed cylindrical tank supported upon an underframe which, in turn, is mounted on wheeled trucks.

The invention consists in the improvements to be more fully described hereinafter and the novelty of which will be particularly pointed out and distinctly claimed.

I have fully and clearly illustrated a preferred embodiment of my invention in the accompanying drawings to be taken as a part of this specification, and wherein—

Figure 1 is a view in side elevation of one embodiment of my invention and so much of a car structure as is necessary to illustrate the application of the invention thereto; certain parts of the car structure being omitted for the sake of clearness;

Fig. 2 is a perspective view of a connection constituting my invention, for connecting the tank to the underframe of a car and preventing longitudinal bodily movement of the tank relative to the underframe;

Fig. 3 is a detailed perspective of one of the elements forming part of the connection shown in Fig. 2;

Fig. 4 is a detailed perspective view of a portion of the underframe of a car and showing means constituting my invention, for connecting a tank to the underframe in such manner as to prevent vertical movement of the tank relative to the underframe;

Fig. 5 is a detail view showing the connection of Fig. 4 in side elevation, and the preferred location of the same relative to the understructure; and

Fig. 6 is a detail view in front elevation of the connecting means shown in Fig. 4.

Before describing my invention in detail, I would state that while I have shown the same applied to a well-known type of car underframe, I wish it understood that my invention is not limited to this type of underframe as it contemplates within its scope any

type of underframe to which it may be applicable.

Referring to the drawings by characters of reference, 1 designates generally the underframe or understructure of a well-known type of car, the same being shown as consisting of a center sill or structure 2 made up of structural members consisting preferably of channel irons or girders arranged with their body portions or webs 2' spaced from each other in vertical parallel planes and with the side flanges 3, 4, thereof extending outwardly from the upper and lower edges of the webs. The vertical girder members described are connected by upper and lower horizontal plates 5, 6, resting respectively on the outer faces of the flanges 3, 4, and secured rigidly thereto by means of rivets passing through the side edges of said plates and through said flanges, whereby a rigid tubular structure is provided.

The said center sill extends preferably the entire length of the car and is connected at its end to end sills 7 in any well-known manner (not shown). At its opposite ends the underframe is provided with suitable bolsters 8, which may be of any suitable commercial type, for example, a built-up structure consisting of flanged vertical members 8^a secured at their inner ends to the center sill by rivets or other suitable means, and at their outer ends to the longitudinal side members 9, said vertical members 8^a being connected by upper and lower horizontal plates 10, 11. The underframe is supported, in any suitable manner, upon wheeled trucks (not shown) carrying running wheels 12 adapted to travel upon a railway track.

13 designates a tank body which may be of any suitable construction, the same being preferably cylindrical in form, and arranged over the underframe and adapted to rest on saddle blocks 7^a on the bolsters 8 (one of said saddles being shown in each of Figs. 4 and 5), the longitudinal axis of said tank extending longitudinally of said understructure. It will be understood that two saddles are employed on each bolster. For the sake of clearness the saddle members have been omitted from Fig. 1 of the drawings. My invention contemplates improved and simplified means for connecting the tank body to the understructure, whereby the tank will be held at the point of connection against longitudinal movement relative to the un-

derstructure, but which will permit ready installation of the tank in place on the underframe or removal therefrom. This means is preferably located at the center portion of the tank body so as to act as an anchor for that portion and serve to permit longitudinal expansion and contraction of the opposite end portions of the tank body relative to said connection. This connection comprises a plurality of block members 14 preferably independent of each other, and mounted on the upper side of the center sill in spaced relation longitudinally of the latter. Each of these block members is preferably rectangular in form, for example, oblong, and arranged with its greatest length extending transversely of the center sill, the arrangement being such that each block extends on opposite sides of the longitudinal axis of the tank body and center sill. The under side of the block is preferably flat so as to lie flat upon the upper surface of the plate 5, and is provided with end extensions or wings 16 having rivet holes 17 to receive rivets 17^a passing through the plate 5, and flanges 3, for the purpose of rigidly attaching the block to the center sill. The blocks are of sufficient width and vertical thickness to form substantial rigid abutments, and are each formed with vertical side faces 18 constituting abutment faces, in a manner to be presently described. The upper faces of the blocks are curved inwardly and transversely of the underframe to conform substantially to the contour of the tank, and so as to be cleared by the bottom of the tank which, as stated, is supported on the saddles 7^a. The body of the block is provided preferably with apertures 19 to receive rivets 20 for connecting the block to the upper plate 5 of the undersill.

Upon the under face of the tank body is rigidly secured a member adapted to set over or receive the abutment blocks just described, and to cooperate therewith to provide a connection preventing lengthwise movement of the center portion of the tank relative to the underframe. This member consists of a longitudinally arranged web or plate 21, which may be oblong in plan, and flat, so that it lies throughout its body in a horizontal plane. This plate is secured to the under portion of the tank body between the latter and the center sill, and over that area of the latter upon which the block members 14 are located, said plate being provided with vertical longitudinal side flange portions 22 carrying integral side flanges 23 adapted to rest against the under side of the tank wall and be secured thereto by rivets 24 of suitable number, to form a secure and rigid connection between the plate and the tank body. Formed in the plate 21 are a plurality of openings 25 of substantially the same, but slightly greater area, than the

raised portion of the blocks 14, said apertures corresponding in number, and individually in contour, to the blocks employed, and adapted to individually receive said blocks, as shown in Figure 2, when the tank is in position on the underframe, said openings being separated by transverse web portions 19^a constituted by the body of the plate 21, which web portions normally lie in a horizontal plane. The member 21, together with its flanges 22 and 23, is preferably made by stamping or pressing the same from a blank of sheet steel of proper strength and thickness to serve the purpose for which it is devised, namely, to cooperate with the blocks to hold the tank body loaded against lengthwise movement on the understructure. The blocks 14 are preferably made of solid and substantial castings or forgings, so as to retain their shape, and not be distorted or broken under forces exerted thereon by engagement therewith of the plate member 21. The member 21, it will be noted, is arranged with its longitudinal center in line with the longitudinal axis of the tank body and the center sill.

It will be seen that by reason of the flanges 22, the plate 21 will be spaced from the underside of the tank wall and that the blocks 14 will project through the openings in said plate into the space between the latter and the tank body. It will also be seen that the transverse edges 25^a of the openings in the plate 21 will abut the vertical side faces 18 of the abutment blocks, whereby longitudinal movement of the tank body relative to the underframe will be prevented at the point of connection, although the end portions of the tank body may expand and contract relative to the connection, due to temperature changes. While I have shown the connection just described as employed as a center connection or anchor, I wish it understood that the invention is not so limited, as the invention includes the employment of such connection at any point lengthwise of the tank body. It will be readily appreciated that the connection described affords efficient means for holding the tank body against endwise bodily movement relative to the underframe, but that the body may be conveniently assembled on the underframe and removed therefrom by vertical movement of said body relative to the underframe. It will be seen that the tank body may be removed from the underframe without cutting or removing any of the rivets which connect the anchor elements to the tank and underframe, respectively.

I also provide improved means for securing the end portions of the tank body to the underframe, so as to limit or prevent vertical and sidewise movement of the body relative to the underframe, but permitting longitudinal movement of the said end portions

due to temperature changes. This connection in its preferred embodiment comprises pairs of vertically disposed members 26, the members of each pair being arranged, respectively, in spaced relation, and in parallel planes extending transversely of the underframe, and each of said members being connected to the underframe by a base flange 27 rigidly secured by rivets 28 to the cover plate 10 forming part of the bolster structure heretofore described. These pairs of members 26 are located, respectively, on opposite sides of the longitudinal axis of the underframe, as clearly illustrated in Fig. 4 of the drawings. Secured to the underportion of the tank body at a point over the bolsters, are depending ears or lugs 29, each of which is integral with a securing member in the form of a flange 30, which is rigidly secured by means of rivets 31 to the tank body, whereby each of said members 29 is rigidly and immovably connected to the latter. Each member 29 projects into the space between a pair of the members 26, and is of a thickness less than the width of said space, as clearly illustrated in Figs. 1 and 4, so that the member 29 may have sufficient movement or play between the inner vertical faces of said members 26 when the tank body expands and contracts lengthwise of the underframe relative to the center connection. Each of the members 29 is secured to its pair of securing members 26 by means of a cross bolt or pin 32 extending through alining openings in said members 26 and that portion of the member 29 arranged between said members 26 so that the member 29 may move longitudinally of the underframe, as heretofore described, but is held against vertical movement, thereby preventing vertical movement of the tank body relative to the underframe. The pins 32 are each preferably in the form of a headed bolt, the head 33 of which is located on the outer side of one of the members 26, and which bolt is held in place by means of a cotter-pin 34 on the opposite end of said pin from the head and the outer side of the other member 26 of the pair. The hole in the member 29 through which the bolt projects is made large enough to permit free longitudinal movement of the tank body. This connection is not only simple and effective in structure, but eliminates the necessity of tank bands commonly used in tank car structure, and the disadvantages of which are well-known.

What I claim and desire to secure by Letters Patent of the United States is:

1. In a tank car, an underframe, a tank body and a connection between said tank body and underframe, said connection comprising a plurality of spaced blocks on the underframe, said blocks each extending on opposite sides of the longitudinal axis of the

tank body, and a plate member carried by the tank body and spaced therefrom, said plate member having openings therethrough extending on opposite sides of the longitudinal axis of the tank body and receiving said blocks.

2. In a tank car, an underframe, a tank body and a connection between said tank body and underframe, said connection comprising a plurality of spaced blocks rigidly fixed on the underframe and extending on opposite sides of the longitudinal axis of the underframe, and a plate member extending on opposite sides of the longitudinal axis of the tank body and underframe and having flanges secured to the tank body by rivets, and said plate member being spaced from the tank body and having openings therethrough receiving said blocks.

3. In a tank car, a center sill, a tank body and a connection between said tank body and center sill, said connection comprising a plurality of spaced rectangular blocks independent of each other and arranged over the center sill and rigidly connected thereto, said blocks each extending on opposite sides of the longitudinal axis of said sill, and a plate member rigidly connected to and carried by the tank body and spaced therefrom, and having spaced openings therethrough and extending on opposite sides of the longitudinal axis of the tank body and sill, said openings receiving said blocks.

4. In a tank car, an underframe, a tank body and a connection between said tank body and underframe, said connection comprising a plurality of spaced independent blocks secured independently of each other to the underframe, each block having parallel opposite abutment faces arranged transversely of the underframe, and a plate member rigidly connected to the tank body and having spaced openings therethrough receiving said blocks, said openings being separated by web portions of said plate member and having transverse parallel walls adapted to cooperate with the said abutment faces on the said blocks.

5. In a tank car, an underframe, a tank body and a connection between said tank body and underframe, said connection comprising a plurality of independent spaced rectangular blocks secured independently of each other to the underframe and extending on opposite sides of the longitudinal axis of the underframe, said blocks having parallel transverse abutment faces, and end flanges secured by rivets to the underframe, and a plate member carried by the tank body and spaced therefrom and extending on opposite sides of the longitudinal axis of the tank body, and having openings receiving said blocks, said openings having transverse parallel walls cooperating with the abutment faces on said blocks to limit endwise move-

ment of the tank body relative to the underframe.

6. In combination, an underframe including a center sill composed of channel members having side flanges respectively, a tank body, and means for connecting the tank body and underframe to prevent longitudinal movement of the tank body relative to the underframe, said means comprising a plurality of independent spaced rectangular blocks overlying and resting upon the center sill and extending on opposite sides of the longitudinal axis of the center sill, said blocks having end flanges secured by rivets to the flanges on the said girders, a plate member carried by the tank body and comprising a central flat portion spaced from the tank body and having longitudinal side

flanges secured by rivets to the tank body, said central portion having transverse openings extending on opposite sides of the longitudinal axis of the center sill and receiving said blocks, said openings being separated by web portions of said central plate portion and having transverse parallel walls cooperating with the transverse abutment faces on said blocks to limit endwise movement of the tank body relative to the center sill.

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

ABRAM E. SMITH.

Witnesses:

AGNES E. CUNNEEN,
C. S. HEYLMUN.