

June 25, 1968

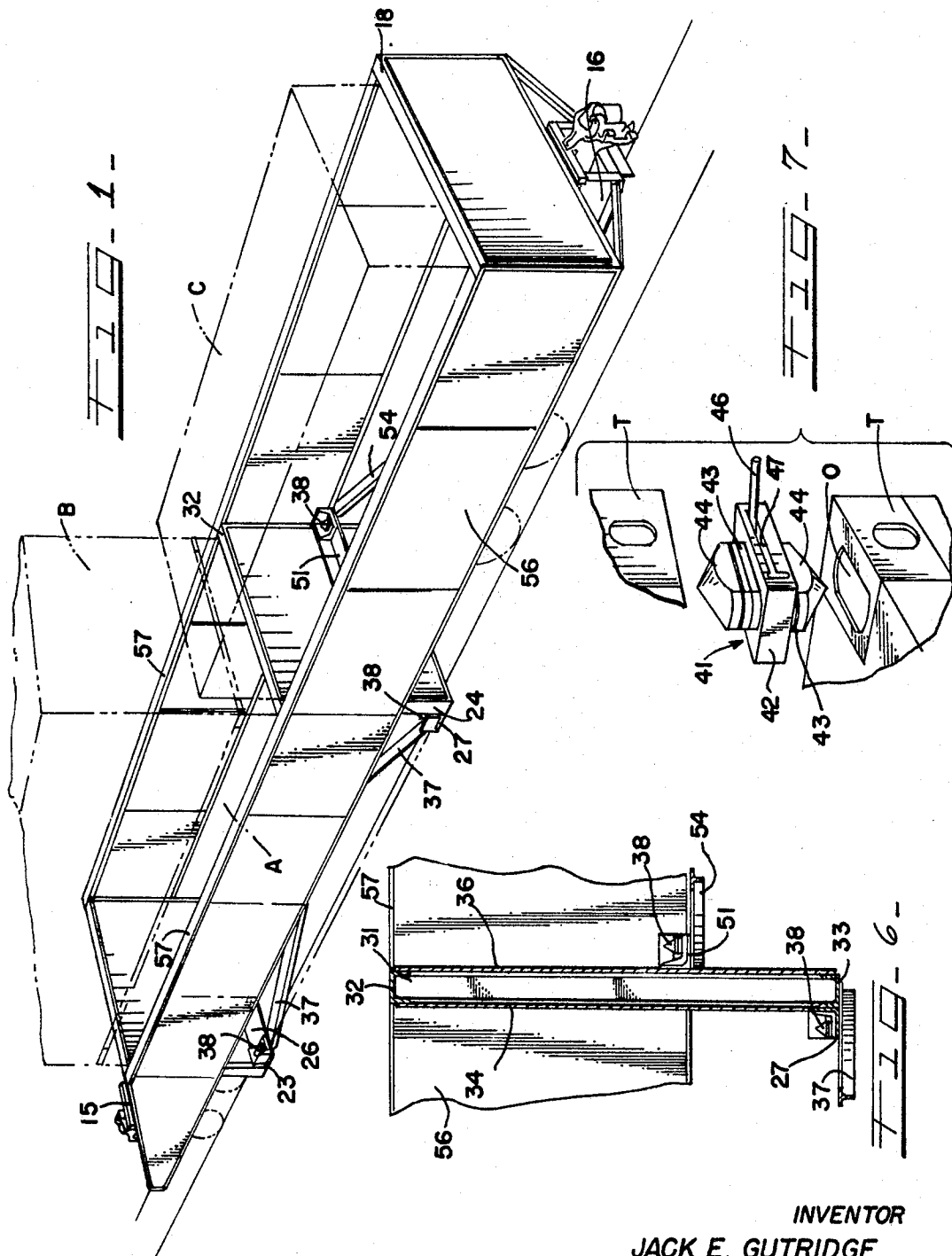
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3,389,663

CONTAINER CAR CONSTRUCTION

Filed Aug. 1, 1966

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

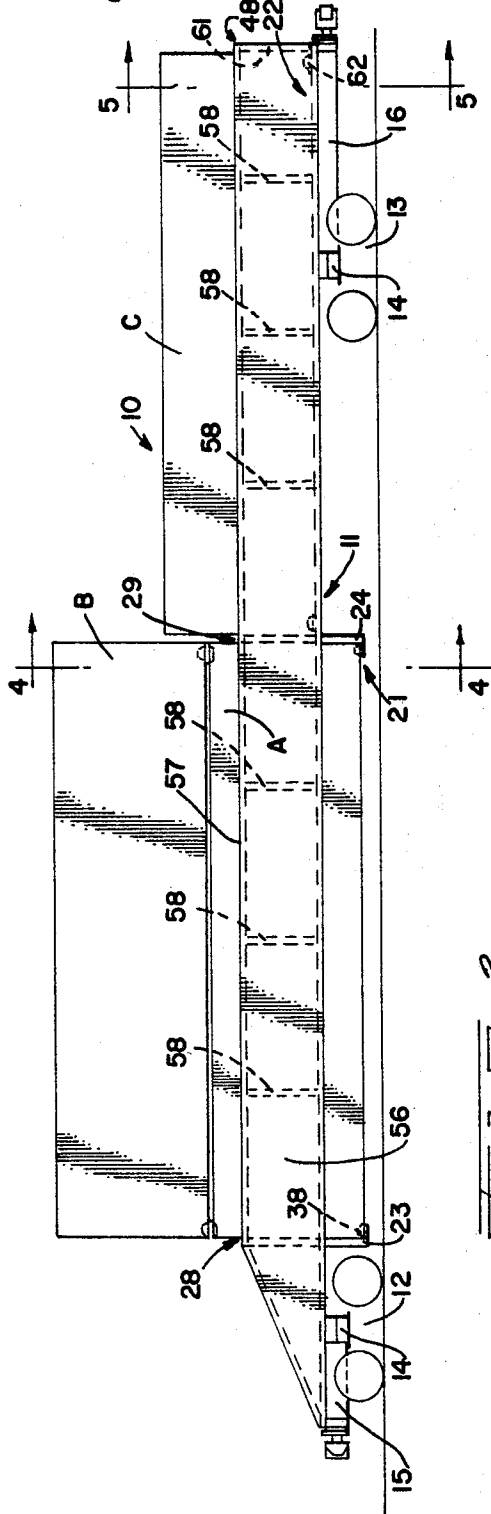


FIG. 2

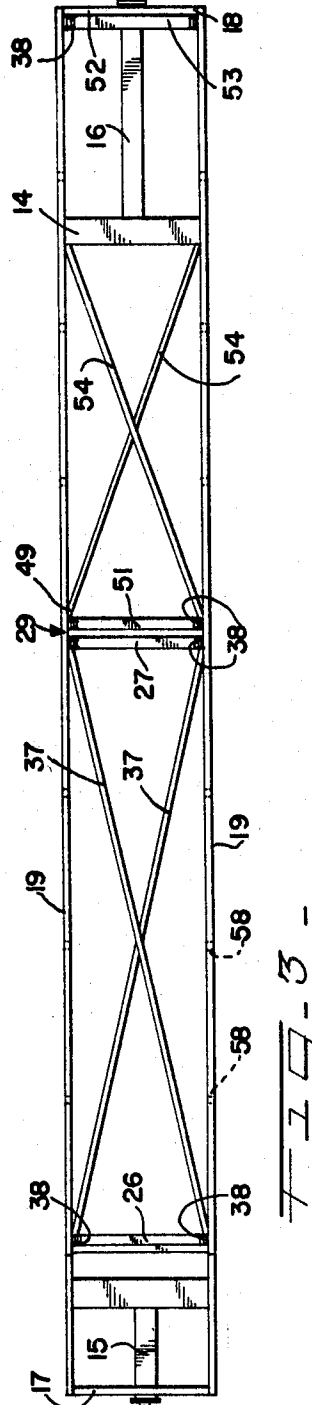


FIG. 3

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3,389,663

CONTAINER CAR CONSTRUCTION

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5 Claims. (Cl. 105—366)

The present invention relates to railway cars and more particularly to a railway car of the type adapted to transport cargo containing containers thereon. Cargo van containers of the type with which the present invention is related are of a modular group of containers which are constructed to provide carriers and shippers alike with an economical and flexible means of transporting freight interchangeably among marine, rail, highway and air services. To this end the containers have been designed and constructed to accommodate the currently accepted methods of handling and securing means used in the various modes of transportation.

Essentially the cargo van containers are of substantially standardized construction having a nominal cross section dimension of 8 feet x 8 feet and a nominal length dimension varying from about 10 feet to 40 feet and having gross weights varying from about 22,000 to 67,000 pounds.

To minimize the empty weight of this container and thereby to maximize the carrying capacity thereof, the containers are characterized by being of substantially frameless construction using a panel type structure to form the roof, base, sides and ends, of which one of the ends is formed as a door. The construction is such as to achieve sufficient structural strength capable of withstanding without permanent deformation the static and dynamic loads imposed by top corner pick-up, stacking and the impact shock and rack stresses encountered in normal carrier use.

The containers each further include corner fittings of substantially standardized construction and are designed and constructed for the purpose of engagement with lifting devices, registering or indexing means and securing devices on the railway flat cars, highway vehicles and ship decks and hatches. In this connection it should be noted that because of the substantially frameless structure of the containers, the containers are stacked in corner to corner relationship so that the stresses of the stacking are imposed thereon. To this end the corner structure and the corner fittings are constructed so as to be compatible with each other and to withstand the static and dynamic loads to be encountered when the containers are in stacked relationship in transit.

Currently, containers of a length in excess of 20 feet are commonly employed for over the road and rail transport. When the 20 foot containers are used in over the road operation, the containers may be connected in tandem so as to form in effect a multiple length container of approximately 40 feet.

In rail transport the number of multiple lengths of 20 foot and above containers which may be hauled is limited by the design limitation of the length of a railway car. Because of railway track curvature and other factors, railway cars are limited to lengths not exceeding about 98 feet.

A further factor in the construction of railway cars is the height limitation imposed by the American Association of Railroads which dictates a maximum height of about 18½ feet and under no circumstances greater than 19 feet. Moreover, the gross weight of containers to be transported on railway cars is such that high capacity trucks are required. These high capacity trucks usually have a wheel diameter of about 38 inches so that the floor level of car overlying the trucks is required to be in excess of 3½ feet above the track level. When the 8 foot height containers are stacked in dual relationship on a car on

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the floor sections overlying the trucks, it is readily apparent that the stacked height thereof is in excess of that dictated by the AAR. Efforts have been made to construct a car with a depressed portion intermediate the truck of the car so as to provide a supporting surface below the wheels whereby the overall height of the stacked containers falls within the height limitation. Such a car is exemplified in applicant's co-pending application, Ser. No. 447,340, filed Apr. 12, 1965, now Patent No. 3,357,371. However, because maximum distance between the truck centers is required to be no greater than about 60 feet, it is readily apparent that dual stacked containers of this length would carry a gross weight of about 200,000 pounds so that the car is loaded below its carrying capacity.

It is an object of the present invention to provide a railway car particularly adapted for the transporting of containers and which is constructed and arranged so as to permit the carrying of a length of containers in excess of the length of the car in a partially dual stacked single row relationship with the containers located to uniformly distribute the load between the two trucks of the car.

In the drawings:

FIG. 1 is a perspective view of a railway car constructed in accordance with the principles of the present invention and showing the containers supported thereon;

FIG. 2 is a side elevational view of the railway car shown in FIG. 1;

FIG. 3 is a top plan view of the railway car;

FIG. 4 is cross sectional view taken generally along the lines 4—4 of FIG. 2;

FIG. 5 is a cross sectional view of the railway car taken generally along the lines 5—5 of FIG. 2;

FIG. 6 is a fragmentary cross sectional view of the railway car taken generally along the lines 5—5 of FIG. 4 and showing in particular the construction of the railway car at a bulkhead disposed between the dual stacked container carrying section and the single line carrying section; and

FIG. 7 is a fragmentary perspective view of an arrangement for indexing and locking the adjacent corners of stacked containers.

Referring now to the drawings, and in particular to FIGS. 1 and 2, there is shown a railway car 10 including an underframe 11 supported on a pair of lengthwise spaced trucks 12 and 13 which are suitably fastened to the underframe 11 as by bolsters 14.

The underframe comprises a pair of center or draft sills 15 and 16 located at each end of the car. The draft sill 15 extends between an end sill 17 and the bolster 14. At the other end the draft sill 16, which is of greater length than the draft sill 15 for reasons which will become more apparent hereafter, extends between an end sill 18 and the adjacent bolster 14. Connected to the ends of the end sills 17 and 18 and to the respective ends of the bolsters 14 are lengthwise extending side sills 19.

To carry a maximum length of fully loaded containers within the gross rated carrying capacity of the car 10, the lading supporting structure thereof is formed to include a section 21 for carrying dual stacked containers A and B and a section 22 for carrying a single level row of containers C.

In view of the fact that it is common practice to transport containers having a nominal length dimension of 20 to 40 feet, it is desirable that the dual stacked container section 21 be formed of a length to accommodate as many of these containers as possible. The total length of the dual container's supporting section is limited to a distance of about 60 feet. This limitation is dictated by the maximum distance between the truck centers and the truck lengths. Moreover, the height of the containers on the car must be less than 19 feet, preferably about 18

feet above the track level to comply with regulations relating to overhead and track clearances.

Accordingly, the dual stacked container section 21 is disposed intermediate the trucks 14 and as shown includes a container support structure including a pair of transversely extending angle members 23 and 24 having horizontal ledges 26 and 27, respectively. The angle members 23 and 24 are fixed to the lower ends of transversely extending and longitudinally spaced and transversely extending spaced partitions 28 and 29, respectively, which are each defined as shown in FIGS. 4 and 6 by side posts 31 in the form of channels which are connected at the upper and lower ends thereof by transversely extending channel members 32 and 33. Intermediate the ends and at the upper ends thereof the side posts 31 are fixed to the side sills 19 and a top chord 47 respectively. Fixed to each of the channels and side posts 31 and transversely spaced intermediate reinforcing posts 35 are end wall sheets 34 and 36 which impart lateral stability to the car. Extending diagonally across the underside of the support angles 23 and 24 and the partition channels 33 are diagonal braces 37.

Fixed to the horizontal ledges 22 and 27 are containers indexing and locking members 38 which may be of the conventional type including a turnable head which in one position serves to index the container by way of engagement within usual openings in the corner fittings. In a second position the heads serve to lock the container on the car.

It is to be noted that the mounting ledges 26 and 27 are disposed below the coupler line of draft of the couplers a sufficient distance so that when the containers A and B are arranged in dual stacked relationship, as shown, the overall height thereof is within the clearance limits set by the AAR. To facilitate the stacking of two containers there may be used the indexing and latching arrangements 41 shown in FIG. 7. The indexing and latching arrangement 41 comprises a central plate 42 having a pair of sector-like plates 43 fixed to the opposite faces thereof. Turnably mounted on the central plate 42 are indexing and locking heads 44 which are turnable from an indexing position, as shown, to a locked position by means of a handle 46 extending through a slot 47.

Prior to placing the container B on the lower container A, the indexing and locking heads 43 on the underside of the central plate 42 are inserted into the openings O of the corner fittings T. Thereafter, the container to be stacked is lowered onto the first container so that the openings in the corner fittings receive the upper indexing heads 44. The handle 46 is then actuated to turn both heads 44 so that the latter overlie the marginal edges of the respective corner fitting openings O and thereby hold the containers A and B clamped together.

The single row container carrying section 22 is defined at one end by the partition 29 and at the other end by an end wall 48. The end wall 48 as shown in FIG. 5 includes an upper channel member 59 which extends between and is fixed to the top chord channel 57. End wall sheets 61 and 62 may be fixed to the channel 49, top chords 57 and side sills 19. Fixed to the partition 29 so as to support the container C on a level substantially coplanar with the top of the bolster 14 and the draft sill 16 is a transversely extending support angle 49 having a horizontal supporting ledge 51. A second angle member 52 having a horizontal ledge 53 is fixed to the inner face 61 of the end wall 48 and to the side sills 19. Extending between the bolster 14 and the partition 29 are diagonal braces 54. Mounted on the horizontal ledges 49 and 53 are indexing and locking members 38 which serve to index and lock the container C on the car as heretofore described in connection with the dual stacked container section 21.

Extending lengthwise of the car are side sheets 56—56 fixed adjacent the bottom edges to the side sill and at the upper edges to chord members 57—57. Fixed between

the top chords 57—57 and the side sills 19—19 are longitudinally spaced side stakes or posts 58.

The car is constructed and arranged such that the center of gravity thereof lies substantially midway between the center line of the trucks. At the same time the arrangement of the dual stacked container section 21 and single row section 22 results in dividing the load of the dual stacked containers substantially equally between the two trucks. This is accomplished by locating the single level container section so that the center of gravity of the full rated load capacity of the length of the container C is located approximately over the truck 14 adjacent to the draft sill 16. The sum of the full rated load capacity of the dual stacked containers A and B is an even multiple of the full total rated load capacity of the single level container C in a ratio of at least 2:1 and the dual stacked containers A and B and the single level container C are located relative to each other so that the sum of the full rated or gross capacity of the containers A, B and C lies in close proximity to the center of gravity of the car.

In achieving this relationship within the overall car length limitation of about 97 feet and the 60 foot distance between the trucks, the single length container section requires that the draft sill 16 be of greater length than the draft sill 15 to accommodate the length of the single level container C. It should be readily apparent that the draft sill 15 is held at a minimum length as dictated by well established railway car principles because this end of the car is not utilized to support any of the containers.

What is claimed is:

1. A railway car for transporting a plurality of loaded van type cargo carrying containers adapted for stacking solely in corner to corner relationship and having a total length in excess of the length of said car and a total gross weight substantially equal to the load carrying capacity of said car, said containers being disposed in end-to-end relationship along the length of said car in dual stacked position in the general area containing the center of gravity of said car and in a single level adjacent one end of said car, said ratio of the gross weight of said dual stacked containers to said single level containers being at least 2:1, said car comprising an underframe having a container supporting surface for supporting said single level containers from one end thereof and a dual stacked container supporting surface adjacent said single level of containers, a pair of lengthwise spaced trucks supporting said underframe, one of said trucks being located in close proximity to the outboard end of said stacked containers and the other of said trucks underlying said single level containers and being spaced from said one truck so that the center of gravity of said car and the resultant center of gravity of said dual and said single level containers lies approximately midway between the center line of said trucks.

2. The invention as defined in claim 1 wherein said underframe includes a first bolster at one end of said car supporting one of said trucks, a first draft sill extending outboard of said first bolster, a second bolster spaced lengthwise from said first bolster, a second draft sill extending outboard of said second bolster toward the other end of said car and wherein said dual stacked container is located at one end inboard of said bolster and the other end adjacent to said single level container surface, and said single level container support surface extends over said second draft sill.

3. The invention as defined in claim 2 wherein said stacked container support surface is disposed at a level below said draft sills and wherein said single level container support surface is substantially on the same plane as the top of said second bolster.

4. The invention as defined in claim 3 wherein said second draft sill is of greater length than said first draft sill.

5. A railway car for transporting a plurality of loaded van type cargo carrying containers adapted for stacking solely in corner to corner relationship and having a total

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length in excess of the length of said car and a total gross weight substantially equal to the load carrying capacity of said car, said containers being disposed in end-to-end relationship along the length of said car in dual stacked position in the general area containing the center of gravity of said car and in a single level adjacent one end of said car, said ratio of the gross weight of said dual stacked containers to said single level containers being at least 2:1, said car comprising an underframe having a container supporting surface for supporting said single level containers from one end thereof and dual stacked container supporting surface adjacent said single level containers, said dual stacked container supporting surface being located at a level below said single level container supporting surface and below the coupler line of draft, a pair of lengthwise spaced trucks supporting said under-

frame, one of said trucks being located in close proximity to the outboard end of said stacked containers and the other of said trucks underlying said single containers and being spaced from said one truck so that the center of gravity of said car and the resultant center of gravity of said dual and said single containers lies approximately midway between the center line of said trucks.

References Cited

UNITED STATES PATENTS

2,996,020	8/1961	Udstad	105—367
3,319,583	5/1967	Gutridge	105—366
3,339,501	9/1967	Gutridge	105—366 X

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