Nov. 22, 1938. C. E. TUTTLE 2,137,255

MERCHANDISE CONTAINER

Filed Aug. 7, 1935

Fig. 1.

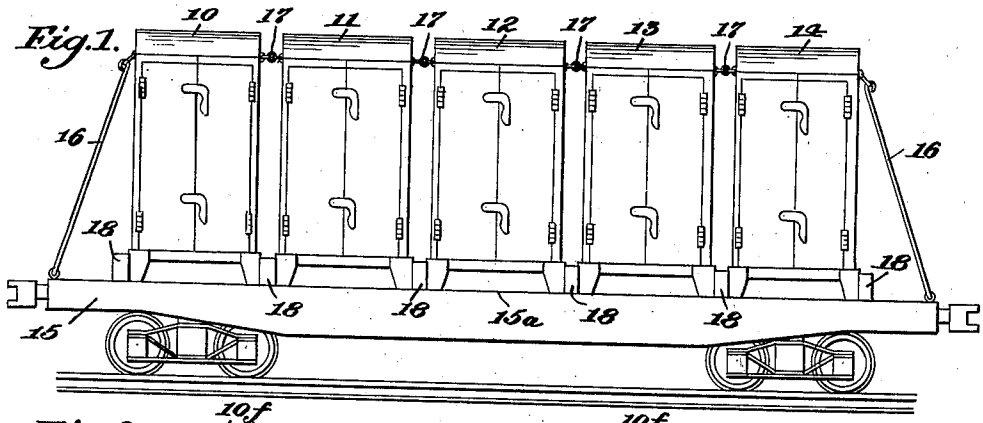


Fig. 2.

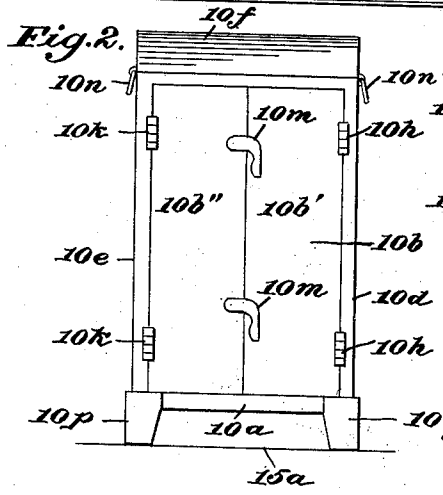


Fig. 4.

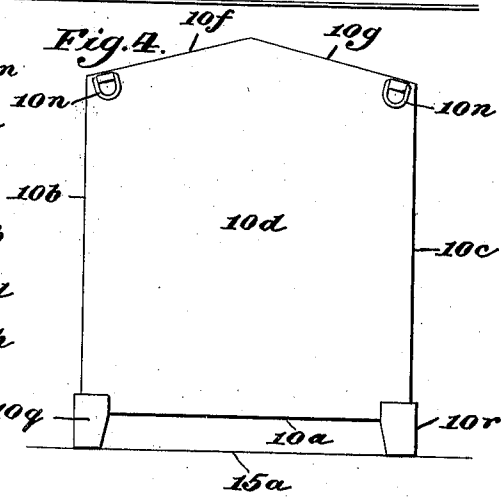
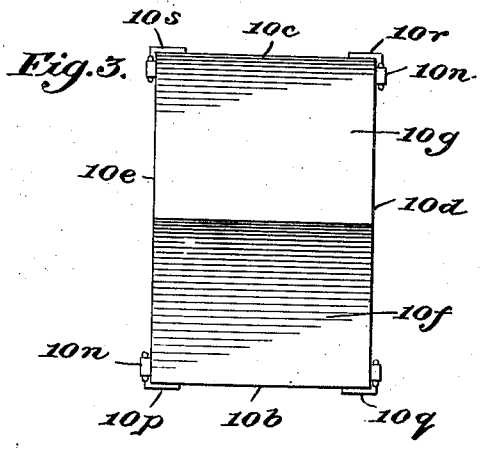


Fig. 3.



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2,137,255

MERCHANDISE CONTAINER

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7 Claims. (Cl. 220—1.5)

This invention relates to railway equipment and more especially to shipping containers for merchandise in less than car load lots.

Among the objects of my invention is the provision of merchandise containers which are simple, trim and comparatively inexpensive in construction; which are light in weight yet which are strong, rugged and durable, and which are peculiarly adapted to withstand the variety of conditions encountered in actual practical use, with a minimum of attention, replacement and repair, where rain, snow, sleet, the salty atmosphere of the seaboard and sulphurous atmosphere of industrial centers are met with under conditions of shock, vibration and other stresses of hauling and transfer.

The invention accordingly consists in the combination of elements, features of construction and arrangement of parts as described herein, the scope of the application of which is indicated in the following claims.

In the accompanying drawing illustrating certain features of my invention, Figure 1 is a front elevation of a number of merchandise containers mounted on a railway flat car and ready for transportation,

Figure 2 is a front elevation, on an enlarged scale, of one of the containers shown in Figure 1, and

Figures 3 and 4 are respectively plan and end end elevation views of the container shown in Figure 2.

Like reference characters denote like parts throughout the several views of the drawing.

As conducive to a clearer understanding of certain features of my invention it may be noted at this point that in agricultural and industrial commerce great quantities of merchandise are transported on behalf of the comparatively small shipper. Heretofore this merchandise has been crated, checked and loaded into railway freight cars for transportation. The making up of a car load causes delay. More time is lost in unloading the car and checking the load after some point near the destination of the goods is reached. As a result much of the small business is being handled by trucks giving door to door delivery service.

An increasing amount of the merchandise transported in commerce is being handled by shipping containers. These containers are ordinarily something less than a railway freight car in width, are in length about equal to the width and in height are about the same as a freight car. About five or six containers stacked end-to-end are conveniently transported on a single railway flat-car or in a gondola car as desired.

In the transportation and handling of agricultural and industrial produce by means of merchandise containers, one or more containers is delivered to a customer. The containers are loaded with the merchandise to be transported and locked and billed for the desired destination. Loaded containers are taken to the railway loading depot, by motor trucks for example, and placed upon a suitable railway car, such as a flat car or gondola, designated for a depot near the point of destination.

A loaded car arriving at a station near the destination is side-tracked and the containers are removed by crane or skids and placed upon motor trucks for delivery to the door of the consignee. The delivered containers are unlocked and unloaded by the consignee at his convenience. Empty containers are either used by the consignee in the transportation of his produce or they are returned to the depot for conveyance to a nearby customer for loading.

Heretofore known and/or used containers of the character indicated are ordinarily fashioned of iron or steel because of the availability and utility of the metal. The containers are built up of iron or steel sheet or plate, either plane or corrugated as desired, secured together in proper relationship by bolting, riveting or welding. The finished container is strong, rugged and fully calculated to resist the exacting conditions met on the road.

In use the containers encounter a variety of weather conditions tending to foster corrosion and ultimate dissolution of the metal. Rain, sleet and ice are met with. The highly corrosive salt atmosphere of the seaboard and the sulphurous atmosphere of industrial centers are encountered. Grit and soot commonly met, are corrosion-fostering agents. Furthermore, in many instances, material or produce transported in the container, such as fruits, vegetables, ores of non-ferrous metals, lime, coal, etc. either directly affect the material of the container or in combination with the moisture present in the atmosphere are inclined to effect a persistent corrosion of the container.

In addition, the various stresses of impact, vibration and body weaving are encountered, all under a variety of temperature conditions ranging from noon-day summer heat to sub-zero winter cold, in the loading, unloading, truck hauling and railway transportation of the containers.

Under the constant attack of the atmosphere, especially where salty and/or sulphurous conditions are encountered, the various parts of the containers tend to rust or corrode. Corrosion products tend to form on the exposed surfaces of the container and rapidly progress. This tendency is particularly pronounced where, under the various stresses of shock, vibration and body weaving encountered as above indicated large sections of corrosion product are inclined to slough off exposing underlying metal which further corrodes. Loss of the material comprising the walls, roof, and framework of a container directly weakens the container and sharply curtails its expected useful life.

In heretofore known and/or used merchandise containers for less than car lots, an attempt is made to prevent the corrosion and consequent loss of material of the container walls, roof, frame, etc. by either fashioning these various parts of metal plated with cadmium, zinc or tin or coating the container with any one of a number of well known oxide paints. Under the many varying conditions met with in actual practical use, however, the protective plating or coating of paint soon cracks or becomes scratched or is otherwise broken exposing the underlying metal. A direct attack of the atmosphere is thus permitted with the consequent corrosion of the metal and weakening of the parts of the container, all as more particularly described above. The periodical cleaning and plating or coating of such containers in an attempt to preserve them and prolong their useful lives is costly in that materials, time and labor are consumed and furthermore is wholly unreliable as briefly indicated above.

Now in order to compensate for the loss of material of the walls, roof, floor and frame of a container through the corrosive attack of the atmosphere and also through the attack of fumes, vapors or substance of materials transported in the container, these various parts are fashioned of iron or steel sheet or plate which is some twenty-five per cent to fifty per cent thicker than normally required. This expedient, of course, directly results in a heavy cumbersome container and the imposition of a direct reduction in the permissible load carried by the container. The cost of moving, hauling, transporting and otherwise handling the container is undesirably high both for the loaded and unloaded condition.

One of the outstanding objects of my invention is the provision of a strong, rugged, lightweight and thoroughly practical merchandise container for less than car load lots which without benefit of plating, painting or otherwise coating the surface, is resistant to the corrosive attack of atmosphere and produce transported in the container, which is of minimum tare and capable of transporting loads of greater weight than heretofore known containers of the character indicated, permitting increased revenue load hauls with decreased handling charges per unit of weight of merchandise transported, and which is well adapted to withstand the varying conditions of actual practical use giving a long useful life with minimum loss of service for layover and repair.

Referring now more particularly to the practice of my invention attention is directed to Fig. 1 of the drawing where a plurality of merchandise containers for less than car load lots, illustratively five, indicated at **10**, **11**, **12**, **13**, and **14**, are mounted in any suitable manner on a railway flat car, generally indicated at **15**. Conveniently, the merchandise containers are secured on the flat car by means of guy wires **16** running from the tops of the extreme containers to the near ends of the car (short links **17** interconnect the tops of adjoining containers) and by blocks **18** fastened to the floor of the car abutting the bases of the various containers. In this manner some slight relative motion between the containers is permitted in response to the weave of the car in motion and the strains incident to this motion are substantially relieved.

My merchandise containers (see Figs. 2, 3 and 4) illustratively comprise a rectangular floor or base portion **10***a*, opposed side-wall portions **10***b* and **10***c* rising therefrom, opposed end-wall portions **10***d* and **10***e* rising from the base and secured to the side-wall portions, and a sloping roof **10***f*—*g* secured to the top of the side and end-wall portions and completing the enclosure. These various floor, wall and roof portions are preferably braced by a suitable frame (not shown). Conveniently, the opposed side-wall portions **10***b* and **10***c* consist of double doors permitting free access to the interior of the container. For example, see Fig. 2, the side-wall **10***b* comprise double doors **10***b'* and **10***b''* conveniently hinged adjacent the end-wall portions **10***d* and **10***e*, respectively, as at **10***h* and **10***k*. Double doors **10***b'* and **10***b''* are secured in a closed position and locked by means of fastening devices generally indicated at **10***m*.

Suitable rings or bails **10***n* secured to the opposite edges of the upper parts of end-wall portions **10***d* and **10***e* provide means for lifting the container by crane or hoist. Provision is also made to handle the container by means of skids by providing the container with short legs **10***p*, **10***q*, **10***r*, and **10***s*, thereby spacing the container floor **10***a* a suitable distance above the floor **15***a* of the flat car or other floor upon which the container rests.

In order that the various parts of the container body and frame may be resistant to the corrosive attack of the atmosphere under the various conditions of heat and cold, wet and dry weather, all in the presence of acid, alkaline, or salt, vapor or moisture contained in the atmosphere, and further in order that the body and frame of the container may be sufficiently strong to withstand the various stresses encountered in actual practical use with minimum fatigue and failure, and yet be of relatively light weight and of minimum tare, the various parts of the container including walls, roof, and frame are fashioned of incorrodible iron sheet, plate, bar and rod stock analyzing approximately 6% to 17% chromium, .02% to .15% carbon, and the balance substantially iron (preferably analyzing 11% to 13% chromium, .03% to .08% carbon, and the balance iron) cut, drilled, pressed, bent, and otherwise shaped or formed to desired size and configuration.

These various individual parts are riveted or welded together as desired, giving a container of strong, rugged, and durable construction. In the fabrication of the container by welding methods either electric arc welding equipment or oxy-acetylene equipment may be employed, although for most purposes the former is preferred. In both instances, welding rods of approximately the same analysis as the metal welded are employed although austenitic chromium-nickel steel welding rods give good results.

The body and frame of the container are pecu-

liarly resistant to rusting or the formation of a corrosion product under the attack of atmosphere and the various corrosion or corrosion-fostering materials transported in the container, all without benefit of special hardening of the metal by heat-treatment and without the necessity of polishing, buffing or other special preparation of metal surface.

As a result of the incorrodible nature of my improved merchandise containers, a direct reduction in weight over heretofore known containers of the character indicated is realized where additional thickness of metal is provided in anticipation of the loss by corrosion and abrasion under the conditions encountered in actual practical use. The reduction in the thickness of the various walls, doors, roof, floor, frame and the like, amounts to about 20% or 30% of the thickness of iron or steel, sheet, plate, bars, and rods employed in standard container design.

By virtue of the increased strength, toughness, and durability of incorrodible iron of the analysis indicated over the iron and steel commonly employed in the construction of containers, a further reduction is permitted in the thickness of the various parts of the container giving thereby a further decrease in weight. This further reduction in the weight of the container amounts to some 20% giving a total reduction in weight then of about 40% to 50%. For example, a standard container of about 400 cu. ft. capacity designed to handle a 9,000 pound load, weighs approximately 2,500 pounds, while a similar container constructed in accordance with the provisions of my invention weighs approximately 1,300 pounds. The substantial reduction in tare affords a direct saving in the handling and transportation of the container in both the loaded and empty condition. By reducing the dead weight of the container itself, the revenue load may be proportionately increased, as by increasing the load of the container, where the weight rather than volume is the limiting factor, or by increasing the total number of containers mounted upon flat cars included in a train load.

In general the highly beneficial results achieved with my container, such as the strength, corrosion-resistance and durability, under the many varying conditions encountered in actual practical use are in a great measure due to the presence of chromium in the iron sheet, plate, bars and rods forming the various parts of the container. The ingredient carbon is present largely as an unavoidable impurity although carbon in the amount indicated is not particularly objectionable and in fact lends a certain desired hardness to the metal.

The corrosion resistance, strength and general durability of my container are improved somewhat by including in the analysis of the metal of the body and frame of the container the ingredient molybdenum in the amount of about .1% to 1%. Ordinarily, the amount of molybdenum employed amounts to about .5% since this ingredient is comparatively expensive. Molybdenum lends a certain soundness and timbre to the metal and in addition lends a certain ease in the shaping and forming of the metal, assuring a smooth regular surface at the bent regions. Furthermore, this ingredient is especially effective in rendering the container resistant to a peculiar type of local corrosion commonly known as pitting. Molybdenum in the amount indicated fully assures the incorrodible character of the container without necessity for hardening by heat-treatment, polishing or other special preparation of a desired surface.

Where a container is fabricated by welding operations the incorrodible iron plate, sheet, bars, rods and special shapes employed preferably include in their analyses about .3% to 4% nickel, the various parts of the container fashioned of metal analyzing then, 6% to 17% chromium, .3% to 4% nickel, .02% to .15% carbon and the balance iron. These parts are so sluggish under the heating encountered in the welding operation that no essential softening or hardening of the metal results during this heating or in the subsequent cooling to normal temperatures. In fact, advantage may be taken of the structural sluggishness of metal of this analysis to locally heat the areas adjacent the welded sections in order to relieve the stresses set up as a result of the welding operation. In addition, my improved container fashioned of plate, sheet, bars, special shapes and rods of this analysis is particularly strong, tough, and durable, and well adapted to withstand the shock, corrosive attack and abrasion encountered in use.

Certain further advantages are gained in the fabrication of my container and in the use of the same, especially in the fabrication and use of a welded container, where the ingredient manganese in the amount of about .3% to 3% is included in the analysis of the incorrodible iron. The presence of manganese in the metal renders the weld more fluid, generally improving the physical appearance of the welded area and reducing the number of pockets, pits, projections or similar interruptions to the even surfaces of the walls, doors, roof and other parts of the container where corrosion-fostering material may lodge. Manganese, furthermore, lends to the various parts of my container a certain structural sluggishness, toughness, resistance to fatigue and resistance to corrosion in many ways similar to the characteristics imparted by the presence of nickel in the material. While good results are achieved by including either manganese or nickel in the analysis of the material, best results are achieved by including both of these ingredients in the amounts indicated and especially where the sum of the manganese and nickel contents amounts to about 1% to 5%.

Certain further advantages are obtained by including in the analysis of the material the ingredient copper in the amount of about .3% to 3%. Copper acts much the same as nickel in rendering the metal structurally sluggish. Frequently, it is desirable to partially replace the nickel content by copper because of the comparative cheapness of this alloying ingredient.

Certain further advantages are gained by including the ingredient silicon in the amount of about .4% to 2% in the analysis of the metal. Silicon gives strength to the metal and furthermore facilitates the welding of the metal, in the fabrication of the container, in lending a certain fluidity to the weld. In this respect the silicon present acts much the same as manganese.

Thus it will be seen that there has been provided in this invention a merchandise container in which the various objects hereinbefore noted together with many thoroughly practical advantages are successfully achieved. It will be seen that the container is strong, rugged and durable in construction, that it is substantially completely resistant to the corrosive attack of the atmosphere and materials ordinarily handled in such containers, and furthermore, that it is

lighter in weight than heretofore known containers of the class indicated permitting great savings in the transportation and handling of merchandise in less than car load lots.

While, as more particularly indicated above, certain special benefits are achieved with my container by including in the analysis of the metal the ingredients, molybdenum, nickel, manganese, copper, and silicon, especially in a container of the welded construction, it will be understood that certain advantages are realized by including two or more of these ingredients in various combinations as desired. It will be further understood that certain of these advantages are also realized by including one or more of these ingredients in the amounts indicated in a container of the riveted type of construction.

As many possible embodiments may be made of my invention and as many changes may be made in the embodiments hereinbefore set forth, it will be understood that all matter described herein or shown in the accompanying drawing is to be interpreted as illustrative, and not in a limiting sense.

I claim:

1. In railway equipment of the class described, a merchandise container for less than car load lots comprising a body portion adapted to withstand wear and corrosive attack under the shock and vibration encountered in use, said body portion being fashioned of incorrodible iron plate or sheet analyzing approximately, 6 per cent to 17 per cent chromium, .3 per cent to 3 per cent manganese, .02 per cent to .15 per cent carbon, and the balance substantially iron.

2. In railway equipment of the class described, a merchandise container for less than car load lots comprising a body portion adapted to withstand wear and corrosive attack under the shock and vibration encountered in use, said body portion being fashioned of incorrodible iron plate or sheet analyzing approximately, 6 per cent to 17 per cent chromium, .3 per cent to 3 per cent manganese, .1 per cent to 1 per cent molybdenum, .03 per cent to .08 per cent carbon, and the balance substantially iron.

3. In railway equipment of the class described, a merchandise container for less than car load lots comprising a body portion adapted to withstand wear and corrosive attack under the shock and vibration encountered in use, said body portion being fashioned of alloy iron analyzing approximately, 11 per cent to 13 per cent chromium, .3 per cent to 4 per cent nickel, .1 per cent to 1 per cent molybdenum, .3 per cent to 3 per cent manganese, .03 per cent to .08 per cent carbon, and the balance substantially iron.

4. In railway equipment of the class described, a merchandise container for less than car load lots comprising a welded body portion adapted to withstand wear and corrosive attack under the shock and vibration encountered in use, said body portion being fashioned of alloy iron analyzing approximately, 11 per cent to 13 per cent chromium, .1 per cent to 1 per cent molybdenum, .3 per cent to 3 per cent manganese, .03 per cent to .08 per cent carbon, and the balance substantially iron.

5. In railway equipment of the class described, a merchandise container for less than car load lots comprising a welded body portion adapted to withstand wear and corrosive attack under the shock and vibration encountered in use, said body portion being fashioned of alloy iron analyzing approximately, 11 per cent to 13 per cent chromium, .3 per cent to 4 per cent nickel, .3 per cent to 3 per cent manganese, .03 per cent to .08 per cent carbon, and the balance substantially iron.

6. In railway equipment of the class described, a merchandise container for less than car load lots, comprising a body portion adapted to withstand wear and corrosive attack under the shock and vibration encountered in use, said body portion being fashioned of alloy iron analyzing approximately, 6 per cent to 17 per cent chromium, .02 per cent to .15 per cent carbon and the balance substantially iron.

7. In railway equipment of the class described, a merchandise container for less than car load lots, comprising a body portion adapted to withstand wear and corrosive attack under the shock and vibration encountered in use, said body portion being fashioned of alloy iron analyzing approximately, 11 per cent to 13 per cent chromium, .03 per cent to .08 per cent carbon and the balance substantially iron.

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