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A. H. SMITH

TRANSPORTATION CAR AND CONTAINER

Filed Dec. 22, 1925

3 Sheets-Sheet 1

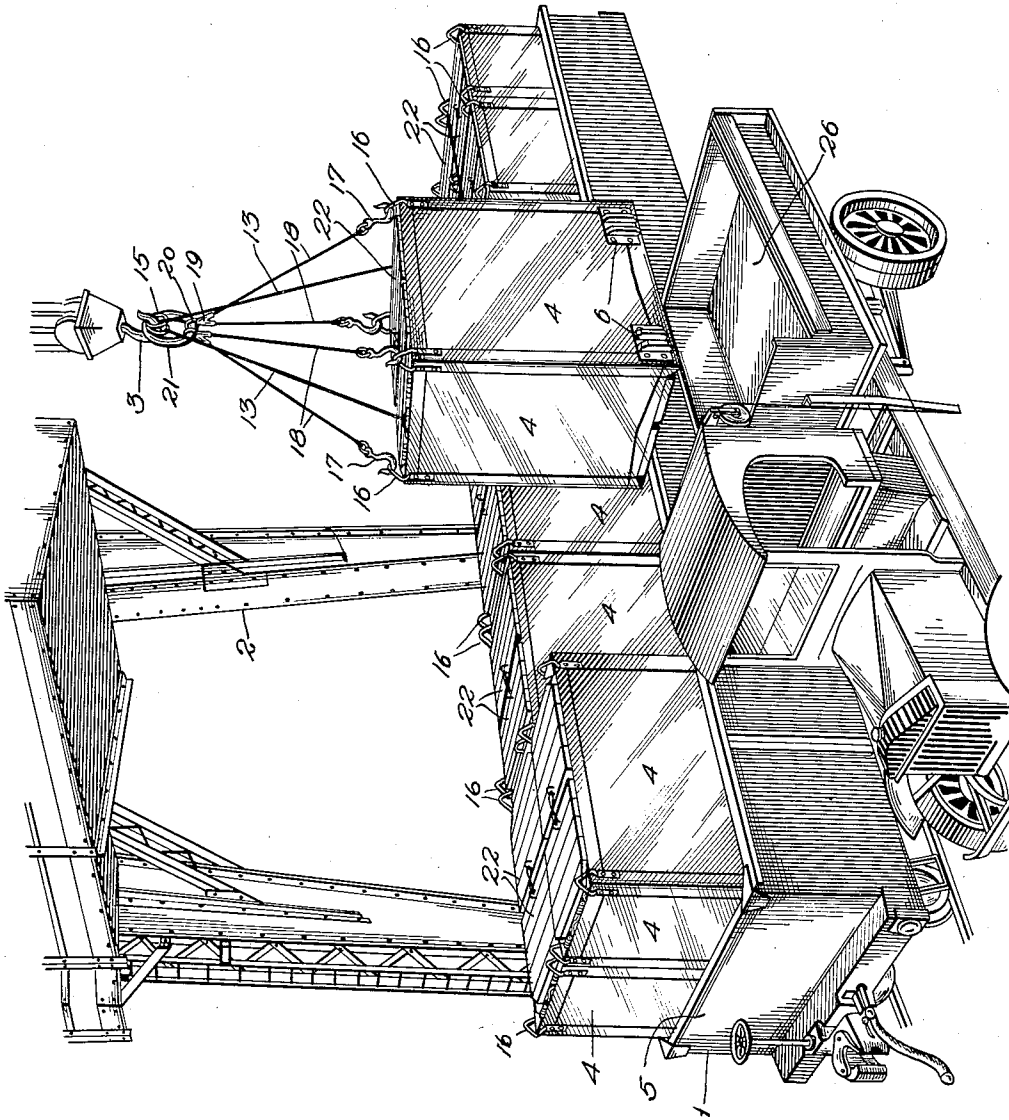


Fig. 1.

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Fig. 2.

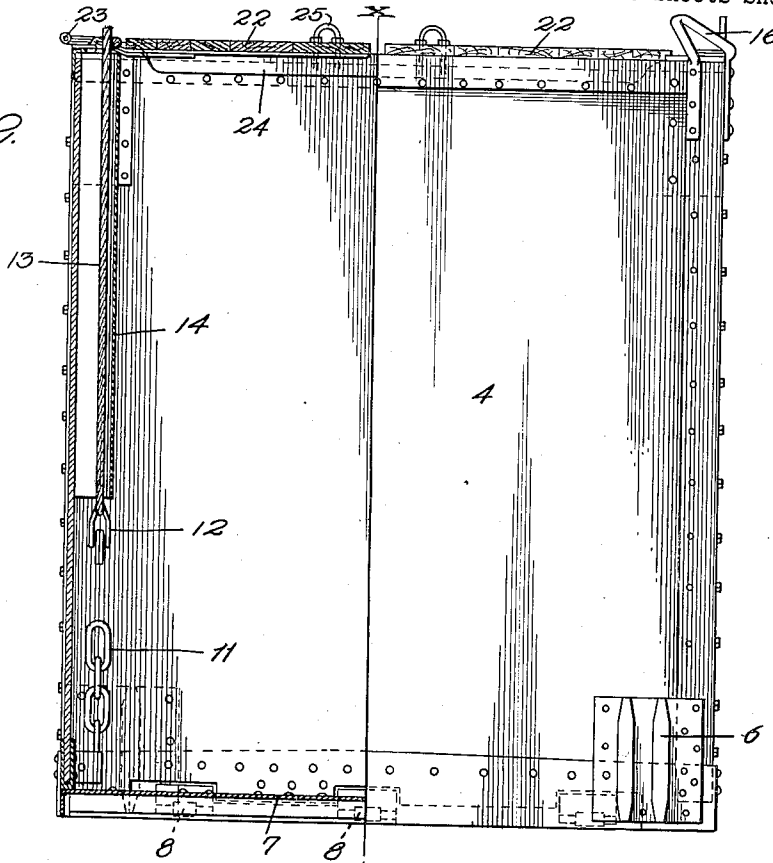
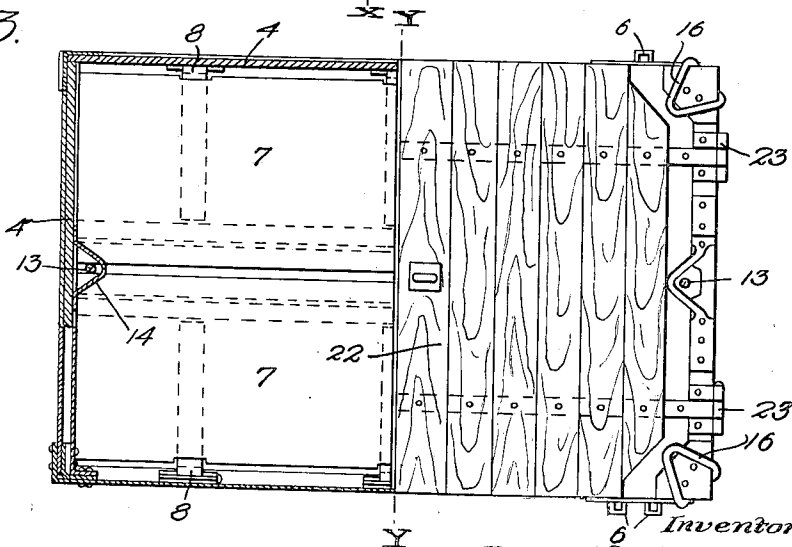


Fig. 3.



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Fig. 4.

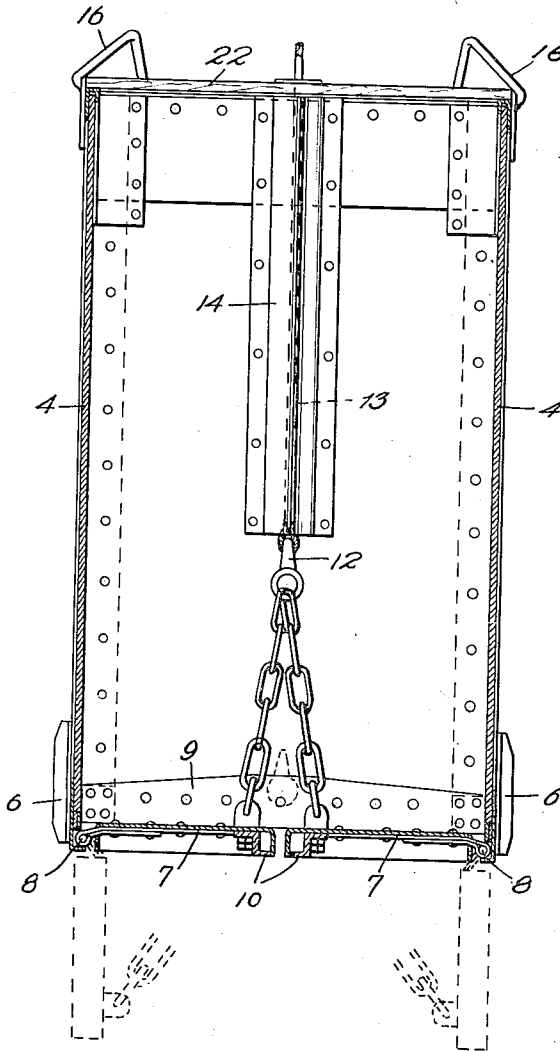
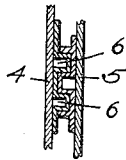


Fig. 5.



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UNITED STATES PATENT OFFICE.

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TRANSPORTATION CAR AND CONTAINER.

Application filed December 22, 1925. Serial No. 77,055.

This invention relates generally to goods transportation systems and apparatus, and particularly to transportation means of that type in which a railway car, or other transportation vehicle, is designed for the reception of container units intended to hold the goods to be shipped, in contradistinction to the direct loading of the goods in or upon the car per se, and in which the car and container units are of such conformation and relative dimensions that a certain number of units may be systematically arranged or placed in specified relation within or upon a car of a given size, such units, each with its contained proportion of the aggregate load, being capable of being independently transferred to and from the car, for car loading and unloading actions, by means of a crane or other hoisting mechanism.

The primary object of the present invention is to provide container units of such construction, for use in conjunction with a crane or other hoisting means, as to facilitate the placement of the units upon or their displacement from the car or other transportation vehicle, the transfer of such units from one transportation vehicle to another, the raising and lowering of the units between floors or other surfaces or between such surfaces and transportation vehicles, and the discharge from the units of their contents, all in such manner as to reduce the number of handling operations and save time and labor.

Another object of the invention is to provide a container unit having bottom drop doors for supporting and dropping the load, together with means whereby the container unit and its drop doors may be engaged with and supported from a crane, so that the doors may be held closed and the load prevented from discharging while the unit is being shifted by the crane, said engaging and supporting means being adapted to permit of the release of the doors while the unit is still engaged by the crane, whereby through proper movement of the unit under the action of the crane the drop doors may be opened up and the load discharged.

Still another object of the invention is to provide a construction whereby the crane engaging and supporting means for the doors will be securely shielded and protected from liability of casual damage by contact with extraneous objects while the units are in course of transit or being handled by the crane.

Still another object of the invention is to provide doors or lids for closing the tops of the containers against the entrance of rain, snow, etc., when exposed in an open-topped car such as a railway car of gondola type, which doors are adapted to open within the boundary line of the car body so as to avoid their projection beyond the walls of the car body and damage to them or to other objects during the movements of the cars.

Still another object of the invention is to provide a novel combinative arrangement and organization of parts whereby displacement of units from their established positions in a car due to car movements after one or more associated units have been removed will be prevented, and whereby coordinated coaction between the units, transportation vehicle and a crane may be obtained in the carrying out of loading, unloading and hoisting actions with a minimum of handling and with a material saving of time and labor.

With these and other objects in view, the invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a perspective view showing a railway car partly loaded with the improved containers and illustrating the operation of shifting a container from the car to an automobile truck, or vice versa, or disposing a container in position for its contents to be dumped into the truck.

Figure 2 is a view looking toward one side of a container, the container appearing in side elevation and in central longitudinal section, respectively, on opposite sides of the center indicating line $x-x$.

Figure 3 is a view of the container showing one-half of the container in top plan with its companion top door or lid section closed, and showing the other half of the container in horizontal section.

Figure 4 is a vertical transverse section on

line $y-y$ of Figure 3, showing respectively in full and broken lines the bottom drop doors open and closed.

Figure 5 is a detail horizontal section through a portion of a car and a container.

Referring now more particularly to the drawings, 1 designates a railway car or other transportation vehicle, 2 a crane or other similar hoisting device, of which 3 is the grab hook, and 4 goods containers, employed in a transportation system embodying the invention. The car 1 shown is of gondola type, having a shallow open top body 5, within which the receptacles 4 are designed to be placed. A crane 2, or its equivalent, is located at each shipping or loading point and at each destination or unloading point, for raising and lowering the containers 4 into and out of the car body 5 and performing other operations, as hereinafter fully described.

Each container 4 is of a height greater than the depth of the shallow body 5, so that it may be made of fairly large holding capacity, while at the same time the comparatively shallow depth of the body will permit the containers to be raised and lowered therein and swung over the sides thereof with a minimum degree of raising and lowering travel and with great ease and facility. The body 5 and containers 4 are further of such relative dimensions that a given number of systematically arranged containers may be disposed within the body to load the same to full capacity. The containers are similar in construction and dimensions to each other and are adapted to be interchangeably received each within a given space in the car body.

Each container, as shown, consists of a hollow goods containing body of rectangular or oblong rectangular form. In the present instance, the containers are shown as of oblong rectangular form, and of such dimensions, relatively to each other and to the car body 5, as to be disposed in said body 5 in parallel longitudinal and transverse rows. In the present instance the containers are arranged in two longitudinal rows, of six containers to each row, extending the full length of the body 5, and of a corresponding number of transverse rows, of a pair of containers to each row, extending the full width of the body, but the number and arrangement of the containers intended to be received in any particular car body may be varied, and the dimensions also varied, as circumstances may require in the transportation of the same or different kinds of goods, as will be readily understood. In all cases, however, at least one side of a container faces an adjacent side of the body 5, and upon such opposed sides of the container and body are preferably provided ribbed guide shoes 6 adapted for sliding engage-

ment with each other in the operations of inserting and removing the container. These interengaging guide shoes serve as gaging means for accurately indicating the position to be occupied by each container, and in guiding it into such position. They also serve as a means for holding each container in position against displacement from its predetermined position under shifting movements of the car body when the car is in transit, in the event of there being vacant spaces in the car body due to the prior removal of one or more other and adjacent containers.

Each container 4 may be made of steel or other suitable strong and durable material, reinforced, if desired, in any preferred manner. As shown, each container body is normally open at bottom and top. Doors 7 are provided for closing the bottom of the body and retaining the goods to be shipped therein. These doors, of which a pair are employed, are hinged at their outer edges, as indicated at 8, to the sides of the body and are adapted when in closed position to abut against jamb sills 9 secured to the ends of the body, whereby undue inward movement of the doors is prevented. The doors when in closed position lie wholly within and above the horizontal plane of the lower edges of the walls of the body. Provided upon the free or swinging edges of the doors are stiles 10 jutting outwardly therefrom, and which, when the doors are closed, lie in the plane of the lower edges of the walls of the body and form therewith supplemental supports to stably hold the body in an erect position. The stiles 10 further serve as abutments for contact with the ground, a floor surface, or other surface, in order to prevent injury to the doors in a dumping operation, as hereinafter described. Secured to the free edges of the doors at each end of the container is a flexible draft element consisting of chain sections 11 fastened at their lower ends to the doors and connected at their upper ends by a coupling 12 to a draft cable 13, the draft cables of the respective draft devices extending upwardly through and being slidably mounted in channeled guides and guards 14 and being provided at their upper ends with engaging rings or links 15 for connection with the grab hook 3 of the crane 2. The channeled guides and guards 14 terminate at their upper ends flush with the upper edges of the container walls and extend downwardly within the container to a determined degree, such guards serving to enclose and protect the draft members 13 from abrasion or other injury by contact with the goods contained in the receptacle, as well as to prevent such contents of the receptacle from interfering with the free and easy sliding movements of the draft devices in their adjustments to

control the operation of the doors 7. The draft connections for the doors and their guards are placed upon the interior of the receptacles for the purpose of preventing damage thereto by contact with extraneous objects during the handling of the containers by the operating cranes, this arrangement also being of advantage in preventing the undue reduction of container receiving space for the reception of the containers in the car body 5, as would be the case if the parts referred to were disposed upon the exterior of the containers, and as such internal arrangement of the containers does not materially lessen the internal containing capacities of such containers.

Provided also at the top of each container are stationary engaging members 16, each shown in the present instance in the form of an eye, but which may be in the shape of a hook or of any other suitable shape desired. These engaging members 16 are placed at the corners of the container and project upwardly therefrom to a sufficient distance for engagement with hooks or like engaging members 17 on the lower ends of suspending or draft elements 18. Each of these suspending or draft elements 18 in the form shown consists of a bridle-cable composed of two cable sections provided at their lower or free ends with the hooks 17 and mutually connected at their upper ends by a coupling 19 to a link 20. The hooks 17 of one draft element 18 are designed for engagement with the eyes 16 at one end of the container and the corresponding hooks 17 of the other draft element for engagement with the eyes 16 at the opposite end of the container, while the links 20 of the two suspending elements are coupled to an engaging ring 21 adapted to be engaged with the grab hook 3 of the crane.

When a container is elevated sufficiently above the floor, ground or other supporting surface, and the draft cables 13 are free from engagement with the grab hook 3, the doors 7 are adapted to drop by gravity downwardly and outwardly to the dotted line open position shown in Figure 4, in which position the chain sections 11 spread or move in opposite directions, thus permitting of the downward passage and free discharge of the load. In such position of the doors the chains 11 and draft cables 13 are shifted downwardly to normal position, in which position the engaging links 15 lie close to or in contact with the upper ends of the guards 14. When the doors are drawn upwardly to closed position, and both the cables 13 and the container suspending or draft elements 18 are engaged with the grab hook 3 of the crane, it will be evident that the container will be supported from the crane and the doors held in closed position. The length of the cables 13 is such, relative to the length

of the suspending elements 18, that when the container is held elevated above a supporting surface by suspension from the crane, both the door controlling cables 13 and the draft suspension cable 18 will be held taut or under tension so that the doors will be held supported and closed against the weight of the load in the container. The construction is, however, such that when the container is lowered by the crane grab hook 3 to rest at its base upon a floor or other surface, the doors 7 will be held closed by contact with said surface, but by lowering the grab hook to a sufficient degree, while the container is so supported independently of the crane, the links 15 may be released from the hook 3, leaving the ring 21 engaged therewith, so that by a subsequent elevating motion of the grab hook 3 the container may be raised above the floor or other surface. When so raised, the cables being no longer connected with the grab hook, may slide freely downward under the weight of the goods upon the doors, the latter dropping and allowing the load to discharge. While the container is being elevated for this dumping operation as above described, the stiles 10 will remain in engagement with the ground or floor surface and pivot thereon as the doors open and until such stiles clamp the ground or floor surface, thus allowing the doors to gradually open in a free and easy manner and protecting them from possible damage. When, on the other hand, an empty container is being lowered by the crane down onto the floor or other surface, preliminary to a container loading operation, and the cables are free from connection with the grab hook and the doors depend in an open position, the stiles 10 will serve as preliminary contact surfaces engaging the ground or floor and pivoting thereon and causing an easy movement of the doors, without injury, to a closed position as the container descends and is finally brought to a position of rest upon the ground or other surface.

If desired, each container may be provided at its top with a pair of lid sections or doors 22 for the purpose of enabling the open top of the container to be closed and the contents thereof covered or substantially covered to protect the same from rain, snow or dust while in storage or in course of transportation. These doors or lid sections are hinged, as indicated at 23 at the opposite ends of the container and are adapted to close down flush with the upper edges of the container and rest upon jambs or sill strips 24 when in closed position. If desired the doors or lid sections may be provided adjacent to their free edges with staples 25 or the like with which fastening means of any suitable sort may be engaged to hold the doors closed, as a measure of protection against theft in the

transportation of certain classes of goods. It will be observed that these doors 22 are hinged to swing outwardly in a direction at right angles to the direction of movement of the drop door 7, and in the direction of length of the car body 5, when the container 4 is positioned thereon, so that the doors 22 of any container or the car when open will lie within the boundary space of the car body. By this means projection of said doors beyond the walls of the car body and damage to them or to other objects during the travel of the car will be prevented.

The containers may be employed for the transportation of materials and commodities of all kinds. By their use in a transportation system using the instrumentalities described, one or more handlings or transshipments may be avoided, with a consequent material saving of time and labor. Assuming, for example, that the appliances herein set forth are employed in the transportation of brick from a brick plant to a marine vessel, a brick yard, or the site of a building which is being erected, in the construction of which the brick is to be used, it is to be understood that, if these shipping and destination points are connected by rail, direct transportation of the brick from the producing kiln to the destination point may be effected without intermediate transshipments or handling. In such an operation, the containers 4 are individually loaded with the brick at the shipping point, in the instance stated at the mouth of the kiln, and then swung into position within the body 5 of the car 1. When this car arrives at the destination point, the containers 4 may one by one be lifted out of the car and swung outwardly and deposited on the ground for subsequent unloading or they may be unloaded as and when placed in their position of deposit, or they may be swung by the crane onto a platform or elevator for conveyance to an elevated point or to a position to be engaged by another crane for conveyance and discharge of the brick at a desired point for storage or use. In cases where the unloading point of the brick is at a distance from a railway station, spur or siding, the crane may be arranged and operated to lift the containers from the car 1 directly into or upon an automobile truck or other auxiliary transportation vehicle 26 arranged alongside the car 1, as shown in Figure 1, by means of which truck the container while still in unloaded condition may be carried to the exact destination point and there unloaded; or if desired the load from the container hanging suspended from the crane may be dumped into the truck 26 for final transportation. In many instances, where there are trackage connections, shipment

from a point of production directly to a point of storage or use may be effected without a single intermediate handling or transshipment of the goods, while in other cases the number of transshipments or handlings may be reduced, oftentimes to the extent of several separate transshipments or handlings, whereby transportation costs will be materially reduced.

While the structures herein shown for carrying the invention into practical effect are preferred, it is to be understood that various changes and modifications in the form, details of construction and arrangements of parts may be made, within the scope of the appended claims, without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described the invention, what is claimed is:

1. A shipping container comprising a body having a filling opening at its top and a discharge opening at its bottom, swinging drop doors for closing the discharge opening and supporting the container contents when in closed position, hinged doors for closing the filling opening at the top of the body and adapted to open in a direction at right angles to the direction of opening movement of the drop doors, means at the top of the body for engagement with flexible suspending connections whereby the body may be detachably suspended from the hook of a crane, channeled guide shields on the interior of the receptacle, and flexible supporting members attached at their lower ends to the drop doors and passing interiorly of the body upwardly through the channeled guide shields and out at the top of the body and adapted for detachable engagement at their upper ends to the hook of the crane.

2. A shipping container comprising a body of rectangular formation and having a discharge opening at its bottom, dropper doors for closing the discharge opening, said doors being hinged to two of the sides of the body, fixed engaging members at the corners of the top of the body, flexible connections engageable therewith for suspending the body from the hook of a crane, channeled guide shields on the interior of the body, and flexible members fastened at their lower ends to the free edges of the dropper doors and extending therefrom interiorly of the body upward through the guide shields and out at the top of the body, said members being adapted for detachable engagement at their upper ends with the hook of the crane.

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