To all whom it may concern:

Be it known that I, Henry W. Kirchner, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Removable and Interchangeable Units for Freight-Cars, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the removable and interchangeable units or compartments of freight cars which hold the material being transported and which are adapted to be removed bodily from the underframe of the car and conveyed to the warehouse or place where the material is to be stored or discharged, the present application being a divisional of my pending application for freight cars. Serial No. 549,865, filed March 17, 1910.

One object of my present invention is to provide a removable and interchangeable unit or compartment which is so constructed that it can be removed easily from the underframe of the car and tilted into such a position that the contents thereof will be discharged.

Other objects and desirable features of my invention will be hereinafter pointed out.

Figure 1 of the drawings is a side elevational view of a freight car provided with units constructed in accordance with my invention; Fig. 2 is a top plan view of said car; Fig. 3 is a front elevational view of the bail that is used for lifting the units bodily off the underframe; Fig. 4 is an end view of said bail; and Fig. 5 is a perspective view of one of the trunnion plates with which the units are provided.

In order that my invention may be clearly understood I have illustrated the underframe of the car on which the units are mounted, and also the means that locks the units in operative position on the underframe. My present invention relates to the construction of the units per se, however, so that I do not wish it to be understood that the units are limited to use with an underframe or locking means of the design herein shown.

Referring to the drawings which illustrate the preferred form of my invention, A designates the underframe or unit-supporting means of the car, and B designates the removable and interchangeable units or compartments which are mounted on said underframe. The units B are of uniform shape and size so that they can be interchanged or arranged in different positions on the underframe, or on the underframe of a different car of the same type, and means are provided for locking the units together and also to the underframe. Each of the units B herein shown consists of a rectangular-shaped box formed of metallic plates and commercially-rolled members, preferably angle-bars 1, which lap over the corners of the box so as to produce a strong and rigid compartment that is tight enough to hold liquids or fine granular or powdered materials.

The underframe A is provided with a plurality of unit-receiving pockets that are formed by a number of transverse members which are arranged between the units so as to prevent them from shifting longitudinally of the underframe, and a pair of longitudinally-extending members, preferably angle-bars, that extend the entire length of the underframe so as to prevent the units from moving transversely, it being understood, of course, that said members are permanently connected to the underframe. The side sills of the underframe are provided with inwardly projecting horizontal flanges, on which the units rest, said flanges being arranged in a higher horizontal plane than the center sills and cross-bearers of the underframe so that the bottom of each unit will be spaced away from said parts and thus prevent the bottom of the unit from buckling upwardly as might occur if the unit rested directly on the center sills. The underframe is also provided with transversely extending supports which are arranged parallel to the transverse members of the underframe so as to cooperate with the inwardly projecting flanges of the side sills to form an open frame on which the outer edge portion of the bottom of each unit rests.

Each unit is provided with casters or rollers of any preferred design which enable it to be moved easily after it has been
removed from the underframe, and in the construction herein shown, said casters are connected to transversely extending channels on the bottom of the unit. These channels stiffen the bottom of the unit and prevent it from buckling, and, if desired, longitudinal braces, preferably angle-bars, can be arranged between said channels, the vertical legs of said channels and angle-bars being of less depth than the legs of the channel-shaped supports so as to prevent the central portion of the bottom of the unit from bearing directly on the underframe.

The two side walls of each unit are provided with X-shaped braces which preferably consist of a pair of commercially-rolled channels 9 arranged with their legs or flanges projecting outwardly and their webs riveted to the outer faces of said side walls, as shown in Fig. 1. The two other walls of each unit are provided with hand-holds or ladders 10 which assist the trainmen to climb onto the tops of the units. It will, of course, be understood that the hand-holds on the outer walls of the two end units of the car are the only ones that are used, but I have provided both walls of each unit with hand-holes so that any of the units can be arranged at the ends of the car.

The units are locked together by means of latches 11 on one unit which cooperate with pins or projections on an adjacent unit, each unit being provided with a pair of latches 11 and a pair of pins 12 so as to enable the units to be interchanged. These latches 11 are preferably arranged adjacent the upper ends of the units, as shown in Fig. 1, near the upper ends of the X-shaped braces 9, and pivotally mounted hook-shaped devices 13 are arranged adjacent the lower ends of the unit for catching underneath cooperating hook-shaped members on the underframe so as to prevent the units from tilting or moving upwardly. Each of the devices 13 is mounted on a pin which is supported by a pair of brackets 15 which project outwardly from the side wall of the unit, and a dog, which is also mounted on said brackets, cooperates with the device 13 to lock it in its operative position, and also hold it in an inoperative position.

Each of the units is provided with a top wall which consists of a permanent portion 19 and a movable portion or door 20 that is hinged to said permanent portion, said door extending the entire width of the unit. If desired, the top wall of the unit can be provided with a filling opening that is normally closed by a cap 33, thus enabling the unit to be filled without opening the door in said top wall. The hinge which connects the door 20 to the permanent portion 19 of the top wall is protected by a head 32.

A crane or other suitable lifting apparatus is generally used for removing the units from the underframe, and I have therefore provided each unit with a pair of trunnions 28 that are adapted to be engaged by the lifting apparatus. The trunnions 28 of each unit project laterally from the side walls of the unit, as shown in Fig. 1, and they are preferably so disposed that the unit can turn automatically into a position to discharge its load while it is supported by the lifting apparatus, the lifting apparatus being provided with means for holding the unit level while it is being removed from the underframe and conveyed to the warehouse or point where the material is to be discharged. Each of the trunnions 28 is connected to a casting 26 that is secured to the side wall of the unit at a point slightly to one side of the center of said side wall so that the trunnion will be eccentrically disposed and thus cause the unit to turn or swing downwardly when the locking mechanism on the lifting apparatus is released, as hereinafter described. The trunnions 28 are provided on the inner faces 90 with grooves and recesses 27 for receiving the flanges and the webs of the X-shaped braces 9 so that said castings will lie tightly against the side walls of the units and thus produce a strong and rigid structure but it will, of course, be understood that the trunnions could be connected to the units in various other ways without departing from the spirit of my invention.

The lifting apparatus that is used for removing the units from the underframe consists of a bail or yoke which is adapted to be hooked onto a crane or other suitable over-head conveyer, not shown, said yoke comprising a cross-piece 38 that is provided with depending arms 29 which have ring-shaped bearings 30 that receive the trunnions 28 on the units. The trunnions are provided with heads 25 which are of less diameter than the inner diameter of the ring-shaped bearings 30 on the yoke so that said bearings can be slipped over the trunnions, as shown in Figs. 3 and 4, the heads 25 on the trunnions cooperating with said bearings to prevent the trunnions from slipping out of same. Each arm of the yoke or bail is provided with a locking device consisting of a reciprocating plunger 31 that is adapted to project into a notch in the trunnion or in the head thereof and thus lock the unit in a level position so that it cannot turn or swing downwardly. The plungers 31 are slidingly mounted in guideways formed in the arms 29, and means is provided for drawing said plungers out of engagement with the trunnions, the means herein shown consisting of levers 32 mounted on the arms 29 and connected by short links 33 to the upper ends of the plungers 31. The levers 32 are provided with chains 34 or other
suitable devices so as to enable them to be operated easily from the ground.

A unit of the construction above described can be used for conveying liquids or fine granular or powdered materials in view of the fact that the units are watertight and dust-proof. Consequently, such materials can be transported at a low cost as it is not necessary to store them in small packages or containers, the units being filled at the plant of the manufacturer or producer, then placed upon one of the underframes of the line or company that operates the cars, and after the car has arrived at its destination the units can be removed therefrom and conveyed to the warehouse or place where the material is to be stored or discharged. The units are so designed that they can be handled conveniently by a crane or other suitable lifting apparatus and as the units tilt automatically into a position to discharge their loads when the locking devices on the yokes are released, no manual labor is required to empty the units.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

A freight car unit or removable compartment, consisting of a rectangular-shaped sheet metal receptacle, X-shaped braces secured to the side walls of said receptacle and formed from commercially rolled angles, trunion plates secured to the side walls of said receptacle and provided on their inner faces with grooves and recesses for receiving the webs and flanges of said X-shaped braces, laterally projecting trunnions on said plates arranged eccentric with reference to the centers of said X-shaped braces, and enlarged heads on said trunnions provided with means that is adapted to cooperate with locking devices on a lifting apparatus.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this sixth day of June, 1910.

HENRY W. KIRCHNER.

Witnesses:
WELLS L. CHURCH,
GEORGE BAREWELL.