

June 28, 1932.

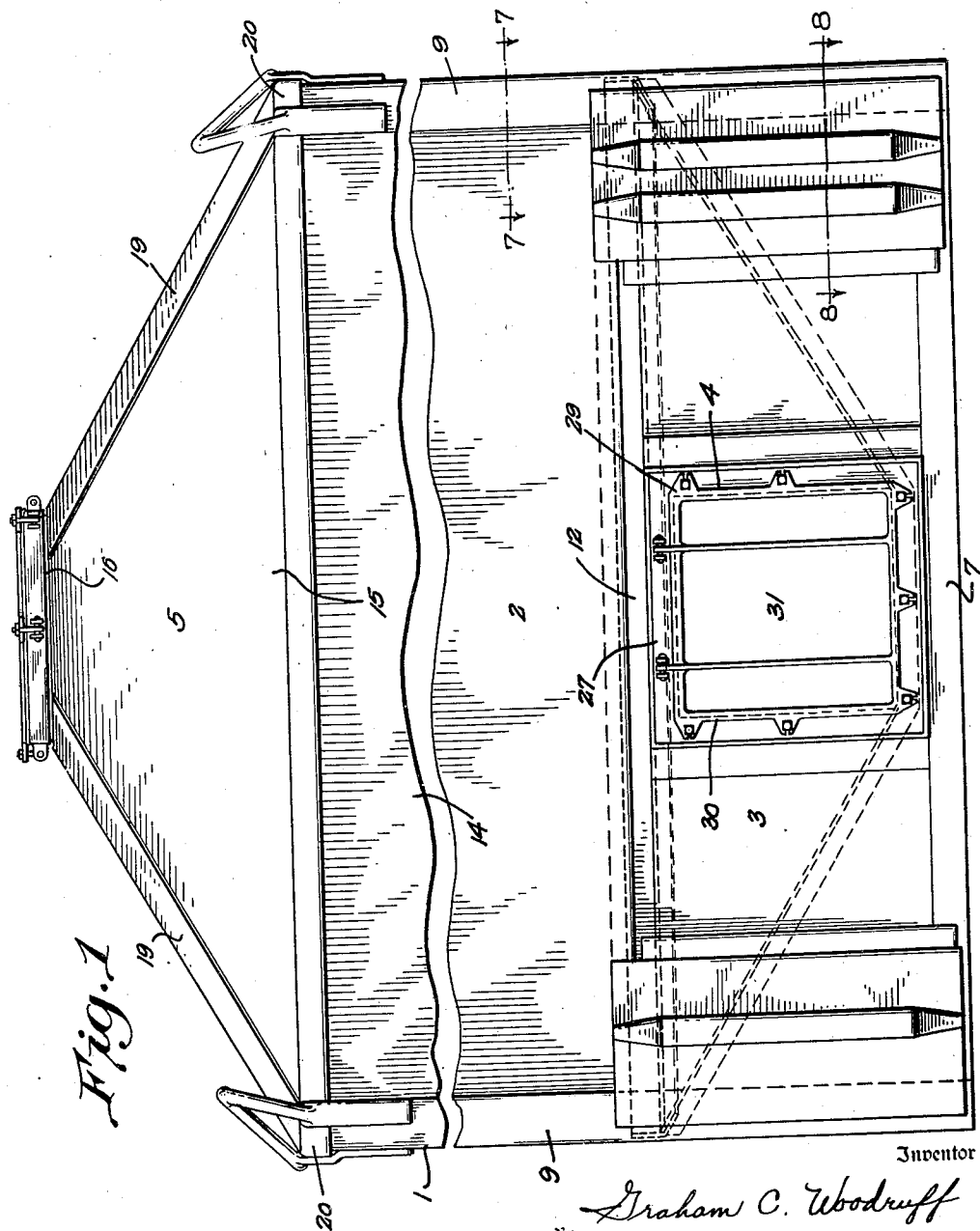
G. C. WOODRUFF

1,864,684

AIR AND MOISTURE PROOF CONTAINER FOR CONTAINER CARS

Filed Dec. 9, 1930

5 Sheets-Sheet 1



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June 28, 1932.

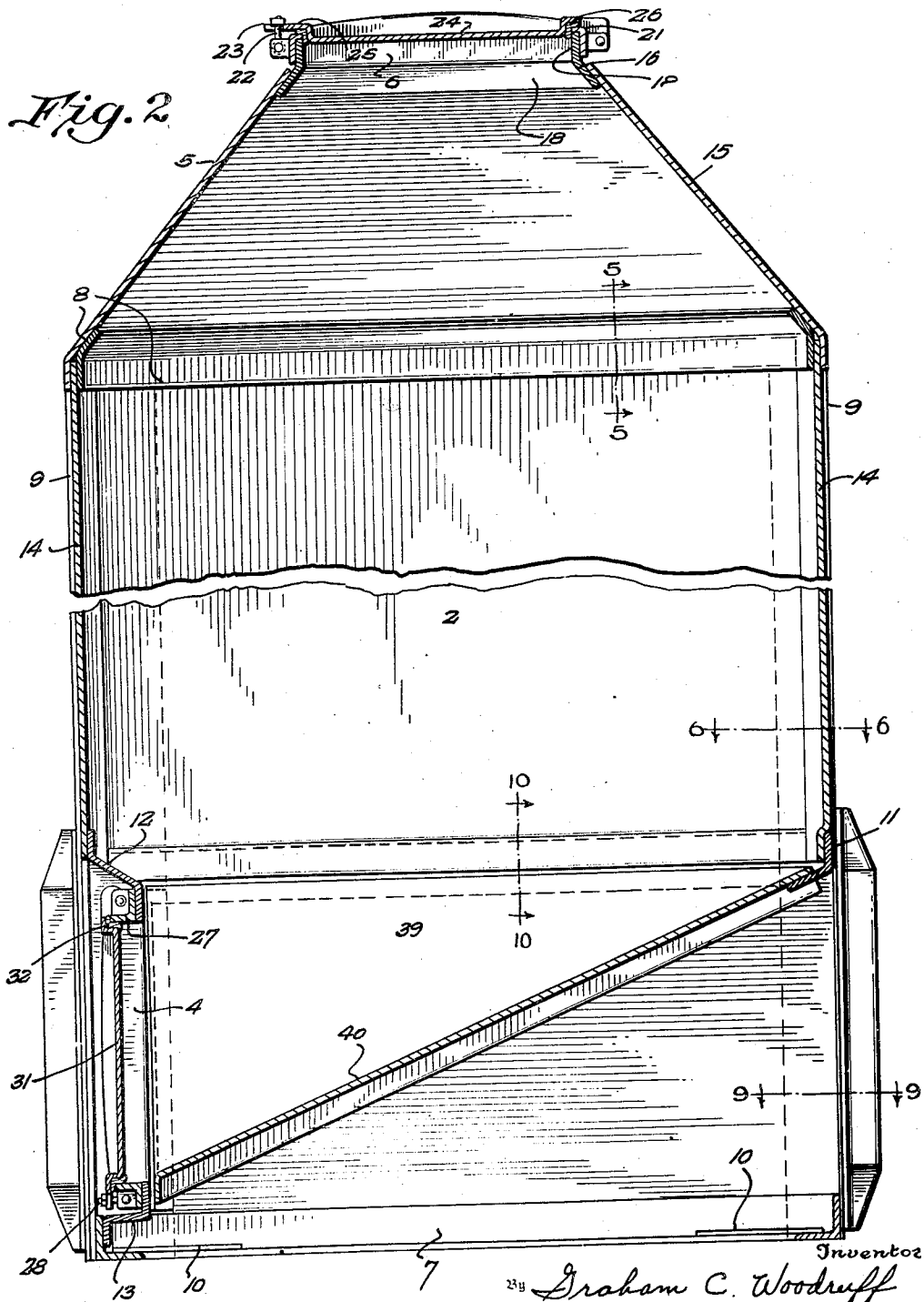
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AIR AND MOISTURE PROOF CONTAINER FOR CONTAINER CARS

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5 Sheets-Sheet 2



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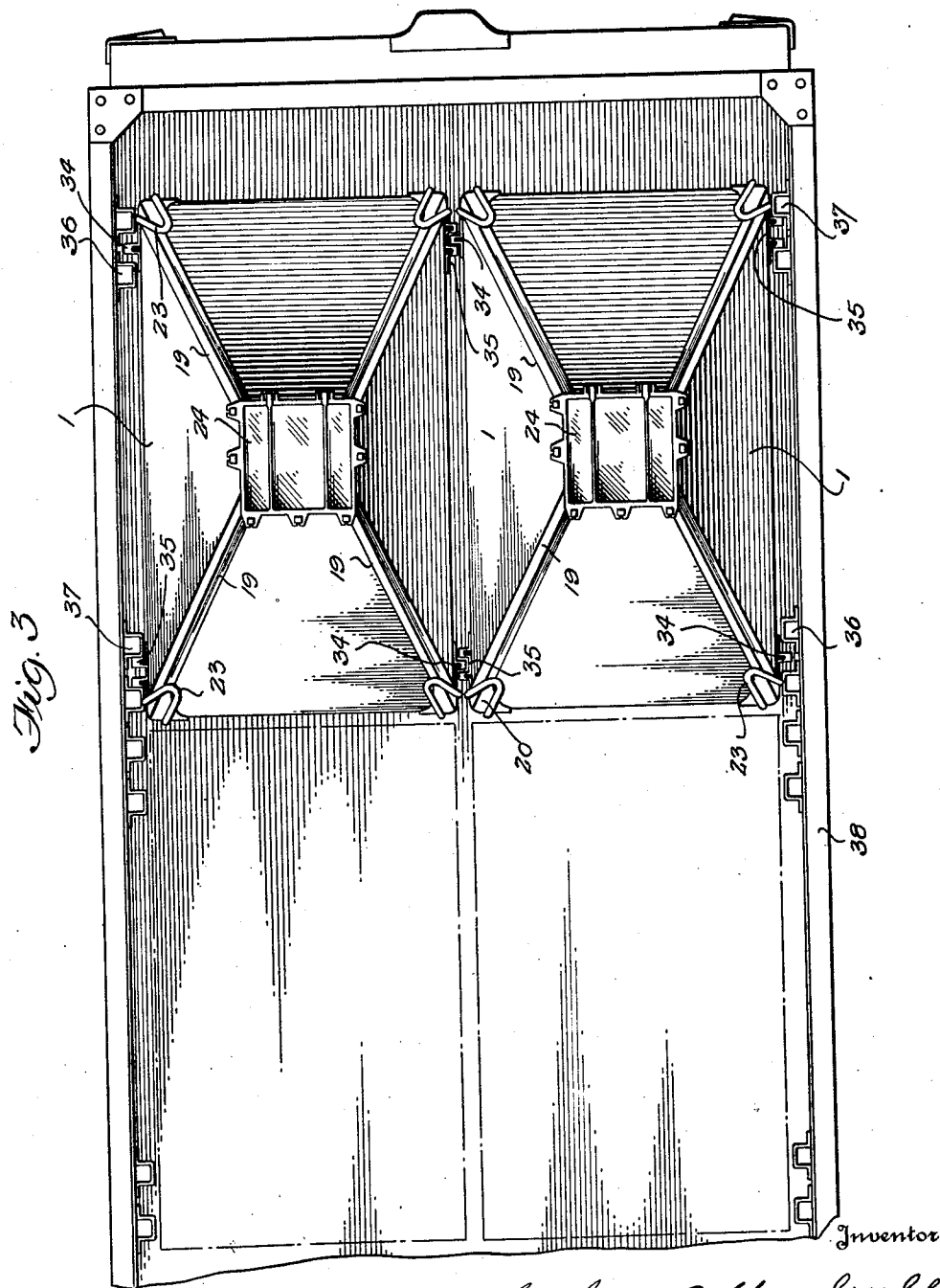
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AIR AND MOISTURE PROOF CONTAINER FOR CONTAINER CARS

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5 Sheets-Sheet 3



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AIR AND MOISTURE PROOF CONTAINER FOR CONTAINER CARS

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5 Sheets-Sheet 4

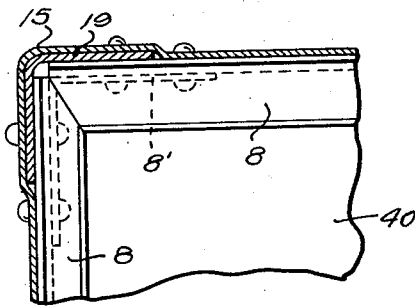


Fig. 4.

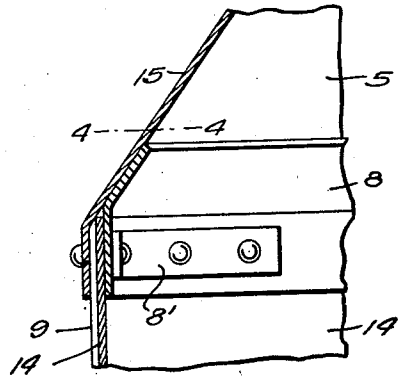


Fig. 5.

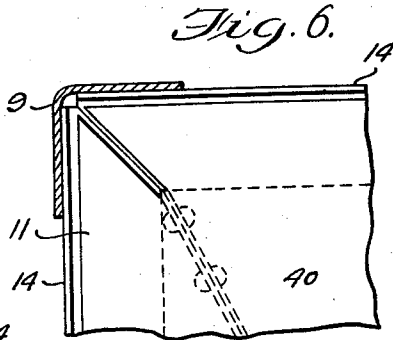


Fig. 6.

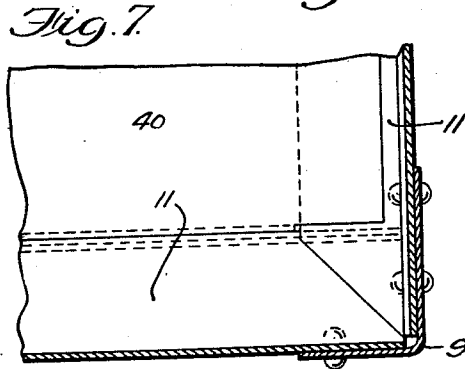


Fig. 7.

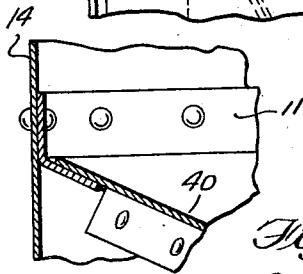


Fig. 8.

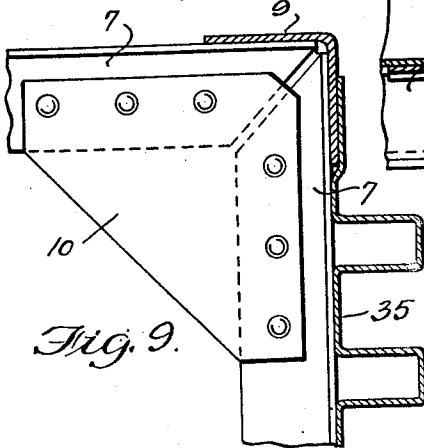


Fig. 9.

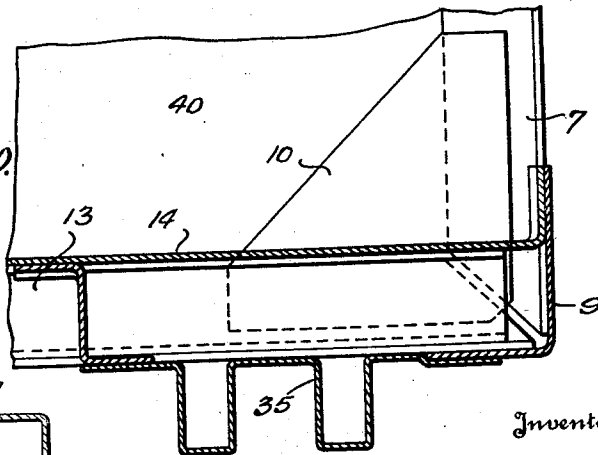


Fig. 10.

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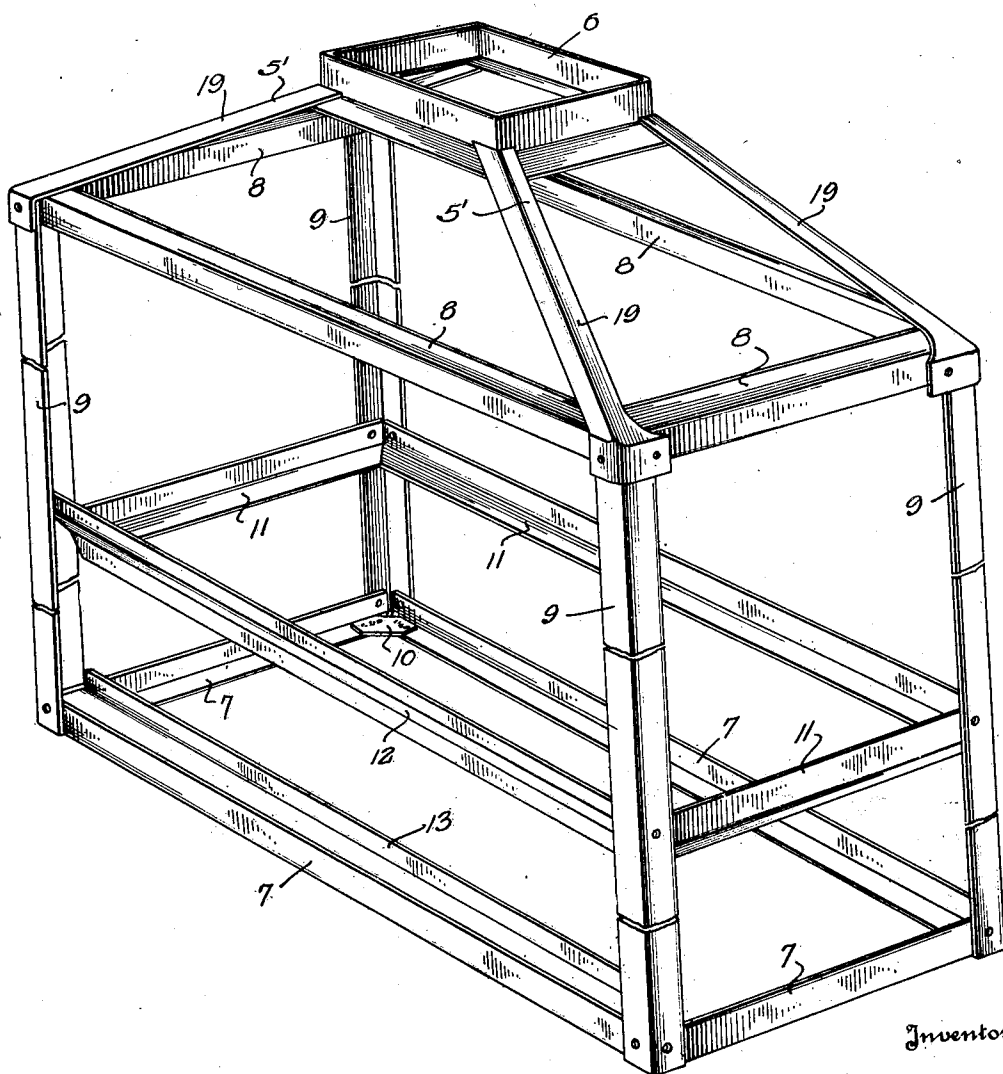
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5 Sheets-Sheet 5

Fig. 11.



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UNITED STATES PATENT OFFICE

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AIR AND MOISTURE PROOF CONTAINER FOR CONTAINER CARS

Application filed December 9, 1930. Serial No. 501,146.

This invention relates to goods containers for what are known as container cars, wherein individual containers for holding goods to be shipped are adapted to be disposed and held upon the container car body for separate removal and transportation to a consignee at a destination point.

Containers of this character have heretofore been designed and used for shipping various materials and commodities in bulk, including some, such as a cement and lime, that are deleteriously affected by exposure to air and rainwater or other moisture. Such containers as have heretofore been used, however, for the shipping for example of lime and cement are required to be only reasonably or to a fair degree proof against access of air or moisture, whereas a container for shipping calcium carbide or other substances which quickly gasify or liquefy on exposure to air or water must be of a hermetically sealing type and absolutely proof against entrance of air or moisture in order to be successfully used. Moreover, a container for bulk shipment of carbide must be constructed so as to be not only capable of being handled with a minimum degree of liability of injury thereto but of sustaining rough handling without danger of starting seams or otherwise causing damage allowing leakage of air or water into the container. In addition a container capable of successful use for shipping carbide must be of such construction as to readily shed water, to have any filling and discharge openings therein sealed securely against entrance of air or water, to be seamless or without seams liable to leak even under severe shocks and jars, to be proof against bursting from pressure of any gas unavoidably generated therein, and to be manufactured and operated at a saving over the cost of shipping the material in the usual way.

Under usual practice carbide is shipped in air and water-tight cans, each weighing approximately 300 lbs., which cans are loaded in ordinary box cars. A carload consists of approximately three hundred of these cans containing from 40 to 45 tons of carbide. Such cans are of the non-returnable type,

it being necessary to cut them open just prior to discharging the contents to the generator, and the cost of these containers and the inability to use them more than once makes the cost of packing and transportation comparatively high. This usual practice of shipping carbide in 300 lb. cans is sometimes departed from by the use of specially returnable containers holding a somewhat larger quantity and which, after being unloaded at the destination point, must be shipped for refilling back to the shipping point at freight charges.

The object of the present invention is to provide a container for shipping carbide in bulk, which may be repeatedly used and which will have the qualifications set forth required for successful use in the shipment of carbide and like materials. This container in practice may be made of any suitable size and containing capacity, but preferably is made of a capacity for holding 10,000 lbs. of carbide and of a size adapted for interchangeable use on a container car with brick and lime containers, thus enabling its use without change of structure of present container cars. This improved container embodies the advantage over ordinary carbide containing cans and special receptacles of the character referred to in holding and transporting many times the quantity of carbide in bulk at a time, and of being repeatedly used for this purpose, thereby saving the cost of the cans and the freight charges to the shipper for returning special containers freighted back in empty condition to the shipper; also by facilitating and reducing handling charges at the shipping and destination points.

A carbide container constructed in accordance with the invention is shown in the accompanying drawings, in which:

Fig. 1 is a front elevation of the container. Fig. 2 is a vertical longitudinal section thereof.

Fig. 3 is a top plan view of a portion of a container car and showing a pair of containers embodying the present invention mounted therein.

Fig. 4 is a section on line 4—4 of Fig. 5.

Fig. 5 is a section on line 5—5 of Fig. 2.
 Fig. 6 is a section on line 6—6 of Fig. 2.
 Fig. 7 is a section on line 7—7 of Fig. 1.
 Fig. 8 is a section on line 8—8 of Fig. 1.
 Fig. 9 is a section on line 9—9 of Fig. 2.
 Fig. 10 is a section on line 10—10 of Fig. 2.
 Fig. 11 is a perspective view of the frame-work.

Referring now more particularly to the drawings, 1 represents the improved container, which, generally speaking, comprises a body portion 2, a hopper bottom 3 having a discharge outlet 4, and a neck portion 5 provided with a filling mouth or inlet 6.

The body and hopper portions of the container are preferably of rectangular or oblong rectangular form, a container of oblong rectangular form being shown in the present instance, and such container is formed of a suitably pressed steel metal frame and steel sheet metal plates secured thereto. The framing consists, as shown, of a bottom horizontal framing 7, a top horizontal framing 8, each in the form of an oblong rectangular loop, and angle metal corner posts 9 extending between said top and bottom framings. The bottom framing 7 forms a base on which the container is designed to rest and consists of angle metal side and end bars or sills mitred at the ends and suitably connected by steel gussets 10 secured to the horizontal flanges of the sills, while the upper framing 8 consists of pressed steel bent side and end bars secured to each other and to knee braces 8' and uniting the upper ends of the L-shaped angle metal corner posts. In addition, an intermediate framing 11 formed of angle metal bars may be arranged along the sides and rear end of the container at the juncture of the body 2 with the hopper bottom 3, which bars will operate in conjunction with horizontal Z-bars 12 and 13 at the top and bottom of the outlet 3 and with the corner posts 9 with which they are connected to form a stiffening framing rigidly tying and uniting the posts and plates of the container body and bottom and the parts of the top framing 5' of the neck portion 5, to give great strength and rigidity to the container structure.

The formation of the body portion 2 and hopper bottom 3 is completed by steel sheet metal plates 14 of suitable thickness which are secured to the framing members 7, 8 and 11, to the corner posts 9 and to the Z-bars 12 and 13 to provide the front side and end walls of a main holding compartment and the side and front end wall of a bottom compartment, which bottom compartment is partitioned off and completed by other sheet metal plates to form a hopper bottom. Plates 15 similar to the plates 14 extend from the body 2 and top frame 8 upwardly to form the side and end walls of the neck portion 5, which is of tapering or frusto-pyramidal form and terminates at its restricted top in the mouth or

filling inlet 6, which is made of a pressed steel collar 15 having a vertical upper flange portion 17 and an outwardly and downwardly inclined bottom flange portion 18, to which latter the upper edges of the sheets 15 are secured. The sheets 14 and 15 are properly lapped with respect to each other and to the framing members and collar and are welded together or riveted in such manner as to make the seams absolutely air and watertight. The downwardly and outwardly sloping sheets 15 of the neck portion of the container not only provide a roof structure for the container which will shed ice, snow and water, but also provide an upper compartment leading from the main storage chamber in the body to receive therewith and with the hopper bottom the load of carbide, and which, on account of its progressively reduced cross-section from bottom to top, adapts the container to be filled solidly to the top so as to reduce the unoccupied space in the charge container to a minimum, thereby practically eliminating any space in the filled container for air or moisture which may have a deleterious action on the charge. The sheets forming the walls of the body and hopper bottom may be continuous between the framings 7 and 8 and secured thereto and to the framing 11 or separate sheets for the body and hopper portions may be used which will be properly lapped and welded or riveted at the joints. The sheets 15 are lapped at their corner angles by angle metal ridge bars 19 forming the top frame 5', extending from the collar 16 downwardly to the framing 8 and provided at their lower ends with caps 20 overlapping the sheets at their angles of intersection with the corner posts 9 and sheets 14, which ridge bars and caps are riveted or welded to the other parts referred to and seal all joints between the sheets 15 and stiffen and strengthen the same to obtain a neck portion of great strength and rigidity.

The container is provided with the lateral outlet 4 near its bottom and the inlet 6 at its top, in order to adapt it to be conveniently filled while in an upright position and to obviate the necessity of inverting it to discharge its contents through the top opening, which would require the provision of several manipulating means and increase the liability of damage to the container. This is the preferred construction employed, but, within the scope of the invention, the bottom outlet may be omitted and the opening 6 used both as inlet and outlet, where the user, for sake of cheapness of construction, is willing to assume the inconveniences and risks of the disadvantages mentioned.

Riveted or welded to the outer side of the flange 17 of the collar 16 is a holding ring 21, to which are pivoted swing bolts or equivalent fastening members 22. These bolts are

adapted for engagement with notches in keeper projections 23 on a cover or closure plate 24 designed to seal the inlet 6. This cover plate is provided with a body portion having marginal flanges 25 on which the keepers 23 are formed, the body being depressed below the plane of said flanges, which lie in an elevated plane parallel therewith. This construction of the cover body and its marginal flanges provides around the body and beneath the flanges a marginal recess receiving an angular metallic packing ring 26 which is arranged to seat upon and to be engaged by an inwardly extending flange from the holding ring 21, whereby, when the swing bolts 22 are engaged with the keepers 23 and the nuts thereof tightened, an absolutely reliable air and water-tight closure of the opening 6 will be effected.

The outlet 4 is provided with a seat frame 27 formed by angle metal top, bottom and side pieces, secured to the Z-bars 12 and 13 and to marginal portions of the plates 14 at the sides of the outlet. The frame bars 27 carry swing bolts 28 similar to the swing bolts 22, which are adapted for engagement with notched keepers 29 on the marginal flanges 30 of a closure plate 31, the body and flange of this plate being similar in construction to the body and flange of the cover plate 24 and forming a seat recess for an angle metal packing ring 32, whereby when the swing bolts 28 are engaged with the keepers 29 an absolutely reliable air and waterproof closure of the outlet 4 will be effected. It will be observed that the parts forming the outlet and its closure are set back of the plane of the plates 14 of the front wall so that said outlet and its closure lie wholly within the plane of the container, obviating liability of damage thereto in the handling of the container.

The container is provided at each of the reinforced upper corners of its body with a lifting eye or link 23, to permit handling of the container by overhead lifting devices in a well known way, and pressed steel guiding and retaining shoes or members 34 and 35 at the opposite sides adjacent the ends thereof for coaction with guiding and retaining members 36 and 37 on a gondola or other suitable container car 38 to position the container properly on the car with respect to other containers and to secure the same against displacement.

In practice, the loading, handling and unloading operations may be carried out as follows:

The container, with the closure 31 applied and closure 24 removed, is placed under a chute and the carbide allowed to flow from the chute through the filling opening 6 into the container until the latter is completely filled. The closure 24 is then applied and the filling opening sealed, thus making the

container air and moisture proof, whereupon the container is swung into position on the container car if not already on the car, and transported by the latter to its destination point. The container is then lifted from the car by engagement of suitable lifting means with its eyes or links 33 and swung into position above the bin or receptacle into which the load of carbide is to be discharged, the closure 31 then opened and the load permitted to flow by gravity out of the container into the receptacle. By this manner of discharging the load it will be seen that the load may be discharged while the container is in an upright or substantially upright position, thus obviating the necessity of turning it over or inverting it to discharge the load, which operation would require additional lifting devices and involve a greater risk of damage to the container while being manipulated.

In order to facilitate the discharge of the load, and to ensure the discharge of all the load while the container remains in a substantially upright position, the hopper or discharge portion 3 of the container may have its side walls 39 and bottom wall 40 sloping relatively to each other and toward the outlet 4, so that a gravity discharge with the container in upright position may be effected.

From the foregoing description, taken in connection with the accompanying drawings, the construction, mode of use and advantages of my improved container for container cars will be readily understood without a further and extended description, and it will be seen that a container is provided which is effectually adapted for safely handling and transporting carbide and other like substances. While the construction of the container as disclosed is preferred, it will, of course, be understood that changes in its form, construction and arrangement of parts, within the scope of the appended claims, may be made without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described my invention, I claim:—

1. An air and moisture proof goods container for container cars comprising a receptacle having a body portion provided with a discharge outlet at one side near its base, an upwardly tapering neck portion terminating in a filling inlet, said body and top portion conjointly providing a storage chamber of substantially uniform area in the body and of gradually diminishing area in the top portion, a bottom inclined toward the outlet, and air and moisture proof closures for the inlet and outlet.

2. An air and moisture proof goods container for container cars comprising a receptacle having a body portion provided with

a discharge outlet at one side near its base, an upwardly tapering neck portion terminating in a filling inlet, said body and top portion jointly providing a storage chamber of substantially uniform area in the body and of gradually diminishing area in the top portion, a bottom inclined toward the outlet, and air and moisture proof closures for the inlet and outlet, said outlet and its closure being arranged to lie wholly within the plane of the receptacle.

3. An air and moisture proof goods container for container cars comprising a receptacle having a body cross-sectionally of angular form and provided with a discharge outlet in one of its sides near its bottom, a frusto-pyramidal top portion terminating in a filling inlet, said body and top portion jointly providing a storage chamber of substantially uniform area in the body and of gradually diminishing area in the top portion, a bottom inclined from the remaining sides of the body toward the outlet, and air and moisture proof closures for the inlet and outlet.

4. An air and moisture proof goods container for container cars comprising a receptacle having a body cross-sectionally of angular form and provided with a discharge outlet in one of its sides near its bottom, a frusto-pyramidal top portion terminating in a filling inlet, said body and top portion jointly providing a storage chamber of substantially uniform area in the body and of gradually diminishing area in the top portion, a bottom inclined from the remaining sides of the body toward the outlet, and air and moisture proof closures for the inlet and outlet.

5. An air and moisture proof goods container for container cars comprising a receptacle having a body cross-sectionally of angular form and provided with a discharge outlet in one of its sides near its bottom, a frusto-pyramidal top portion terminating in a filling inlet, said body and top portion jointly providing a storage chamber of substantially uniform area in the body and of gradually diminishing area in the top portion, a bottom inclined from the remaining sides of the body toward the outlet, and air and moisture proof closures for the inlet and outlet, the outlet and its closure being arranged to lie wholly within the plane of the receptacle body.

6. An air and moisture proof goods container for container cars comprising a body portion of oblong rectangular form provided with an outlet in one of its sides near its base and having a neck portion of frusto-pyramidal form terminating in a filling opening at its top, said body and neck portions jointly forming a storage chamber of substantially uniform area in the body and of gradually diminishing area in the top por-

tion, a bottom sloping from the remaining three sides of the body toward the outlet, and air and moisture proof closures for the inlet and outlet, the outlet and its closure being arranged wholly within the plane of the receptacle body.

7. An air and moisture proof goods container for container cars comprising a receptacle having a body portion provided with a discharge outlet at one side near its base, a neck portion of progressively diminishing cross-section extending upwardly from the body portion and terminating at its top in a filling inlet, a bottom inclined toward the outlet, air and moisture proof closures for the inlet and outlet, and guiding and retaining means on the exterior of the receptacle for coaction with guiding and retaining means on a container car.

8. An air and moisture proof goods container for container cars comprising a receptacle having a body cross-sectionally of angular form and provided with a discharge outlet in one of its sides near its bottom, a frusto-pyramidal top portion terminating in a filling inlet, said body and top portion jointly forming a storage chamber of substantially uniform area in the body and of gradually diminishing area in the top portion, a bottom inclined toward said outlet, air and moisture proof closures for the inlet and outlet, means upon said receptacle whereby the same may be manipulated by mechanical lifting means, and guiding and retaining means on the exterior of the receptacle for coaction with guiding and retaining means on a container car.

9. An air and moisture proof goods container for container cars comprising a receptacle having a body cross-sectionally of angular form and provided with a discharge outlet in one of its sides near its bottom, a frusto-pyramidal top portion terminating in a filling inlet, said body and top portion jointly forming a storage chamber of substantially uniform area in the body and of gradually diminishing area in the top portion, a bottom inclined from the remaining sides of the body toward the outlet, air and moisture proof closures for the inlet and outlet, means on the receptacle whereby the same may be manipulated by mechanical lifting means, and guiding and retaining means on the exterior of the receptacle for coaction with guiding and retaining means on a container car.

10. An air and moisture proof goods container for container cars comprising a receptacle having a body cross-sectionally of angular form and provided with a discharge outlet in one of its sides near its bottom, a frusto-pyramidal top portion terminating in a filling inlet, said body and top portion jointly forming a storage chamber of substantially uniform area in the body and of gradually diminishing area in the top portion, a bottom

inclined from the remaining sides of the body toward the outlet, air and moisture proof closures for the inlet and outlet, the outlet and its closure being arranged to lie wholly within the plane of the receptacle body, means on the receptacle whereby the same may be manipulated by mechanical lifting means, and guiding and retaining means on the exterior of the receptacle for coaction with guiding and retaining means on a container car.

11. A container for use on container cars and for shipping carbide or like materials in bulk, comprising a body part and a top part forming a storage chamber of substantially uniform area in the body part and of gradually diminishing area in the top part, the said top part terminating at its top in an opening, means for hermetically sealing said opening, means on the container for engagement by suitable mechanism to move it onto and off the car, and guiding and retaining means on the container for coaction with guiding and retaining means on the car.

12. A container for use on container cars and for shipping carbide or like materials in bulk, comprising a body part and a top part forming a storage chamber of substantially uniform area in the body part and of gradually diminishing area in the top part, the said top part terminating at its top in an inlet and the body part terminating at its bottom in a discharge chamber having a lateral outlet, means for hermetically sealing the inlet and outlet, means on the container for engagement by suitable mechanism to move it onto and off the car, and guiding and retaining means on the container for coaction with guiding and retaining means on the car.

13. A container for use on container cars, comprising a container body of angular form in cross-section and having a pyramidal top provided with an opening at its apex, said body being provided with a hopper bottom formed with a lateral outlet in one of its vertical walls and having its side and bottom walls sloping toward said outlet, a sealing closure for the inlet, and a sealing closure for the outlet.

14. A container for use on container cars and for shipping carbide and like materials in bulk, comprising an angle metal main frame and an angle metal top frame, sheets secured to said frames and forming therewith a receptacle having a body of substantially uniform area and a top portion of progressively diminishing area toward its top, said top portion being provided at its top with an opening, and means for sealing said opening.

15. A container for use on container cars for shipping carbide or like materials in bulk, comprising a main frame formed of elements of angle metal and a top frame formed of elements of angle metal, sheet metal walls secured to said frames and form-

ing therewith a receptacle having a body portion of substantially uniform area and a top portion of progressively diminishing area toward its top and provided at its contracted top portion with an opening, the body portion having in one of its sides near its bottom an opening, and means for sealing said openings.

16. A container for use on container cars and for shipping carbide or like materials in bulk, comprising a body frame formed of angle metal frame elements and a top frame formed of angle metal frame elements, metal sheets secured to said metal frame elements, said frame elements and sheets forming a receptacle having a rectangular body portion of substantially uniform area and a frusto-pyramidal top portion of progressively diminishing area toward its top, one of the sides of the body portion and the contracted end of the top portion being provided with openings, and sealing means for said openings.

17. A container for use on container cars and for shipping carbide or like materials in bulk comprising an angle metal body frame and an angle metal top frame, sheet metal plates secured to said frames and providing a receptacle having a storage chamber comprising a body portion of substantially uniform area and a top portion of gradually diminishing area toward its top, said body portion having a side opening and inclined bottom walls leading thereto and said top portion having an opening at its contracted end, and closures for said openings.

18. A container for use on container cars and for shipping carbide or like materials in bulk comprising an angle metal body frame and an angle metal top frame, metal sheets secured to said frames, said sheets forming with the frames a receptacle having a body portion of rectangular form and substantially uniform area and a frusto-pyramidal top portion of gradually diminishing area toward its top, one of the walls of the body portion and the contracted upper end of the frusto-pyramidal top portion being provided with openings, sealing means for the opening in the top portion, auxiliary frame members secured to the frame members of the body portion and forming therewith a doorway and a door seat frame lying wholly inside the plane of the container, and a door for closing said doorway.

In testimony whereof I affix my signature.

GRAHAM C. WOODRUFF.