H. A. POPPENHUSEN AND A. P. STRONG.

STORAGE TANK OR RECEPTACLE.

APPLICATION FILED DEC. 2, 1918.

1,311,296.

Patented July 29, 1919.

4 SHEETS—SHEET 1.

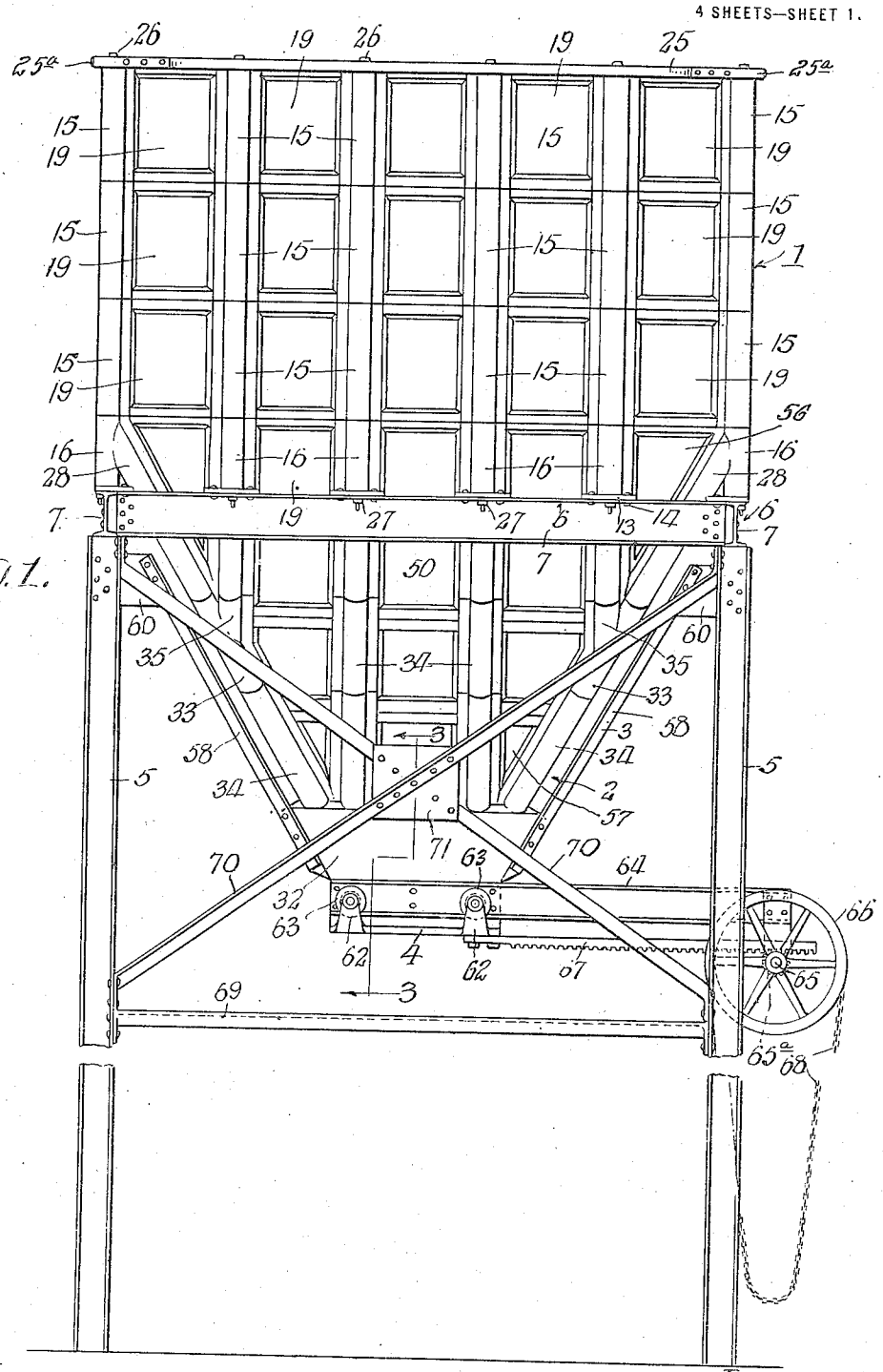


Fig. 1.

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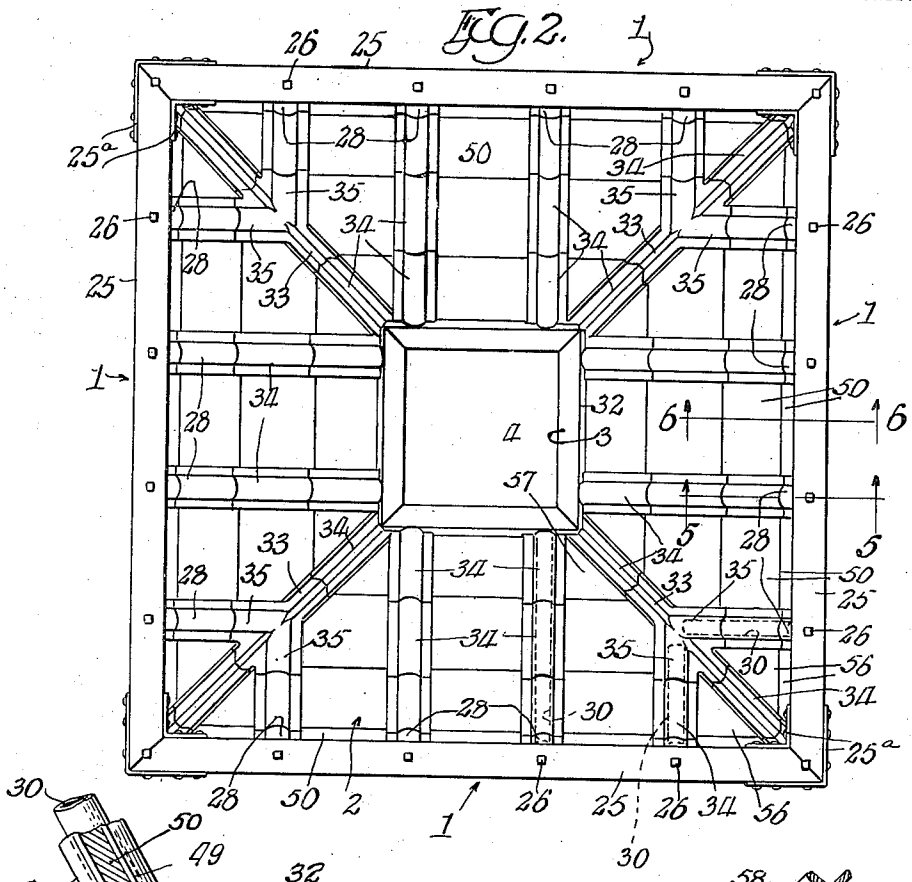
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4 SHEETS—SHEET 2.

FIG. 2.



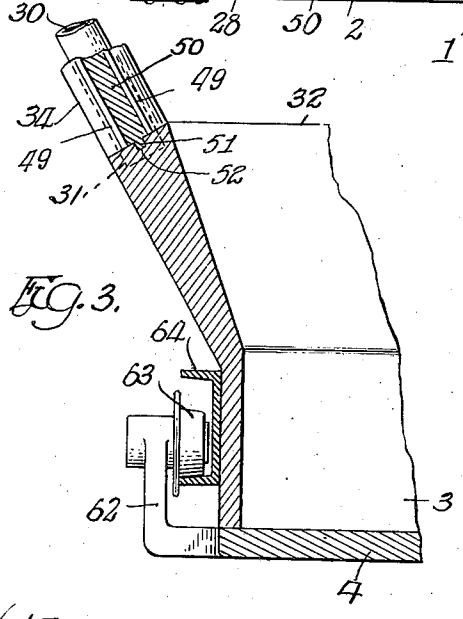


FIG. 3.

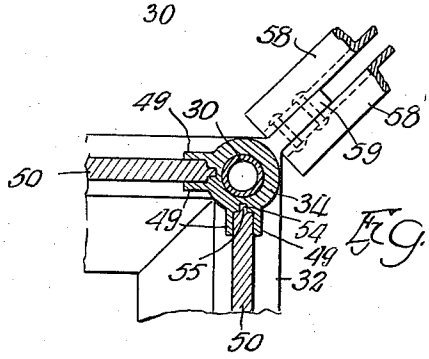


FIG. 4.

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4 SHEETS—SHEET 3.

FIG. 5.

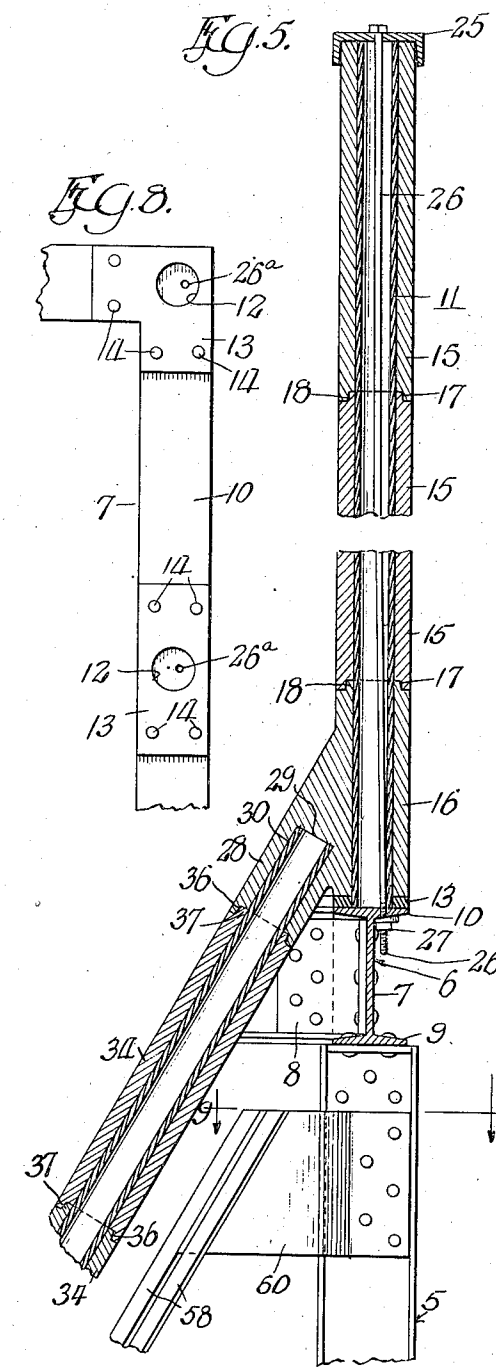


FIG. 6.

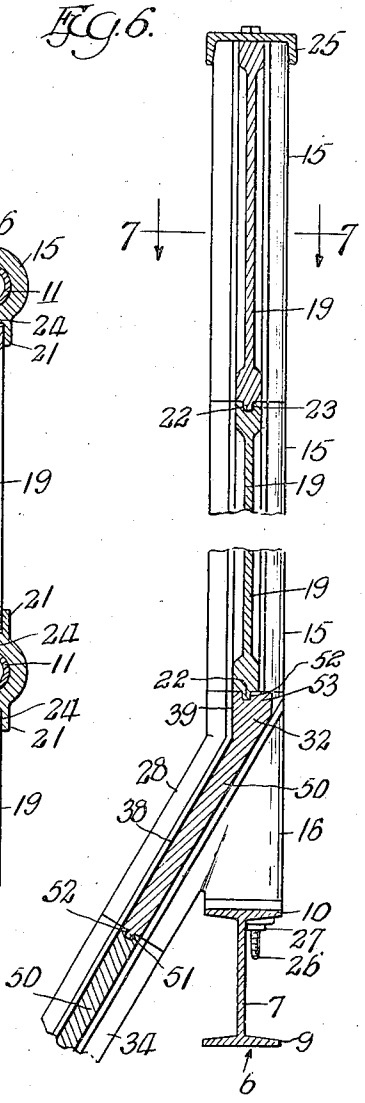


FIG. 8.

FIG. 7.

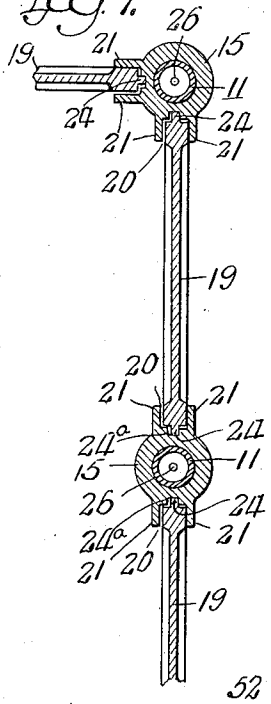
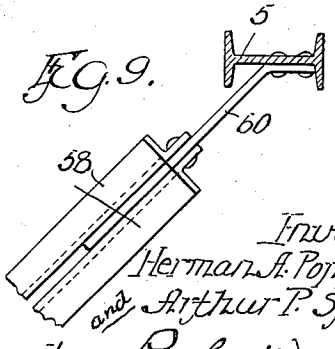


FIG. 9.



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4 SHEETS—SHEET 4.

FIG. 10.

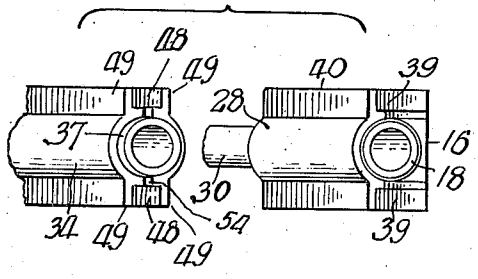
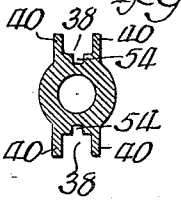


FIG. 11.



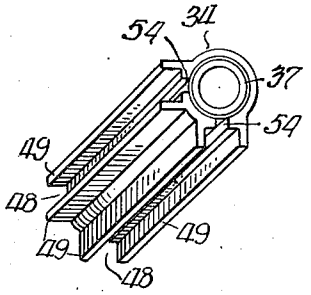


FIG. 12.

FIG. 13.

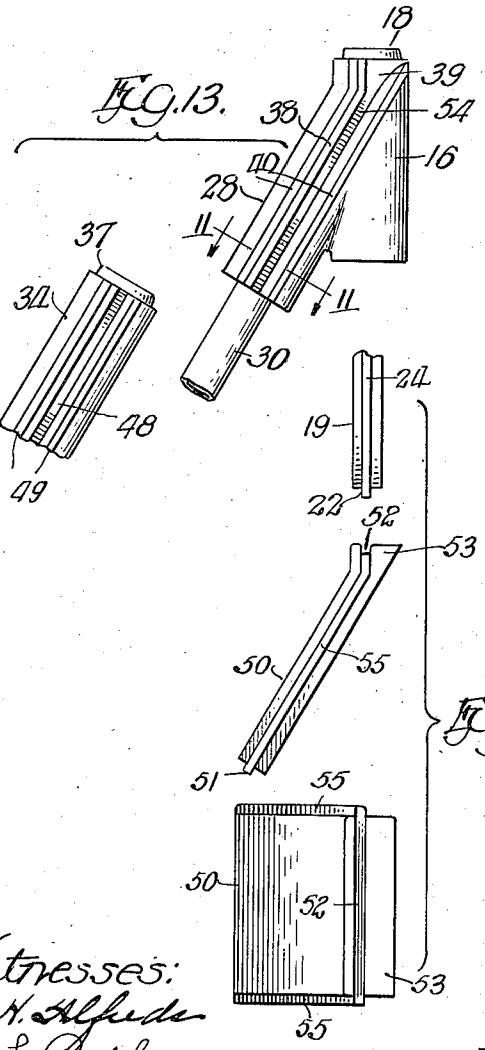


FIG. 14.

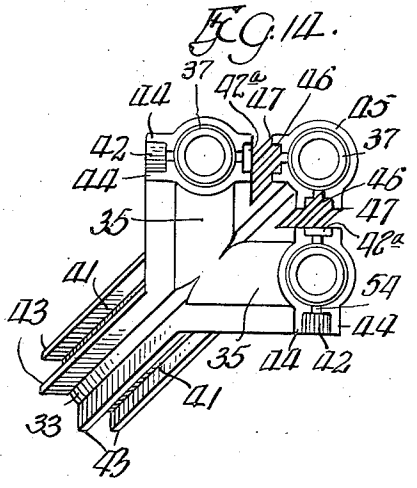


FIG. 15.

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UNITED STATES PATENT OFFICE.

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STORAGE-TANK OR RECEPTACLE.

1,311,296. Specification of Letters Patent. Patented July 29, 1919.

Application filed December 2, 1918. Serial No. 264,885.

To all whom it may concern:

Be it known that we, HERMAN A. POPPENHUSEN, a citizen of the United States, residing at Hammond, in the county of Lake and State of Indiana, and ARTHUR P. STRONG, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Storage-Tanks or Receptacles, of which the following is a specification.

This invention relates to receptacles or storage tanks of the type which are usually elevated and are particularly used for the collection and disposal of granular, pulverulent, or disintegrated material, such as ash, grain, rock salt, coke breeze, and the like.

A receptacle of the character referred to is usually provided with an upright marginal wall and a hopper bottom having a discharge opening at its lower end, through which the material deposited in the receptacle may be discharged into cars, wagons, or other vehicles for removal and ultimate disposal. Among the objects of our invention is to improve the construction of receptacles of such character in the several particulars as will hereinafter more fully appear, and to provide in particular a receptacle that is constructed of a number of comparatively small units or sections, requiring in their production a minimum amount of machining and permitting the shipment or transportation of the complete structure in the so-called "knock-down" form to the place of installation or erection of the same. A further object of our invention is to provide the several sections or units of the receptacle, which form the walls of the same, with interfitting parts so that the joints formed between such sections or units will prevent the material deposited in the receptacle from leaking out of the same, and furthermore, prevent dust, dirt, and moisture from entering the receptacle from the exterior thereof. A further object of our invention is to so construct and arrange the sections or units of the receptacle that the weight of such parts will be supported by a base frame at the bottom of the upright marginal wall of the receptacle and the corner posts or other foundation upon which the base frame rests and is secured. A still further object of our invention is to provide means for holding said several units or sections from lateral as well as vertical displacement so that the units or sections will be held against movement in a direction to open up the joints between such parts. And a further object of our invention is to have the vertical or side edges of the sections or units forming the metal plates or panels of the upright marginal or side wall of the receptacle engaged in such a manner with the units or sections interposed between such edges of the panels or plates that a plurality of receptacles or tanks may be erected side by side with the contiguous side wall being common to the receptacles on opposite sides thereof and forming a partition wall between same.

The invention consists further in the matters hereinafter described and more particularly pointed out in the appended claims.

In the accompanying drawings—

Figure 1 is a side elevational view of a receptacle or storage tank constructed in accordance with our invention;

Fig. 2 is a top plan view of the same;

Fig. 3 is an enlarged vertical sectional view taken on the indirect line 3—3 of Fig. 1;

Fig. 4 is a horizontal sectional view taken through one of the corners of the valve body at the lower or discharge end of the hopper bottom of said receptacle;

Fig. 5 is an enlarged fragmentary vertical sectional view taken on line 5—5 of Fig. 2;

Fig. 6 is an enlarged fragmentary vertical sectional view taken on line 6—6 of Fig. 2;

Fig. 7 is a transverse or horizontal sectional view taken on line 7—7 of Fig. 6;

Fig. 8 is a fragmentary top plan view of a portion of the base frame at one of the corners thereof and with the upright walls of the tank or receptacle omitted for the sake of clearness of illustration;

Fig. 9 is a transverse sectional view taken on line 9—9 of Fig. 5;

Fig. 10 is a top plan view of one of the base sleeves or tubular members employed

in the upright walls of the tank or receptacle and showing separated therefrom the adjacent sleeve or tubular member which forms a part of the hopper bottom of said receptacle;

Fig. 11 is a transverse sectional view taken on line 11—11 of Fig. 13;

Fig. 12 is a perspective view of one of the corner sleeves or tubular members used in the hopper bottom construction;

Fig. 13 is a side elevational view of the parts shown in Fig. 10;

Fig. 14 is a top plan view of one of the other types of corner sleeves used in the hopper bottom construction; and

Fig. 15 is a view of certain of the removable panels or wall sections to be hereinafter referred to in detail.

The storage tank or receptacle, illustrated in the accompanying drawings and constructed in accordance with our invention, is of the type having a marginal wall composed of a plurality of connected upright side walls 1, 1, and a hopper bottom 2 extending downward from the base of said marginal wall and provided at its lower end with a discharge opening 3 controlled by a movable valve or gate member 4, which when opened permits the material deposited in said tank or receptacle to be discharged therefrom into a wagon, car, or other vehicle moved or backed beneath the tank or receptacle for that purpose. Said tank or receptacle is elevated or supported the distance required above the surface of the ground or platform as the case may be, by a plurality of upright posts 5, 5, located at the corners of the receptacle when the latter is made rectangular in shape as shown in the drawings. Said receptacle may be made circular or any other shape desired, without departing from the spirit and scope of our invention, and, further, be elevated to the height required by any suitable means or structure. Said upright side walls 1, 1 rest on and are connected with a frame 6 horizontally arranged at the base of said walls and secured to and seated on the upper ends of said posts 5, 5, as shown in the drawings. Said base frame 6 is made of a plurality of metal members 7, 7, preferably in the form of I-beams connected together at the corners of the frame by structural steel corners or other fastenings 8 provided for that purpose, and as shown in Fig. 5. As illustrated in the drawings, there are four of said I-beams 7, 7, one for each upright wall 1, 1 and extending the full width thereof. Each I-beam 7, 7 is arranged with its central web vertical so that its base or lower web 9 (Figs. 1, 5, and 6) is horizontal and rests on and is secured to the upper ends of the corner posts 5, 5 at the ends of said I-beam. The upper webs 10 of said I-beams 7, 7 are also horizontal and are in the same horizontal plane and are the immediate parts upon which the upright walls 1, 1 rest. Said upright walls 1, 1 are made alike and are composed of a plurality of units or sections which may be shipped in knock-down form and be assembled together at the place of erection of the tank or receptacle. Said upright walls are constructed as follows. Extending upward from the base frame 6 at the corners thereof and also at a plurality of spaced points in the length of each I-beam 7, is a plurality of upright tubular members or pipes 11, 11, all having the same length so that their upper ends terminate in the same horizontal plane. The pipes 11 in each side wall 1 are spaced the same and equal distances apart, and in the particular receptacle shown there is an equal number of pipes 11 in each side wall 1. The length or height of the pipes 11 will of course depend upon the height of the receptacle being made. The lower end of each pipe 11 seats or rests on the top surface of the web 10 of the associated I-beam 7, and is received in an upwardly opening socket or recess 12 provided for that purpose in a flat anchor plate 13 secured to said web 10 by fastening members or rivets 14, 14, as shown in Figs. 1, 5, and 8. By such construction, the lower end of each pipe 11 is removably connected with the base frame 6 and held against lateral displacement. Between the ends of the I-beams 7, 7, the anchor plates 13 are made straight throughout their length, while at the corners of the frame the anchor plates 13 are made corner-shaped, as shown in Fig. 8. Applied endwise over each pipe 11 is a plurality of tubular members or sleeves 15, 15, and 16, the latter being the lowermost one and having its lower end resting on the associated anchor plate 13, as shown in Figs. 1, 5, and 8. The opposed ends of said sleeves 15, 16 abut and are provided at their abutting ends with interfitting parts to form joints preventing the material deposited in said tank or receptacle from flowing or leaking out of the same and to prevent dirt, dust, moisture, and the like from entering the receptacle between such parts from the exterior thereof. The type of joint, as shown in Fig. 5, comprises an annular socket or recess 17 in the lower end of one sleeve to receive an upwardly projecting annular rib or projection 18 at the upper end of the sleeve therebelow.

Removably inserted between the upright members or pipes 11, 11 in each side wall 1, 1, is a plurality of flat metal panels or plates 19, 19, vertically arranged one above the other and extending across the spaces between said pipes, as shown in Figs. 1 and 7. The panels or plates 19 are connected with the pipes 11 at the sides thereof, and are also connected together at their opposed edges in such a manner that, while the plates or

panels may be removed from and inserted between the pipes, yet when inserted in place the joints between the parts will be of a type serving the same purpose as the joints formed between the abutting ends of the sleeves 15, 16. In the drawings, we have shown a form of construction for accomplishing such purpose. As illustrated, the side or vertical edges of the plates or panels 19 extend into vertical channels or slideways 20 provided in the sleeves 15, 15 at the side edges of the panels. Said channels 20 are formed between flanges 21, 22, preferably made integral with the associated sleeves. The sleeves 15 on the corner pipes 11 have the flanges 21 of one channel 20 arranged at right-angles to the flanges 21 of the other channel 20 of the same sleeves, as shown in Fig. 7, while the sleeves 15 on the other pipes 11 have the channels 20 at diametrically opposed sides thereof, as shown in said Fig. 7. The reason for such arrangement is apparent when constructing a rectangularly shaped receptacle or tank as shown in the drawings. Should the tank or receptacle being constructed have a circular or other cross-sectional shape, the channels in the sleeves 15 would be arranged at the angles required to suit the requirements of the particular construction. The panels 19 are made alike and have the same dimensions throughout so that any panel may be used in any one of the side walls 1 and be interchangeable with other panels in such walls, thereby avoiding the necessity of making a separate set of panels 19 for each of the side walls 1. Between each two opposed upright pipes 11, 11 is a series or set of said panels 19, there being three in number in the type of receptacle or tank shown in the drawings. The number of panels 19 would of course depend upon the height of the receptacle being made. In the particular receptacle shown, the panels 19 of each tier or vertical section rest edgewise upon each other, as shown in Figs. 1 and 6, and the uppermost panel or plate 19 is provided along its lower edge with a downwardly extending rib or tongue 22, which is received in an upwardly opening groove 23 in the upper edge of the panel 19 immediately therebelew. A like tongue and groove connection (22, 23) is provided at the meeting edges of the various panels 19 to form joints, for the purpose heretofore stated. The panels 19 have the same height as the sleeves 15 between which they are applied, and the tongue or rib 22 and groove 23 on each panel 19 extend the full width of the same. To provide a like type of joint between the side or vertical edges of the panels or plates 19 and associated sleeves 15, 15, each panel is provided along each side edge thereof with an outwardly extending tongue or rib 24 entering and slidably received in a vertical groove 24^a provided in the bottom of the channel 20, as shown in Fig. 7. After the sleeves 15 and 16 and panels 19 have been assembled in place to form the upright side walls 1 of the tank or receptacle, a channel-iron 25 is applied about the upper edge of each side wall 1, with its side flanges or webs extending downward on each side of the sleeve and uppermost panels 19, as shown in Figs. 1, 5, and 6. Said channel-irons 25 are secured in place by a plurality of vertically extending tie-rods 26, one extended through each pipe 11 and having its lower or threaded end extended downward through a hole or aperture 26^a in the upper horizontal web 10 of the I-beam 7 and there provided with a clamp nut 27, as clearly shown in the drawings. The upper end of each rod 26 extends upward through and slightly beyond the channel-iron 25, and is there provided with an enlarged or headed part, as shown. By such construction, the sleeves 15 and 16 and the panels 19 are held in place and prevented from moving upward in a manner which would open the joints between the parts. The channel-irons 25 meet at the corners of the tank or receptacle, and are there connected together by corner fastenings 25^a, as shown in Fig. 2.

The hopper bottom 2 has four downwardly and inwardly inclined side walls which are also made of a plurality of removably connected units or sections so that such portion of the tank or receptacle may also be shipped or transported in knock-down form and be assembled at the place of erection of the receptacle. Said hopper bottom is constructed as follows. The lowermost sleeve 16 on each upright pipe 11 is provided with an inwardly and downwardly inclined tubular extension 28 having a socket 29 opening through the lower end of said extension 28 to receive the upper end of an inclined tubular member or pipe 30, as shown in Fig. 5. There are as many pipes 30 as there are pipes 11, the former constituting in effect downwardly and inwardly inclined continuations of the latter. The pipes 30 at the corners of the hopper bottom 2 converge downward toward each other and terminate in the same horizontal plane adjacent the lower end of said hopper. The lower ends of said corner pipes 30 are received in upwardly opening sockets 31 formed for that purpose in the upper edge of the rectangular valve body 32 at the corners thereof, as shown in Fig. 3. Said valve body 32 is at the lower end of the hopper and surrounds and forms the upright side walls of the discharge opening 3. As sh wn by dotted lines in Fig. 2, those inclined pipes 30 adjacent each corner of the hopper and on each side of the associated corner pipe 30 converge toward the interposed corner pipe 30 and terminate short thereof. Such inclined pipes do not extend

to the valve body 32, as shown. The remaining pipes 30 in each side wall of the hopper are arranged parallel and have their lower ends terminating at the valve body 32 and received in sockets 31, the same as the corner pipes 30. Applied endwise over each inclined corner pipe 30 is a plurality of tubular members or sleeves 33, 34. In the particular tank shown, there are three of such sleeves on each corner pipe 30, with a sleeve 33 interposed between the sleeves 34, 34. The intermediate sleeve 33 abuts at its upper end against the lower end of the sleeve 34 thereabove, and the latter abuts at its upper end against the lower end of the tubular extension 28 thereabove, as shown in Fig. 2. The lowermost sleeve 34 abuts at its upper end against the lower end of the intermediate sleeve 33, while the lower end of said lowermost sleeve 34 rests on the upper edge of the valve body 32, as shown in Figs. 2 and 3. There is a sleeve 33 at each of the four corners of the hopper bottom, and each sleeve 33 is provided with two upwardly projecting tubular projections 35, 35, arranged at the required angle to the body of the sleeve 33, as shown in Figs. 1 and 14. Each projection 35 receives the lower end portion of the short pipe 30, and abuts at its upper end against the lower end of the sleeve 34 interposed between it and the associated extension 28. On the other pipes 30 are applied sleeves 34, as shown in the drawings. As shown in Fig. 5, the extension 28 is provided in its lower end with a socket or recess 36, into which extends an annular projection 37 at the abutting end of the sleeve 34. Such interfitting parts 36 and 37 perform the same function as the interfitting parts (17 and 18) at the abutting ends of the sleeves 15 and 16 hereinbefore described. The other sleeves of the hopper bottom 2 are provided at their abutting ends with like interfitting parts (36, 37) for the same purpose, and a like joint may be provided between the upper edge of the valve body 32 and the lower end of each sleeve 34 resting thereon. Each extension 28 is provided on opposite sides thereof with an outwardly opening groove or channel 38 having the same inclination as the extension 28 and extending the full length thereof, as shown in Figs. 10, 11, and 13. The upper end 39 of said channel 38 is widened and extends vertically upward to register with and form a downward continuation of the channel 20 in the sleeve 15 thereabove, as shown in Fig. 6. Said channels 38, 38 are formed between flanges 40, 40 being integral with and extending outward from the sides of the sleeves 28, as shown in said Figs. 10, 11, and 13. Each sleeve 33 is provided with two outwardly opening grooves or channels 41, 41 extending along the sides of the sleeve and opening into and forming continuations of the grooves or channels 42, 42 formed along the outer sides of the angular projections 35, 35 of said sleeves 33, 33, as best shown in Fig. 14. The channels 41 are formed between outwardly projecting flanges 43, 43 integral with the body of the sleeve 33, while the channels 42 are formed between similar flanges 44, 44 integral with the body portions of the angular projections 35. Each projection 35 is provided with a like groove or channel 42^a along one of the inner sides thereof, while the opposed upper portion 45 of the sleeve 33 is provided with grooves or channels 46, 46 formed between flanges 47, 47. Each sleeve 34 at the corners of the hopper is provided along each side thereof with an outwardly opening groove or channel 48, 48 formed between outwardly projecting flanges 49, 49 formed integral with the body of the sleeve, as shown in Fig. 12. In the case of such sleeves, the channels 48 are at about right-angles to each other, as required at the corners of the hopper bottom. With respect to the other sleeves 34, between the corners of the hopper, the channels 48 and flanges 49 are on diametrically opposed sides of the sleeves, as shown in Figs. 10, 11, and 13. Otherwise, the sleeves 34 are the same. The sleeves 33, 34 are assembled in the manner shown in Figs. 1 and 2 with their corresponding grooves or channels registering with one another and opening toward the similar grooves or channels in the set of sleeves opposite so as to form a slideway for the insertion therein of metal panels or plates 50. Said plates 50 have their side edges received in the channels in the sleeves between which the plates extend, in substantially the same manner as the panels 19. The plates 50 in each tier rest edgewise one upon the other, as shown in Figs. 1, 2, and 6, and are provided at their meeting ends, one with a tongue or rib 51 and the other with a groove 52 to form a joint between such parts for the same purpose as the joint formed between the meeting edges of the metal panels or plates 19 hereinbefore described. Each of those plates or panels 50 at the sides of the hopper bottom and between the corners thereof have their upper ends 53 enlarged and projecting vertically upward, as shown in Fig. 6, so as to form a seat for the plate 19 immediately thereabove. The meeting edges of said plates 19 and 50 are provided with a tongue and groove type of joint of the same character as just described. The upper ends 39 of the channels 38 are widened or made enlarged so that the entrance end of the channel will permit the plates 50, 50 to be slid into position to form the side walls of the hopper bottom from the upper end of the channels 38 after the pipes and sleeves forming the framework of the tank or receptacle have been assembled in place. This therefore enables the panels 50

forming the side walls of the hopper bottom to be slid into place before the plates or panels 19 forming the upright side walls of the receptacle are inserted in place. In the bottom of each of the channels 38, 41, 44, and 46 of the several sleeves 33, 34 in the hopper bottom, is provided a groove 54 designed to receive therein a longitudinally extending rib or projection 55 on the side of each plate 50 in order to provide a joint between such parts for the same purpose as the tongue and groove joint between the sides of the panels 19 and the sleeves 15 and 16. By reason of the angles at the corners of the hopper bottom 2, it is necessary that the metal panels or plates at such corners have a shape of the character permitting the plates to conform to the angular shape formed between the parts at such corners. In Figs. 1 and 2, the angularly shaped plates at the upper corners of the hopper bottom 2 are indicated by 56, while the angularly shaped plates at the bottom corners of the hopper bottom are indicated by 57.

The hopper bottom 2 is connected with the corner posts 5 so that the weight of such parts is exerted on or rests upon the posts, thereby relieving the base frame 6 and the superstructure thereabove from supporting any weight of the hopper bottom. To accomplish this there are provided at each of the four corners of the hopper bottom a pair of angle bars 58, which extend along the outside of the hopper bottom at the same angle as the latter, and are secured by rivets or other suitable fastenings to an outwardly projecting lug or ear 59 provided for that purpose at each of the corners of the valve body 32, as shown in Fig. 4. The upper ends of said bars 58 terminate short of the base frame 6, and the upper ends of the corner posts 5, as shown in Figs. 1 and 5, are there secured by rivets or other fastening members to an inwardly extending web 60, which is rigidly secured to the associated corner posts 5.

The discharge opening 3 in the valve body 32 at the bottom of the hopper is opened and closed by the valve member 4, which in the type of tank or receptacle illustrated takes the form of a flat, horizontally arranged plate designed to be slid back and forth beneath the bottom of the discharge opening 3 for the purpose of opening and closing the same. Said plate or sliding gate 4 is provided at two opposed sides thereof with upwardly extending arms 62 having rollers 63 journaled at the upper ends thereof. Said rollers 63 travel on channel-shaped track members 64 secured to the outer sides of the valve body 32, as shown in Figs. 1 and 3. Said track members 64 project outward beyond one side of the valve body 32, as shown in Fig. 1, so that the gate or valve 4 may be moved into a position fully uncovering the discharge opening 3. To slide the gate or valve 4 into open and closed positions, the track members 64, 64 are extended outward past and between the associated corner posts 5, 5, and suspended from the outer ends of said track members is a horizontal shaft 65, to which is secured a rag wheel or sheave 66. Said shaft 65 is provided between its ends with two pinions 65[a] (one of which being shown) upon which rest and mesh rack bars 67, the latter being secured to the under side of the gate or valve plate 4. The rag wheel 66 is rotated manually by the operator pulling on an endless chain or cable 68 trained over the rag wheel for that purpose.

The corner posts 5, 5 are tied together between their ends by horizontal strut members 69. Said strut members are positioned a sufficient distance above the lower ends of the corner posts or surface of the ground or platform, as the case may be, so as not to hinder the movement of the car or wagon beneath the bottom of the hopper 2. Said corner posts 5, 5 are further tied together around all sides of the tank or receptacle by a pair of intersecting tension members 70, 70 joined together at their mid-point by a plate 71 or the like.

A tank or receptacle constructed in the manner herein described and shown in the drawings comprises for the most part a comparatively large number of small sections or units, requiring little or no mechanical or machine work in their production, and of such a size as to permit the same to be conveniently shipped and handled in "knock-down" form, thus enabling the manufacturer to transport the complete receptacle at a comparatively low cost. Furthermore, the units or sections permit the tank or receptacle to be erected on the ground with ease and at small expense, inasmuch as skilled labor, such as structural steel workmen and the like, is not required in the erection of the receptacle. By using sectional walls and units interfitting therewith permits the removal and repair of any part of the receptacle which may be broken or worn out, without dismantling the entire receptacle. Moreover, the sectional arrangement permits the use of cast-iron in the construction of the walls, in that plates of cast-iron of the size permitting of their convenient transportation and handling may be employed. By constructing the tank or receptacle in the manner described and shown, the weight of the several parts rests upon the base frame 6 and the upright supporting posts 5, 5, thereby producing a rigid structure and one capable of withstanding great weight, even though made or built of a plurality of comparatively small sections or units. Then again, by having the panels or plates 19, 19 connected with each other at their opposed

edges and providing a channel type of connection between their side or lateral edges and the pipes or other parts interposed between the side edges of the plates, the side faces or surfaces of the upright walls 1, 1 are practically continuous throughout and unbroken at the joints between the parts, thereby permitting a plurality of receptacles to be built side by side with the contiguous side wall of the adjacent receptacles being common to the receptacles on opposite sides thereof and forming the partition between the same. Moreover, such feature is further rendered practicable because the type of joint formed with the meeting edges of the panels 19 and sleeves 15 prevents the material deposited in the receptacles formed on each side of such partition wall from leaking or flowing into either of such receptacles. The receptacle may be provided with a roof or cover of a sectional or other design, and when using the receptacle or tank for receiving ashes, the latter may be supplied thereto through the upper end of the receptacle through a suitable conveyer pipe forming part of the ash handling system. The receptacle is particularly adapted for the storage of granular, pulverulent or disintegrated material, such as ash, rock salt, grain, coke breeze, special ores for refining plants, sand, cement, crushed stone, or the like, and by providing interfitting parts at the joints between the several sections or units of the structure, the material deposited in the receptacle is prevented from leaking through such joints, and, furthermore, the receptacle rendered proof against dirt, dust, moisture, and the like from the exterior thereof.

While we have shown and described in detail a tank or receptacle constructed in accordance with our invention, yet it is to be of course understood that the various details of construction and arrangement of parts may be variously modified and changed without departing from the spirit and scope of our invention.

We claim as our invention:

1. A receptacle having a wall, comprising a base member, a plurality of upright members laterally spaced apart and supported by said base member, and a plurality of panels or plates removably inserted between and having engagement with said upright members.

2. A receptacle having a wall, comprising a base member, a plurality of upright members laterally spaced apart and supported by said base member, and a plurality of panels or plates removably inserted between said upright members and having at the sides thereof interlocking connection with said upright members.

3. A receptacle having a wall, comprising a base member, a plurality of upright members laterally spaced apart and supported by said base member, a plurality of panels or plates removably inserted between said upright members, and means connecting the said panels with said upright members, comprising vertical channels on one of said parts for receiving vertical portions on the other of said parts.

4. A receptacle having a wall, comprising a base member, a plurality of upright members supported by said base member and being laterally spaced apart and provided with vertical channels, and a plurality of panels or plates removably inserted between said upright members and having their vertical edges in the channels thereof.

5. A receptacle of the character described having a marginal wall, comprising a base member, a plurality of upright members laterally spaced apart and having their lower ends resting on said base member and provided with vertical channels, and a plurality of panels or plates removably inserted between said upright members and having their vertical edges in the channels thereof; the plates between said upright members resting endwise upon each other and having interfitting parts at their abutting ends.

6. A receptacle of the character described having a marginal wall, comprising a base member, a plurality of upright members laterally spaced apart and having their lower ends resting on said base member and provided with vertical channels, and a plurality of panels or plates removably inserted between said upright members and having their vertical edges in the channels thereof; the panels between said upright members resting endwise one upon the other and having interfitting parts at their abutting ends and interfitting parts between the vertical edges of said plates and the bottoms of said channels.

7. A receptacle of the character described having a marginal wall, comprising a plurality of upright members laterally spaced apart, a plurality of sleeves on each of said members, and a plurality of panels or plates removably inserted between said members, and having engagement with said sleeves.

8. A receptacle of the character described having a marginal wall, comprising a plurality of upright members laterally spaced apart, a plurality of sleeves on each of said members and provided with vertical channels, and a plurality of panels or plates removably inserted between said members and having their vertical edges in the channels of the sleeves thereon.

9. A receptacle of the character described having a marginal wall, comprising a plurality of upright members laterally spaced apart, a plurality of sleeves on each of said members and having interfitting parts at their abutting ends, said sleeves having vertical channels therein, and a plurality of

panels or plates removably inserted between said members and having their vertical edges in the channels in the sleeves thereon; the plates between said members resting endwise one upon the other and having interfitting parts at their abutting ends, and interfitting parts between the lateral edges of said plates and said sleeves.

10. A receptacle of the character described having a marginal wall, a base member, a plurality of upright members laterally spaced apart and having their lower ends resting on said base member, a plurality of sleeves on each of said upright members and having interfitting parts at their abutting ends, said sleeves having vertical channels therein, a plurality of panels or plates removably inserted between said upright members and having their vertical edges in the channels of the sleeves thereon; the plates between said upright members resting endwise one upon the other and having interfitting parts at their abutting ends, and means for holding said sleeves and plates from upward movement.

11. A receptacle of the character described having a marginal wall, comprising a base frame, a plurality of upright pipes laterally spaced apart and having their lower ends resting on said base frame, anchor plates secured to said base frame and provided with sockets to receive the lower ends of said pipes, a plurality of sleeves on each of said pipes and having interfitting parts at their abutting ends, said sleeves being provided with vertical channels, a plurality of panels or plates removably inserted between said pipes and having their vertical edges received in said channels of the sleeves thereon; the plates between said pipes resting one upon the other and having interfitting parts at their abutting ends, a channel member applied over the upper ends of said pipes and plates, and a tie rod extending vertically through each of said pipes and being connected at its upper end with said channel member and at its lower end with said base frame.

12. A receptacle of the character described having a marginal wall and a bottom wall, said walls comprising a plurality of removable panels or plates having their opposed ends connected together and with their lateral edges engaged with the parts interposed between the lateral edges of said plates.

13. A receptacle of the character described having an upright marginal wall and a hopper bottom extending downward from the base of said marginal wall, said marginal wall and said hopper bottom comprising a plurality of members provided with channels, and panels or plates removably inserted between said members and having their lateral edges in said channels thereof.

14. A receptacle of the character described having an upright marginal wall and a hopper bottom extending downward from the base of said marginal wall, said marginal wall and said hopper bottom comprising a plurality of pipes, a plurality of sleeves on each of said pipes and having longitudinally extending channels therein, and a plurality of plates removably inserted between said pipes and having their lateral edges in the channels of said sleeves.

15. A receptacle of the character described having an upright marginal wall and a hopper bottom, said marginal wall comprising a base frame, a plurality of upright pipes laterally spaced apart and having their lower ends resting on said base frame, a plurality of sleeves on each of said pipes with the lowermost sleeves resting on said base frame; the sleeves above said lowermost sleeve provided with vertical channels and said lowermost sleeve having a tubular extension inclined inwardly and downwardly and having channels therein extending longitudinally of said extension and registering with the channels in the sleeves thereabove, said hopper bottom comprising a plurality of pipes inclined downwardly and inwardly from said base frame and having their upper ends received in said tubular extensions, a plurality of sleeves on each of the pipes in said hopper bottom and having channels extending longitudinally thereof, and plates removably inserted between the pipes in the marginal wall and said hopper bottom and having their lateral edges in channels in the sleeves on said pipes.

16. A receptacle of the character described having an upright marginal wall and a hopper bottom, said marginal wall comprising a base frame, a plurality of upright pipes laterally spaced apart and having their lower ends resting on said base frame, a plurality of sleeves on each of said pipes with the lowermost sleeve resting on said base frame; the sleeves above said lowermost sleeve provided with vertical channels and said lowermost sleeve having a tubular extension inclined inwardly and downwardly and having channels therein extending longitudinally of said extension and registering with the channels in the sleeves thereabove, said hopper bottom comprising a plurality of pipes inclined downwardly and inwardly from said base frame and having their upper ends received in said tubular extensions, a plurality of sleeves on each of the pipes in said hopper bottom and having channels extending longitudinally thereof, and plates removably inserted between the pipes in the marginal wall and said hopper bottom and having their lateral ends in channels in the sleeves on said pipes, and a tongue and groove connection between the abutting ends of said plates and the lateral edges of said plates and the bottoms of the channels.

17. A receptacle of the character described having an upright marginal wall and a hopper bottom, said marginal wall comprising a base frame, a plurality of upright pipes laterally spaced apart and having their lower edges resting on said base frame, a plurality of sleeves on each of said pipes with the lowermost sleeve resting on said base frame, said lowermost sleeve having a tubular extension inclined inwardly and downwardly, said hopper bottom having a valve body at its lower end and provided with a discharge opening, a plurality of pipes inclined downwardly and inwardly from said base frame and having their lower ends engaged with said valve body and their upper ends received in said tubular extensions, a plurality of sleeves on each of the pipes in said hopper bottom, said sleeves in said hopper bottom and in said upright marginal walls being provided with channels extending longitudinally thereof, plates removably inserted between the pipes on said marginal wall and said hopper bottom and having their lateral edges in the channels in said sleeves on said pipes, a valve member for opening and closing said discharge opening, supporting posts connected with said base frame for elevating the receptacle above the surface of the ground, and means for connecting said valve body with said posts for having the weight thereof supported by said posts.

18. A wall comprising a base structure, a plurality of upright members extending above said base structure and supported thereby, and a plurality of panels or plates removably inserted between said upright members and having engagement therewith.

19. A receptacle of the character described having a marginal wall and a hopper bottom, said marginal wall comprising a base member, a plurality of upright members laterally spaced apart and supported by said base member, said hopper bottom comprising a plurality of inclined members extending downward from said upright members and having connection therewith, and panels or plates removably inserted between said upright and inclined members and having their lateral edges engaged with said members.

In testimony that we claim the foregoing as our invention, we affix our signatures in the presence of two witnesses, this 27th day of November, A. D. 1918.

HERMAN A. POPPENHUSEN.
ARTHUR P. STRONG.

Witnesses:
R. J. SMITH,
NANCY PETERSON.