A. A. KRAMER.

METAL BIN.

APPLICATION FILED JULY 19, 1915.

1,220,240.

Patented Mar. 27, 1917.

2 SHEETS—SHEET 1.

Fig. I

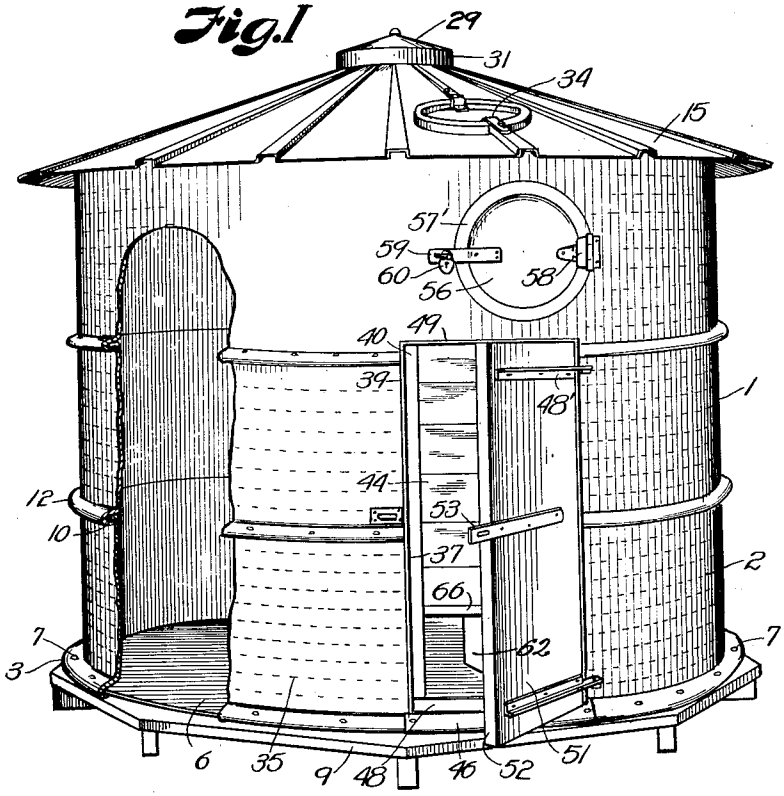


Fig. IV.

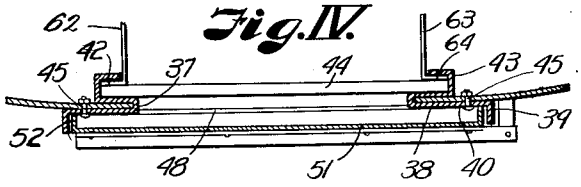


Fig. III.

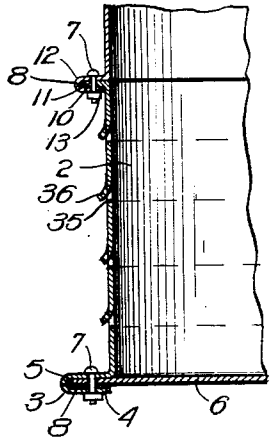
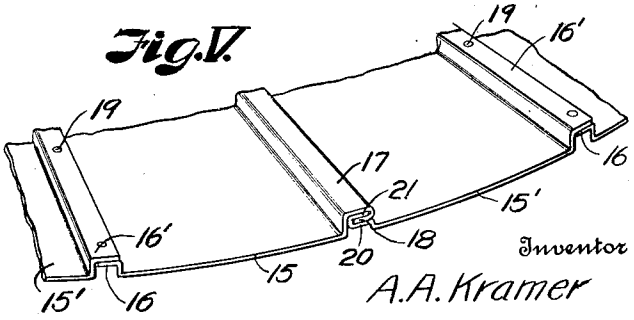


Fig. V.



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2 SHEETS—SHEET 2.

Fig. II.

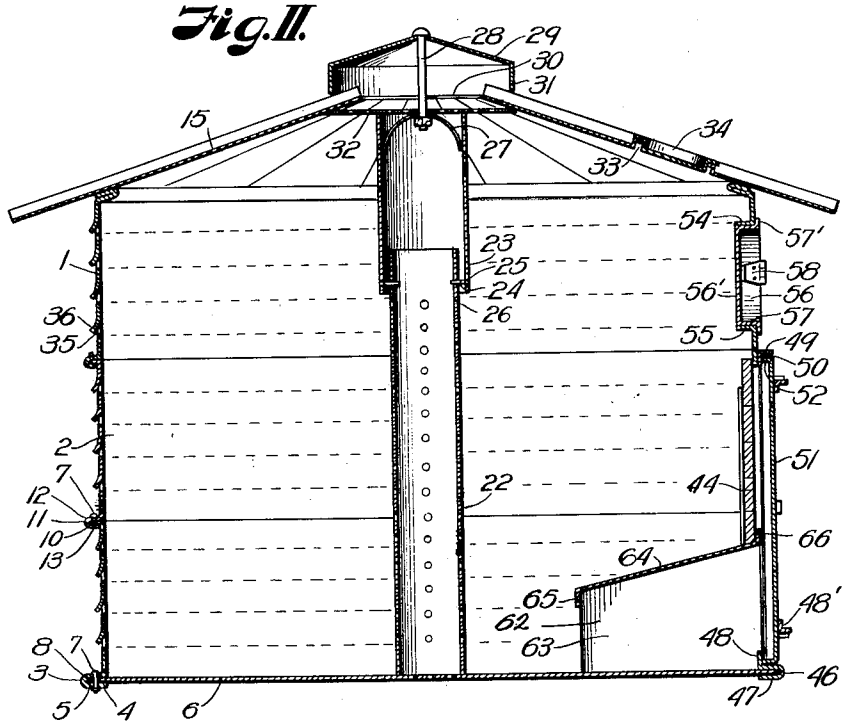


Fig. VI.

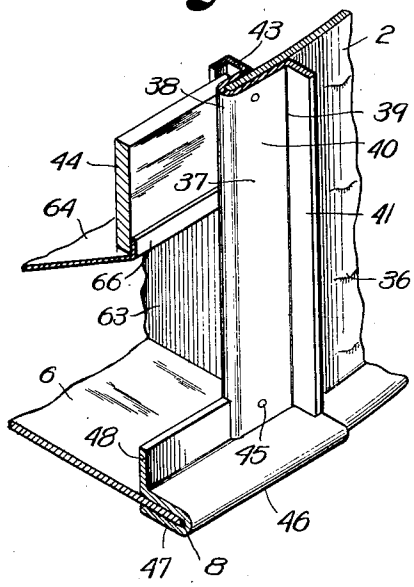
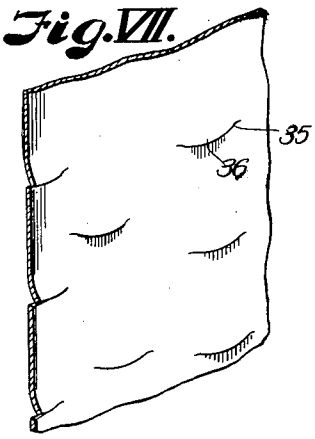


Fig. VII.



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UNITED STATES PATENT OFFICE.

ANDREW A. KRAMER, OF KANSAS CITY, MISSOURI.

METAL BIN.

1,220,240. Specification of Letters Patent. Patented Mar. 27, 1917.

Application filed July 19, 1915. Serial No. 40,614.

To all whom it may concern:

Be it known that I, ANDREW A. KRAMER, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Metal Bins; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon which form a part of this specification.

My invention relates to metal bins, and more particularly to bins for storing grain, or the like; the principal object of the invention being to provide a structure of this character wherein the joints, and particularly that between the side wall and floor, are effectually sealed to make them water tight, wherein ventilation is afforded through the side walls, and which includes other improved details of structure hereinafter described and illustrated in the accompanying drawings, wherein:—

Figure I is a perspective view of a grain bin containing my improvements, a part of the side wall being broken away for better illustration.

Fig. II is a central vertical section of the same; the section line running through both the main and filling doors.

Fig. III is an enlarged sectional view of the joint between the side wall and floor.

Fig. IV is a horizontal section through the main door.

Fig. V is a detail perspective of a part of the roof, particularly illustrating the joint between the roof sections.

Fig. VI is an enlarged detail perspective of a part of the main door frame, particularly illustrating the shoveling bin and its combination with the parts of the body of the structure.

Fig. VII is an enlarged detail view of a part of the side wall, illustrating the ventilator openings.

Referring more in detail to the drawings:—

1 designates the side wall of a bin containing my improvements, and which is preferably composed of strips 2 of sheet metal bent to the desired shape and superimposed to raise the bin to the desired height; the longitudinal edges of the horizontally arranged strips being sealed to each other to form a rigid, substantial structure and provide an air and water tight joint at the meeting edges; it being apparent that there may be as many horizontal strip sections or tiers as may be necessary to carry the bin to the desired height, and that the diameter of the bin may be varied to suit different requirements.

The lower edge of the bottom tier strip 2 is turned laterally and back to form a base flange 3 and anchor lip 4, with the lip spaced from the flange to provide a space 5 therebetween within which the edge of the floor 6 may nest, when the parts are assembled.

With a circular bin, the floor 6 comprises a circular piece of sheet metal of the desired thickness and of a diameter slightly greater than the diameter of the bin, but slightly less than that of the outer edge of the flange 3, so that the edge of the floor may project into the space between the flange and lip without interfering with the proper shaping of the side wall.

When the floor has been installed as described, it may be securely and permanently locked in place by bolts 7, which pass through the flange and lip and through the contained portion of the bottom 6; packing, indicated at 8, being preferably located within the nesting space to seal the floor and prevent damage to the contents of the bin from moisture passing up through the floor joint. The bin may be further protected from dampness from beneath by being supported on a platform 9 whereby it is raised from the ground sufficiently to allow for an air space therebeneath.

The upper edge of the bottom tier section of the bin has an outturned flange 10, which nests in a recess 11 formed between the outstanding flange 12 and backturned lip 13 on an upper tier section; the space containing packing, as in the floor joint, and the parts being also preferably connected by bolts 7 as in the lower joint. The successive tier sections are similarly joined to form a rigid and substantial structure; it being apparent that the number of sections used depends upon the height to which the bin is to be raised and on the width of the metal strips.

The top tier section has its upper edge turned inwardly instead of outwardly and lies at the roof angle, so that the roof, which will presently be described, may rest thereon and have bearing the width of the back-

turned flange; the flange being preferably doubled or back-lapped in order to stiffen it and form a more substantial seat for the roof.

The roof which I prefer to use with my structure is made up of mating, fan-shaped sections 15—15′, the former of which has one edge bent up and turned laterally to form a flange 16, and its other edge turned upwardly and outwardly to provide the flange 17, and back to form an underlying lip 18, which is spaced from the flange 17 to form a space for receiving a lap joint lip of an adjacent roof section. The section 15′ has an edge bent up and turned laterally to form a flange 16′ that overlies the flange 16 of the section 15 and is attached thereto by rivets 19, the opposite edge of the section 15′ being bent up and turned laterally and back to form the flange 20 and lip 21 for nesting in the flange 17 and lip 18 of the mating section to form the lap joint. No rivets are required for the lap joint, as the nesting of the parts provides the necessary attachment, the combination of the roof sections.

In order to provide ventilation within the bin, I provide a sweat tube comprising a lower cylinder 22, which is adapted to rest on the bottom of the bin and extends to near the top thereof, and which is perforated throughout its length so that air may enter the tube from the body of grain and carry off moisture therefrom.

Telescoping over the upper end of the cylinder 22 is an upper cylinder 23 that may be supported on the lower cylinder by pins 24 that extend through openings 25 in the upper cylinder into any of the perforations 26 in the lower cylinder to support the upper member at a desired elevation.

The upper cylinder is held in vertical position by spring arms 27 that are supported from a rod 28 that hangs from a canopy 29 which is supported on the roof and covers a ventilating opening 30 therein, the canopy having a base rim 31 bearing against the roof joints, so that air may circulate through the spaces between the said ribs. A perforated plate 32 is preferably mounted on the rod and held against the inner face of the roof by the spring arms.

The roof is also provided with a manhole 33 through which access may be had to the bin, and which is covered by a cap 34, when not in use.

In order to provide circulation through the bin when the door openings are closed, I preferably cut slits 35 in the metal sections of which the side wall is formed, and bend the metal outwardly above the slits to form the lips 36; it being apparent that by bending the metal in this way, rain flowing down the outer face of the bin will not pass through the slit into the bin, but will be dripped in front of the slits.

In order to provide access to the interior of the bin, I provide a door opening by cutting a vertical opening in the side wall, of sufficient height to admit a person therethrough. This opening is lined by door jambs 37, the preferred form of which may be described as a combination U, angle and channel iron, the U 38 facing outwardly and receiving the edge of the metal sheet to nest the same; the angle iron 39 being at the outside of the bin, so that one side 40, lies along the outer face of the metal strip and the other side 41, projects outwardly from the bin to form a seat for the door, which will presently be described. The channel iron 43 is at the inside of the bin and one of its sides lies along the inner face of the metal strip with the angle facing oppositely from the U in order that it may receive dropboards 44 that supplement the main door.

When the parts are arranged, the jamb may be permanently attached to the side wall strips by bolts 45 that project through the angle member 40 and through the metal strips that are contained within the U, so that the same bolt will anchor the jamb to the side wall.

In order to fill out the space at the bottom of the opening, which is left by cutting away the metal sections 2, I provide a combined U and angle member 46 which fits between the tier sections and comprises a U-member 47 that receives the edge of the floor as does the U-joint 3 on the lower tier section of the bin; the upper lap of the U being turned vertically at its inner edge to form the angle flange 48 that serves as a stop for the bottom of the bin door; the U-members 38 of the door jambs being cut away to seat on the angle 48 to form a snug fit of the parts.

The top of the door frame may consist merely of an angle iron 49, which may be secured to the tier section above the door opening and to the opposite jambs 37, forming a seat 50 at the top of the door opening for receiving the door.

The door 51 is suitably hinged to one of the jambs 37 and comprises a sheet metal body having inturned side and end flanges 52 adapted for projection into the seats at the top, bottom and sides of the door frame to effectually seal the opening, when the door is closed; the body being preferably reinforced transversely by anchor irons, or the like, 48′, and being provided with a lock-bar 53 whereby the door may be locked in any ordinary manner.

As the bin may be filled to a level above the top of the door, I provide a filling opening 54, which is formed by cutting out a circular opening in an upper tier section 2 and turning back a flange 55 from the metal to form a seat for the filling door 56.

The door 56 is preferably stamped from a single piece of sheet metal to provide a

saucer-like body wherein the base plate 56′ normally rests at the inner edge of the frame flange 55 and has a side ring 57 lying along said flange and provided with an outturned lip 57′ that lies along the side wall at the edge of the door opening. The door has a hinge 58 mounting the same on the side wall and has a lock-bar 59 whereby the door may be locked by a padlock 60.

This construction affords a natural and water-tight combination of the door with the bin as it is apparent that the eaves of the roof may overhang the top of the door to prevent moisture flowing between the door lip and side wall, but that should moisture get between the lip and wall, it will flow around the cupped body of the door and out at the bottom of the door opening of the outer surface of the bin.

As it is frequently desirable to remove the contents of the bin at intervals, as when the bin contains grain to be fed daily, it is necessary to provide some convenient means for providing access to the bin without permitting an excessive escape of the contents through the door opening. This provision is made by locating what I call a shoveling bin 62 on the floor of the bin immediately inside of the main door opening.

This shoveling bin comprises the sides 63, having laterally turned rails 64 at their forward ends adapted for travel in the channels 63 on the door jambs to guide the shoveling bin to and retain the same in place. The top of the bin 63 is preferably inclined so that grain resting thereon will slide therefrom when unrestrained, thereby providing against the grain packing on top of the shoveling bin; the inner edge of the top being preferably turned downwardly as at 65, to stiffen the structure, and the front edge of the top being turned upwardly to form a guide lip 66 for the slide boards 44.

When the bin is erected and is about to be filled, the shoveling bin may be located in the door opening and the boards 44 dropped to place one upon the other until the entire door opening is filled, the boards being filled in by a person within the main bin and who may pass out through the filling opening 54 when he has prepared the main bin for receiving grain.

Assuming that the parts are constructed as described, the tier sections, roof, floor and other parts of the bin may be shipped flat, or knock down, from the factory to be erected at the point of use. As the floor is flat and free from reinforcement or edge irons, it may be rolled into a compact space for shipping.

When the parts reach the point of erection, the floor is unrolled and flattened and the lower tier section applied thereto as heretofore described; the upper tier sections and roof being built up in turn.

The sweat tube is then erected by placing the lower cylinder on the floor of the bin and sliding the upper cylinder up until it is yieldingly held by the spring arms. The pins 24 may then be placed to securely hold the upper cylinder.

When the parts have been assembled, the door frame is fixed in place, the door mounted and the shoveling bin and slide boards properly placed. The bin is then ready for use.

The bin is filled through the upper opening and to any desired level irrespective of the main door, as the slide boards cross the main door opening except for the shoveling bin.

After the bin has been erected and filled, the grain may be withdrawn as required by opening the main door to expose the shoveling bin and removing the grain from the bottom of the bin through the shoveling member.

When the grain is lowered in the bin, the shoveling boards may be removed from the top and eventually the shoveling bin removed to provide easy access of persons to the bin.

The presence of the sweat tube allows surplus moisture to escape from the grain and keeps the latter in good condition.

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

In a bin the combination with a side wall, having a door opening, of a floor secured to the lower edge of the wall, a sill on said floor spanning the door opening and having an upwardly directed lip, forming a door stop, a U-member inclosing the edges of the wall at the side of the door opening and slit at its lower end to receive the sill stop, substantially as set forth.

In testimony whereof I affix my signature.

ANDREW A. KRAMER.