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2,288,809

COVER FOR GRAIN BINS AND THE LIKE

Filed July 29, 1940

2 Sheets-Sheet 1

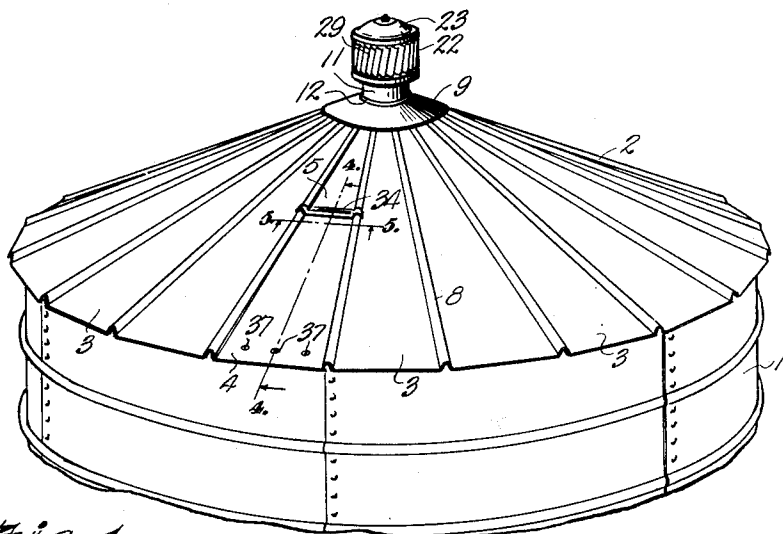


Fig. 1.

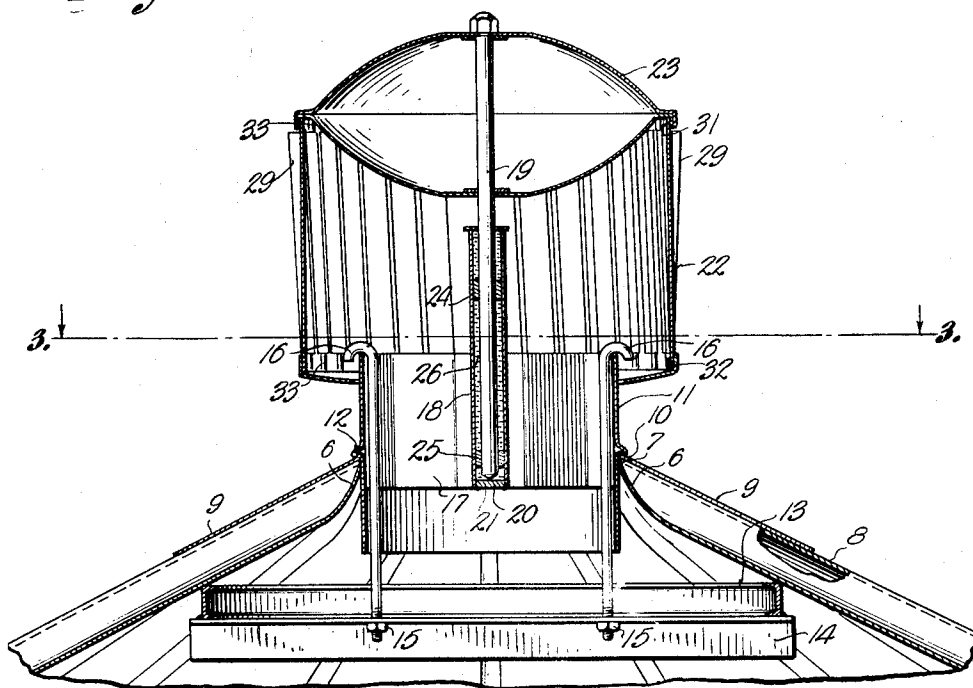


Fig. 2.

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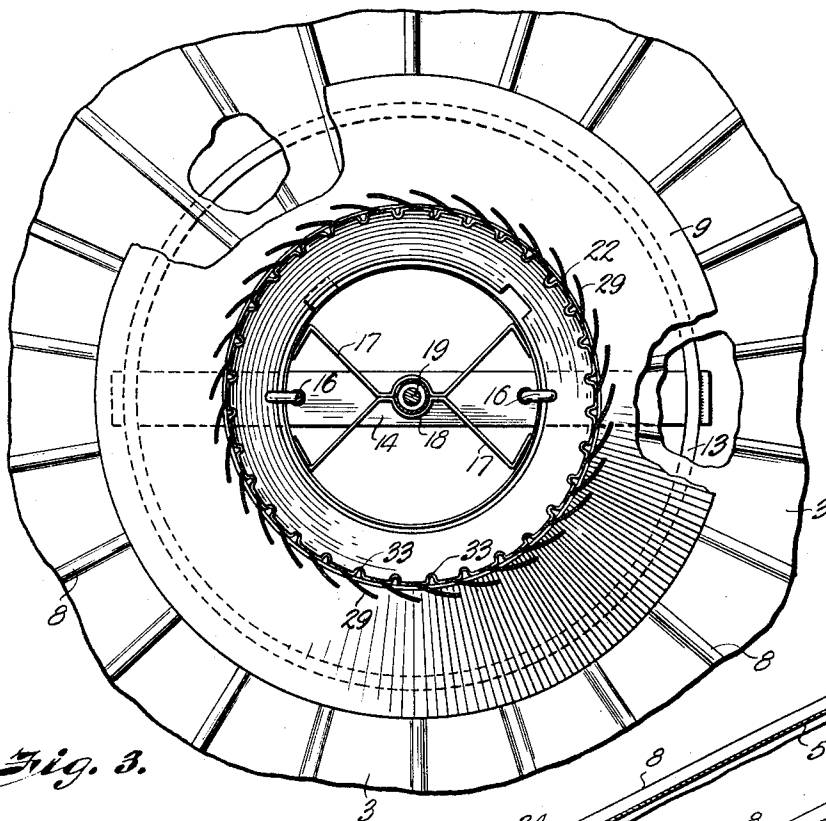


Fig. 3.

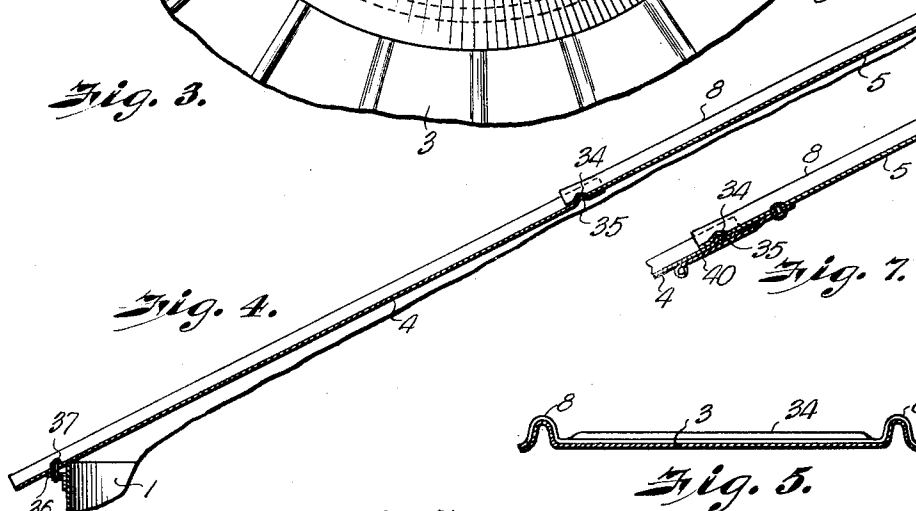


Fig. 4.

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE

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COVER FOR GRAIN BINS AND THE LIKE

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5 Claims. (Cl. 108—32)

Our invention relates to covers for grain bins and the like, and more particularly to a novel grain bin roof for the storage of wheat, corn and other grains.

Grain bins and similar structures must be weatherproof, adapted to keep out rain, snow and other moisture, and at the same time permit adequate ventilation and filling.

One object of our invention is to provide a grain bin having a novel roof and ventilator.

Another object of our invention is to provide a grain bin having a segmental roof and a novel manhole assembly.

Other and further objects of our invention will appear from the following description.

In the accompanying drawings which form part of the instant specification, and are to be read in conjunction therewith, and in which like reference numerals are used to indicate like parts in the various views;

Fig. 1 is a perspective view of a grain bin showing one embodiment of our invention.

Fig. 2 is an enlarged sectional elevation of our grain bin through the apex of the roof, showing the ventilator assembly.

Fig. 3 is a sectional view taken on the line 3—3, Fig. 2.

Fig. 4 is a sectional view taken on the line 4—4, Fig. 1, showing the manhole assembly.

Fig. 5 is a sectional view taken on the line 5—5, Fig. 1.

Fig. 6 is a plan view showing the method of making a portion of the ventilator.

Fig. 7 is a fragmentary sectional view similar to Fig. 4, showing a modification of the manhole structure.

More particularly, referring now to the drawings, the grain bin proper 1 may be of any suitable design of circular cross sectional shape. The roof 2 is formed of a plurality of segments 3, each identical in size and shape, with the exception of the manhole segment, which is formed of two portions 4 and 5 which together give an equivalent of a segment 3.

Each segment 3 is formed with a flat intermediate portion which is bent to form a pair of corrugations at each side. This can readily be seen by reference to Fig. 5. The corrugations are adapted to overlap and are secured to each other at the corrugated portions forming the roof shown in Fig. 1.

The flat intermediate portion between the corrugations at the point nearest the apex of the roof is bent upwardly so that the upper edge of each segment forms substantially a straight line.

The portion 6 bent upwardly can be seen by reference to Fig. 2, which is the section through the apex of the roof. It will be seen that the edge 7 between the end corrugations is substantially in a line passing through the top 8 of the corrugated portions of each segment.

In this manner the roof presents, when assembled, a ribbed or corrugated aspect. The upper inner periphery of the roof, however, terminates in a substantially continuous orifice, the corrugations having been eliminated by bending the intercorrugation metal to a line with the tops of the corrugations. There will be some slight buckling or crimping of the metal between corrugations, due to the forcing of the metal along a line of shorter effective length than theretofore existed.

A shield 9 of frusto-conical configuration is placed over the apex of the jointed segments. The inner periphery 10 of this shield, and the upper periphery of the roof contact substantially around the upper opening in the roof forming a snow-tight and moisture-tight joint.

A tubular member 11 provided with a collar 12 is then seated over the shield 9, as can readily be seen by reference to Fig. 2. The tubular member 11 forms the ventilator base while the shield 9 forms a skirt around the ventilator base 11.

A vent collar 13 is adapted to transmit the thrust of a bridge member 14 to the roof members proper. This thrust is exercised by means of nuts 15 acting through hook bolts 16. The arrangement is such that the ventilator base 11 is clamped to the vent and the collar 12 is forced against the vent skirt forming a tight joint.

Supporting straps 17 within the ventilator base 11 are adapted to support a bearing tube 18. A spindle 19 provided with a sharpened point 20, resting upon a bearing plate 21 in the bottom of the bearing tube 18, is adapted to support the rotary ventilator blade assembly 22, through the upper ventilator member 23. Bushings 24 and 25 center the ventilator spindle 19. The bearing tube 18 is adapted to be filled with oil 26.

The ventilator blade assembly is made of a single sheet in the manner shown in Fig. 6. The sheet 27 is first cut along the lines 28 to form blades 29, as shown by the right hand part of Fig. 6. The result is a plurality of blades 29 supported by side members 30 and 31. The dotted lines 32 show areas along the side members 30 and 31 where crimping will take place as shown by the left hand side of Fig. 6, to produce crimps 33. The crimping operation causes the blades

to overlap, as can readily be seen by reference to Fig. 3, in which the blades 29 overlap the openings from which they were formed, due to the crimps 30.

It will be noted that the upper member 23 of the ventilator assembly is greater in diameter than the vent opening. A straight rain, therefore, will be shed. When the wind is blowing, driving the rain, the ventilator blade assembly will spin, thus preventing rain from beating in through the vent.

A grain bin according to our construction has been tested for over a year, and it has been found that no rain or moisture can beat in through the grain bin roof ventilator.

The section 4 of the two-part segment forms a manhole through which grain is loaded into the grain bin. The upper section 5 is secured to adjacent segments 3 of the roof as are whole segments. The lower section 4 which forms the manhole is adapted to lap with the upper section 5, as can readily be seen by reference to Fig. 4. The upper section 5 is provided with a lateral corrugation 34. A corresponding corrugation 35 is formed upon the removable manhole section 4. A piece of angle iron 36 is secured adjacent the upper periphery of the grain bin proper so that the removable section 4 may be secured to the angle iron by bolts 37.

Referring now to Fig. 7, we have provided a segmental member 40 adapted to be secured to the upper section 5, additionally sealing the joint between the upper and lower sections of the manhole.

It will be seen that we have accomplished the objects of our invention. We have provided a grain bin having a novel roof assembly permitting the moisture-tight storage of grain while at the same time permitting the venting of the grain. A segment of the roof is formed in two sections, one of said sections being removable to provide a manhole. The vent is crowned with a ventilator which is secured to the roof in moisture and snow-tight relationship.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and sub-combinations. This is contemplated by and is within the scope of our claims. It is further obvious that various changes may be made in details within the scope of our claims without departing from the spirit of our invention. It is, therefore, to be understood that our invention is not to be limited to the specific details shown and described.

Having thus described our invention, we claim:

1. A sectional steel cover formed with a plurality of segments, each of said segments having a flat intermediate portion and corrugated side

portions, said corrugated side portions adapted to nest upon each other to form a completed cover, one of said segments being formed in two parts, namely, an upper part and a lower part, and means for nesting said upper and lower parts to form the equivalent of a segment, the upper portions of each of said segments being shaped to form a sleeve which defines a vent opening, said sleeve having substantially a planar peripheral edge.

2. A sectional steel cover formed with a plurality of segments, each of said segments having a flat intermediate portion and corrugated side portions, said corrugated side portions adapted to nest upon each other to form a completed cover, one of said segments being formed in two parts, namely, an upper part and a lower part, means for nesting said upper and lower parts to form the equivalent of a segment, the upper portions of each of said segments being shaped to form a sleeve which defines a vent opening, said sleeve having substantially a planar peripheral edge, a skirt surrounding said vent opening and resting upon the peripheral edge of the sleeve, a cylindrical ventilator base formed with a collar seated in said vent opening, means for holding said ventilator base in said vent opening to seat the collar firmly against the skirt, and a ventilator supported by said ventilator base.

3. A cover as in claim 2 in which said ventilator comprises a spindle, a bearing supported by said ventilator base, a blade assembly carried by said spindle, and means for rotatably mounting said spindle in said bearing.

4. A cover as in claim 2, in which said means for securing said ventilator base in said vent comprises a bridge member under said ventilator base, and hook bolts between said bridge member and the upper periphery of said ventilator base.

5. A sectional steel cover formed with a plurality of segments, each of said segments having a flat intermediate portion and corrugated side portions, said corrugated side portions adapted to nest upon each other to form a completed cover, one of said segments being formed in two parts, namely, an upper part and a lower part, said lower part adapted to serve as a removable manhole cover, and means for lapping said upper and lower parts to form the equivalent of a segment, the upper end portions of each of said segments being flanged upwardly between the corrugated side portions to present an unbroken continuous edge defining a vent opening.

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