G. S. DUFFIN.

SILO ROOF CONSTRUCTION.

APPLICATION FILED OCT. 9, 1913.

1,161,115.

Patented Nov. 23, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

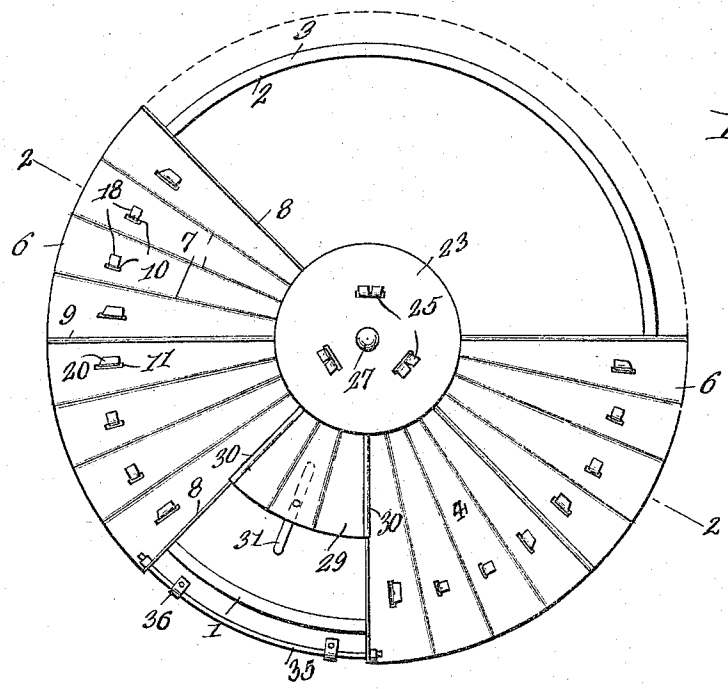
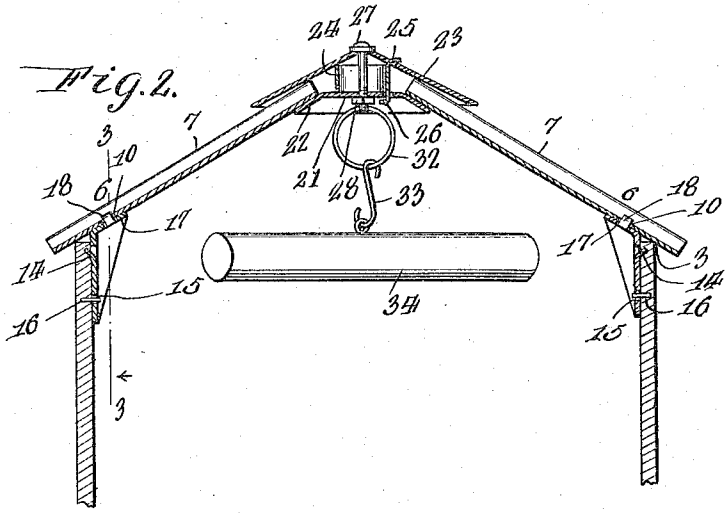


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

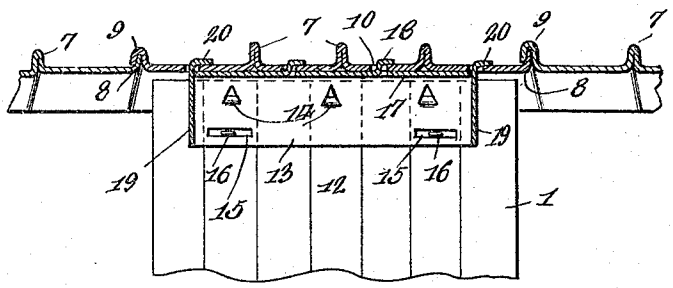


Fig. 4.

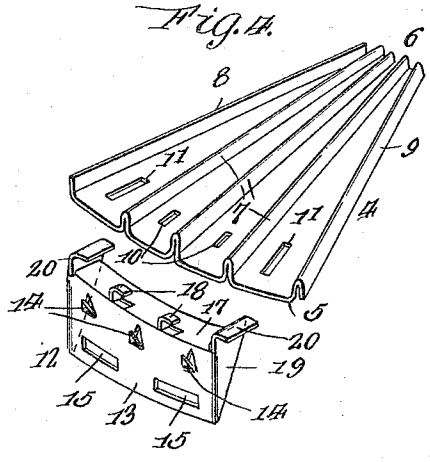


Fig. 5.

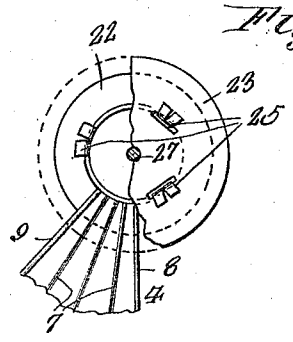
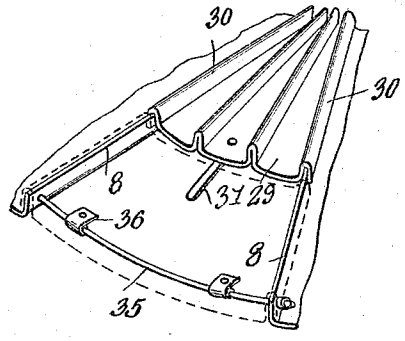


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE S. DUFFIN, OF HOOPESTON, ILLINOIS.

SILO-ROOF CONSTRUCTION.

1,161,115. Specification of Letters Patent. Patented Nov. 23, 1915.

Application filed October 9, 1913. Serial No. 794,245.

To all whom it may concern:

Be it known that I, GEORGE S. DUFFIN, a citizen of the United States, residing at Hoopeston, in the county of Vermilion and State of Illinois, have invented certain new and useful Improvements in Silo-Roof Construction, of which the following is a specification.

This invention relates to improvements in silo roof constructions of that class wherein interlocking metal roof sections of radially converging form are provided to extend from the silo wall to a center connecting structure.

The novel feature of this invention consists in the mounting of the roof sections on the silo wall, at the outer ends of said sections, and the provision of an improved form of center structure for connection with the inner ends of the roof sections.

The roof sections are connected at their outer ends with the silo wall at any desired inclination and are not only held in position by their wall supports but they are also locked against their upward and downward movement, and a further feature consists in centrally weighting the roof against upward movement under wind pressure.

An object of the center connecting structure is to connect the inner reduced ends of the roof sections in an effective water-shedding manner and so as to effectively engage the same above and below to render the roof structure as rigid as possible.

Other objects and features of the invention will be more fully described in connection with the accompanying drawings, and will be more particularly pointed out in and by the appended claims.

In the drawings: Figure 1 is a plan view of a silo roof construction embodying one form of my invention. Fig. 2 is a sectional view on line 2—2 of Fig. 1. Fig. 3 is a sectional view on line 3—3 of Fig. 2 looking in the direction of the arrow. Fig. 4 is a perspective view of one roof section and an improved wall bracket support therefor, with the bracket shown detached from its section. Fig. 5 is a plan view of the center connecting structure with parts broken away for clearness of illustration. Fig. 6 is a plan view of a portion of the roof section adjacent that portion thereof provided with a door opening.

Like characters of reference designate similar parts throughout the different figures of the drawings.

In the embodiment shown, 1 designates a silo wall of cylindrical form having a flat top 2, the outer corner 3 thereof forming a roof supporting portion, as will hereinafter more fully appear. The roof shown is composed of sheet metal and is made up of a plurality of sections similar to that shown in Fig. 4, and which is designated as a whole at 4. The section 4 converges from its outer end 5 to its inner end 6 and the body portion is bent to form longitudinally disposed radiating ribs 7 which are disposed in suitable spaced relation and which converge or radiate from the center of the roof as will be seen by reference to Fig. 1. One side margin, designated at 8, is turned upwardly to form a longitudinal male locking member and the remaining side 9, is turned upwardly and then downwardly upon itself to form a female locking member. The sections will be so disposed in making up the roof as to provide for interlocking the male member of one section with the female member of the next adjacent section and it will be seen that when the sections are locked the female member will present the general appearance of one of the ribs 7 so as not to break the continuity of appearance. Near their outer ends, the sections are provided with inner locking or fastening openings 10 and outer openings 11, with respect to the sides of the sections, the disposition of the sections longitudinally, with respect to the silo wall 1, being such as to dispose said openings inwardly of the wall, as will be seen by reference to Fig. 2.

The supporting means for the roof sections comprise brackets, designated as a whole at 12. Referring more particularly to Fig. 4, it will be seen that the bracket comprises a side wall 13, which is curved to conform to the curvature of the silo wall 1, so as to lie in abutting relation against the inner face thereof. Prongs 14 are struck up from the wall 13 so as to dispose their points upwardly. Near its lower margin, the wall 13 is provided with elongated openings 15, adapted to receive supporting projections 16 adapted to be driven into the wall 1, the elongations of the openings 15 provide for relative movement to the locking elements 16 upon shrinkage of the wall

1. It will be seen that when the prongs 14 are driven into the wall 1, they will serve effectively to lock the bracket against any upward movement from its position of anchorage with the wall 1. The locking elements 16 will serve to lock the bracket either against upward or downward movement from its position of anchorage. The upper margin 17 of the bracket is bent from the vertical to an angle such as it is desired to have the roof sections assume, whereby the roof sections will lie in flat abutting relation with the upper angularly disposed supporting wall, as will be seen by reference to Fig. 2. In the supporting wall 17 of the bracket are struck up from the body one or more fastening lugs 18, adapted to be projected through the openings 10 and subsequently bent over as shown in Fig. 3 upon the top face of the roof section. The end margins of the bracket are bent inwardly, as indicated at 19, to form vertically disposed end bracket brace walls which are preferably inclined from their wider upper ends so as to merge into the side wall 13. The end walls 19 extend upwardly above the top supporting wall 17 to form fastening projections 20 adapted to project through openings 11 and be turned downwardly as shown in Fig. 3 upon the top face of the roof section.

It will be seen by reference to Fig. 2 that the lower face of the roof section will be disposed at an angle with respect to the horizontal top 2 of the wall 1, and that the sections will lie in supporting relation with the outer supporting margin 3 of the wall 1. It will thus be seen that the roof sections have a relatively extensive abutting support upon the wall 17 on which they are locked, and at spaced relation with respect to the wall 1, the roof sections being supported on the wall 1, of the silo thereby most effectively serving to anchor the roof sections in position.

Referring to the center connecting structure with which the inner ends of the roof sections are connected, 21 designates a base for the center structure having a central horizontally disposed portion and a downwardly inclined margin 22.

23 designates a center cap which is preferably cone-shaped and the wall of which is disposed at an angle somewhat less than the angle of the flange 22 so as to freely permit insertion of the ends of the roof sections between the cap and base providing the roof section with enough play to be lifted over the silo wall 1, in cases where the roof sections are fastened at their outer ends last. Thus it will be seen that the roof sections are engaged at their inner ends by upper and lower center members which diverge outwardly, one of the center members, which in the present construction is the lower center member, lying in supporting parallel relation with the lower faces of the inner ends of the roof sections. Between the cap and base 23 and 21, respectively, I dispose a spacing member 24 which may be tubular in form and which is provided with locking extensions 25 and 26 adapted to be projected through openings in the cap and base and bent into locking relation therewith, as will be clearly seen by reference to Fig. 2. The tubular member will hold the center structure, consisting of the cap and base, in assembled relation but in order to snugly engage the parts with each other, I provide means which may be in the form of a bolt 27 having a nut 28 whereby the cap and base may be securely fastened to prevent rattling of the roof structure under the action of a heavy wind.

I advantageously provide means for weighting the central structure to prevent raising off of the roof at the center under a heavy wind action. As shown, I have attached a ring 32 to the bolt 27 and provide an S-hook 33 whereon a suitable weight 34 may be pendantly hung. The weight 34 may consist of wire netting used for surplus ensilage or take the form of any other weight. It will be readily seen that by the imposition of a weight on the center structure, the same will not only be locked more firmly thereat, and also on the silo wall bracket, but the whole structure will be provided with means normally resisting any tendency of the wind to lift the roof off from the silo.

In order to provide for a trap or like door opening in the roof structure, a special roof section 29 is provided which extends outwardly from the center structure toward the wall 1, but not over the same. The margins of the roof sections adjacent the roof opening, are both bent upwardly to provide male locking portions 8, and the partial section 29 is provided on both sides with female locking portions 30. A hinge rod 35 may be secured to the flanges 8, as shown in Fig. 6, on which a trap door indicated by dotted lines may be hinged, by means of hinges 36. In order to limit movement of the swinging door inwardly, I may provide a swinging stop 31 on the section 29, as shown.

While I have herein shown and described one specific form of my invention, I do not wish to be limited thereto, except for such limitations as the claims may import.

I claim:—

1. In a silo, a wall having a horizontal top, an inclined roof comprising roof sections having outer ends overhanging said wall and engaging the outer corner or edge thereof and provided with fastening openings, bracket supports for said wall sections having prongs struck up therefrom for insertion into the inner face of the silo wall

to lock the bracket supports thereagainst from any upward movement, said bracket supports having openings and the silo wall having projections loosely engaging said openings to compensate for shrinkage and to lock the bracket supports against either up or down movement, and fastening projections on said bracket supports extended through the openings in said roof sections and being bent into locking engagement with said sections to lock said sections in supporting relation with respect to said supporting brackets and the silo wall.

2. In a silo, a wall, an inclined roof section having its outer end overhanging said wall and supported thereby, a bracket support having a side wall secured to the inner face of the silo wall and having its upper margin inclined to abut and support said roof sections and provided with fastening means for locking the roof section upon said inclined supporting wall, the end margins of the bracket side wall being bent inwardly to form brace walls and being projected upwardly in locked relation with said roof section thereby locking the latter upon said bracket support and said silo wall.

3. In a silo, a wall, an inclined roof comprising a plurality of sections extending radially inwardly and centrally of the wall, a center structure for the inner ends of said sections comprising a base having a horizontal center portion and a downwardly inclined angular flange engaging the lower faces of the inclined sections, a vertically disposed tubular spacing member on said base, a conical cap having its wall inclined less than the angle of inclination of said sections and overlapping the inner ends of said sections, said cap and base having openings and said spacing member having fastening projections for engagement with said cap and base through said base and cap openings for locking the parts of the center structure in rigid engagement with respect to each other.

4. In a silo, a wall, an inclined roof comprising a plurality of sections overhanging the wall and extending radially inwardly therefrom, a center structure comprising a base and cap for embracing the lower and upper faces of the inner ends of the roof sections, respectively, a spacing member disposed between said base and cap and in locked relation therewith, and means for tightening the cap and base in rigid engagement against said spacing member, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE S. DUFFIN.

Witnesses:
J. H. JONES,
CECIL YOUNG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."