C. H. SHAVER.

SILO.

APPLICATION FILED JULY 1, 1916.

1,234,941. Patented July 31, 1917.

Fig 1

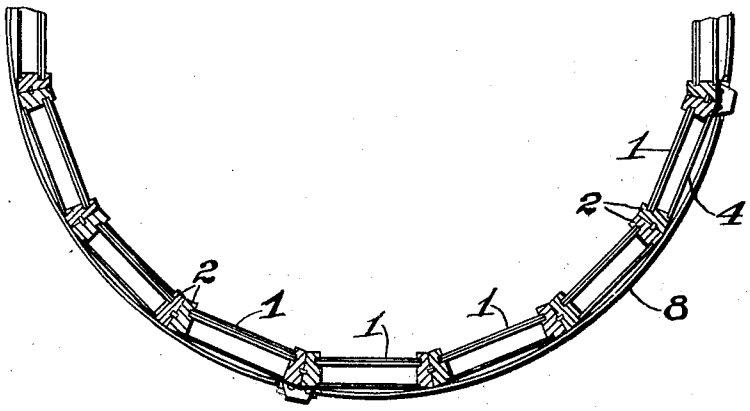


Fig 2

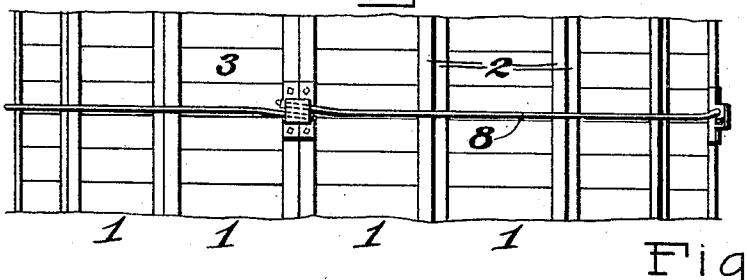


Fig 3

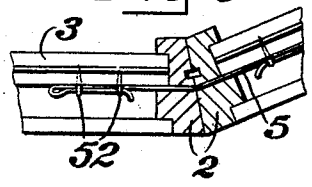


Fig 4
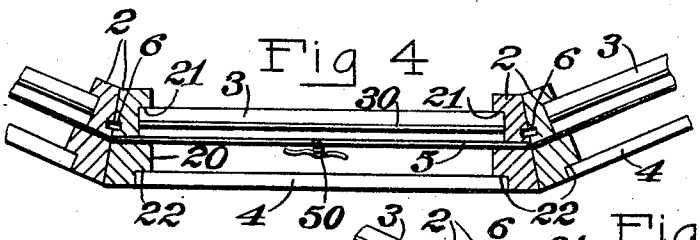


Fig 5

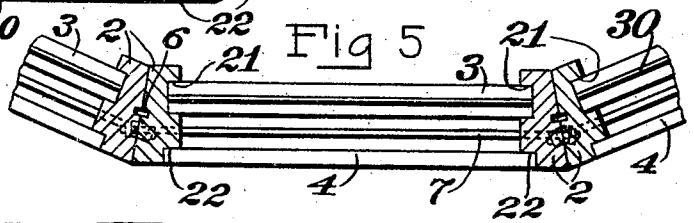
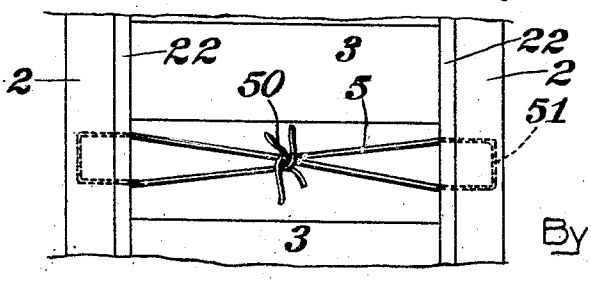


Fig 6



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SILO.

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Application filed July 1, 1916. Serial No. 107,118.

To all whom it may concern:

Be it known that I, CHARLES H. SHAVER, a citizen of the United States, and resident of Bellingham, Whatcom county, State of Washington, have invented certain new and useful Improvements in Silos, of which the following is a specification.

My invention relates to silos and other like tank structures in which a type of construction is employed wherein the walls of the silo are made in unitary sections, which sections may be completed at the mill and shipped in this form, the erection of the silo involving only the assembling of these unitary sections.

One object of my invention is to do as much of the work of construction at the mill as is possible, and to make the sections of the silo of such sizes that they may be conveniently handled without special equipment therefor.

It is a further object of my invention to produce a type of structure in which the making and assembling of the parts of which it is composed, shall be of such character as to contribute to the cheapness of manufacture and also of a type of construction which shall have superior qualities as well as cheapness in cost.

The preferred type of construction will be shown in the accompanying drawings and then described in the specification, while the special features of which my invention consists, will be specifically set forth in the claims terminating the specification.

Figure 1 is a sectional plan of a part of a silo.

Fig. 2 is a side elevation of a short section of the silo.

Fig. 3 is a cross section showing in detail one form of assembling the parts of the silo.

Figs. 4 and 5 are sectional plans showing different manners of securing the parts of the section together.

Fig. 6 is a face view of a part of a silo section showing one manner of securing together the post members.

A silo constructed in accordance with my invention would be of polygonal outline and would have each face of the polygon composed of a unitary section, which section would be completely assembled at the mill. Each of these sections employs two bars or beams constituting post members 2, which post members form the edge faces of the section. These post members are connected by wall boards which extend between them and are secured in place by suitable means.

Each post member is of trapezoidal outline and has the face which is inward of the section, that is, the face which is opposed to the opposite post member, provided with a groove 21, adjacent to that edge of the post which is at the inside face of the section. This groove is preferably rectangular in outline, with the sides thereof perpendicular to the face of the post. Placed in these grooves are the inner wall boards 3, these boards being preferably provided with interlocking tongue-and-groove 30, so as to make a tight fit. These inner wall boards extend to the extreme ends of the post members 2.

These boards are not intended to be nailed in place, but are preferably free to move under the swelling effects of moisture. If nails are used it will be only to temporarily secure them, prior to erection, but it is preferred to rely upon other means which will be hereinafter described.

Outer wall boards 4 are preferably employed, these forming a skin to protect the other boards from the weather and also to provide a dead air space to thereby prevent freezing. The preferred manner of applying these boards is as follows: The outer corners of the posts 2, at the side which faces toward the center of the section, is rabbeted, as shown at 22, and the outer wall boards 4 have their ends seated in this rabbet. These outer wall boards are intended to be nailed to the post. They form the principal means for holding the section together until the silo is assembled.

In order to securely hold the inner wall boards 3 against movement in the grooves 21, I provide means whereby the inner edges of the posts 2 may be drawn together so as to clamp the end faces of the wall boards. In Figs. 4 and 6 means for accomplishing this purpose is shown. This means consists of heavy wires 5 which are bent into the form of a loop and have their ends passed, from the outside inward, through holes formed in the post boards. The ends of the wires passing through opposite posts, are then gathered together and twisted, or otherwise secured so as to exert an inward pull upon the two post members.

In Fig. 3, another plan is shown, in which the ends of the wire loops are secured by staples 52, driven into the inner wall boards 3. In Fig. 5 another means is shown consist-

ing of bolts 7 which pass through the posts, these serving as additional holding means until erection, being removed when the silo is set up. Prior to erection the outer wall boards 4 form thrust or compression members and the securing bolts or wires form tie members, these acting together to clamp the ends of the inner wall boards 3.

In the wire tie rods, such as shown in Figs. 3, 4 and 6, the outer looped end 51, may be easily forced into the body of the wood in such way that it will not interfere with the tightness of the joint between adjacent sections.

The faces of the posts 2, which contact with the posts of the adjacent sections, are each provided with a longitudinal groove 6, into which is placed a strip of wood which serves both as a packing to secure tightness of the joints between the sections and as a dowel to hold them in proper registry. These faces are inclined relative to the opposite face, so that they lie in radial planes of the complete silo.

After setting up the silo, hoops 8 are placed about the same. These hoops may be of any number and in construction whatever is found desirable.

By constructing the sections of the silo in this manner, the silo sections may be completely assembled at the mill, where the necessary means for doing this work cheaply and well may be easily provided. The size of these sections may be kept within limits such that they may be conveniently handled and erected. Preferably their length is the height of the silo. The posts 2 are the only members which require first class lumber, or pieces of any length.

The wall boards 3 and 4 are all short and may be cut from poorer grades of lumber and from trimmings, and therefore, their cost is much less than that of clear lumber. In consequence, the cost of manufacturing such a silo is much less than that of the stave type of silo, in which practically all the lumber must be of especially good quality. Moreover, a silo which is made of sections of this type is much more quickly, cheaply and easily set up, than a stave silo, with practical results equally good and, in some respects, better.

What I claim as my invention is:

1. A unitary wall section adapted to form one face of a polygonal silo, comprising two posts forming the longitudinal edge members thereof and disposed with their inner or opposed faces parallel and each provided with a longitudinal groove extending throughout its length, wall boards having their ends in said grooves, the faces of said posts which form the edge faces of the sections being inclined to each other to lie in radial planes of the completed silo and exposed to contact with like faces of adjacent sections, said faces having each a longitudinal groove adapted to receive a packing strip when the sections are assembled to form a silo.

2. A unitary wall section adapted to form one face of a polygonal silo, comprising two posts forming the longitudinal edge members thereof and disposed with their inner or opposed faces parallel and each provided with a longitudinal groove extending throughout its length, wall boards having their ends in said grooves, the faces of said posts which form the edge faces of the sections being inclined to each other to lie in radial planes of the completed silo and exposed to contact with like faces of adjacent sections, and means for holding said posts against separation before erection.

3. A silo of polygonal outline having each side composed of a unitary section, each section comprising posts extending along its edges, means for securing said posts together in spaced relation, horizontally extending boards forming an inner skin, the posts having grooves extending throughout their length and receiving the ends of said boards, the faces of the posts forming the outer edges of the sections being beveled to conform to radial planes of the completed silo and having longitudinally extending grooves therein, and packing strips fitting said grooves.

4. A silo stud of a trapezoidal section having two right angles, one of the two non-parallel sides having a longitudinal groove adjacent one side edge thereof and rabbeted along its other edge said groove and rabbet being adapted for the reception of wall boards.

5. A silo stud of trapezoidal section having two right angles, one of the non-parallel opposite sides having a groove for the reception of wall boards and the other a groove for the reception of a sealing strip.

6. A polygonal silo structure composed of vertical sections each composed of two trapezoidal side bars having their opposed faces provided each with a groove and wall boards having their ends in said grooves, said side bars having their opposite or outwardly facing surfaces each provided with a groove for the reception of a dowel or sealing strip.

Signed at Minneapolis, Minnesota, this 24th day of June, 1916.

CHARLES H. SHAVER.

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