

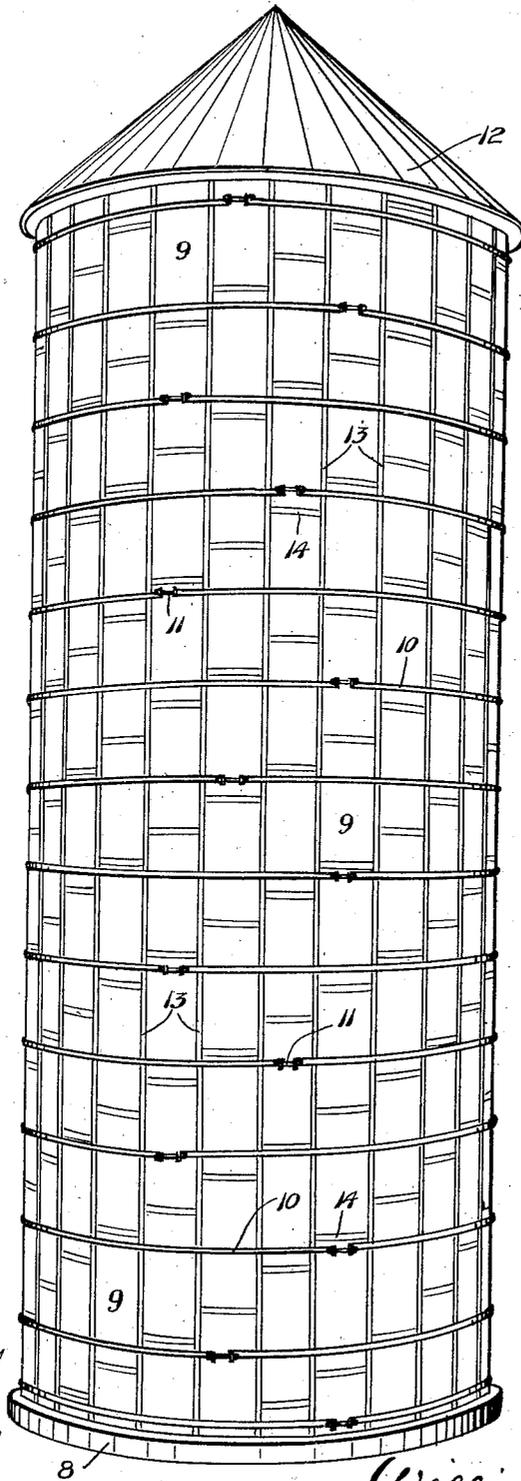
H. F. STEINKRAUS.  
MASONRY SILO.  
APPLICATION FILED FEB. 11, 1918.

1,383,166.

Patented June 28, 1921.

2 SHEETS—SHEET 1.

*Fig. 1.*



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2 SHEETS—SHEET 2.

Fig. 2.

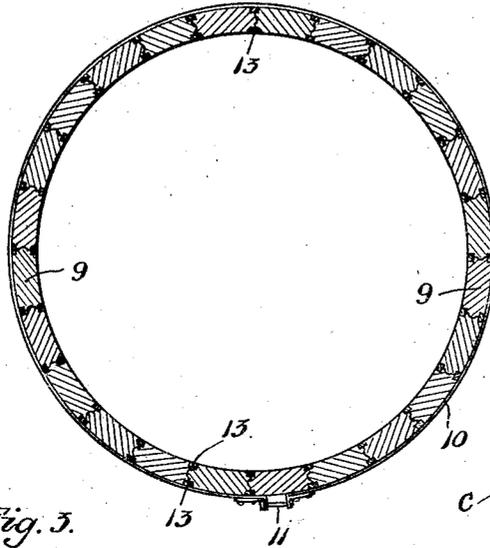


Fig. 5.

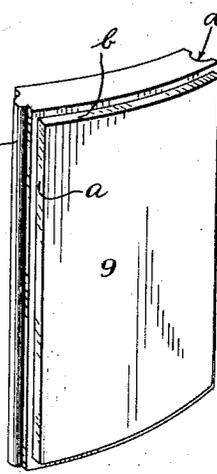


Fig. 3.

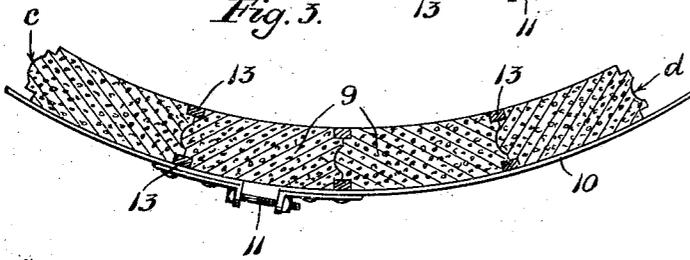


Fig. 4.

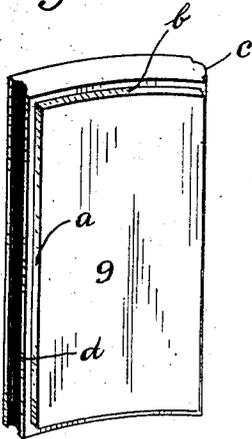


Fig. 7.

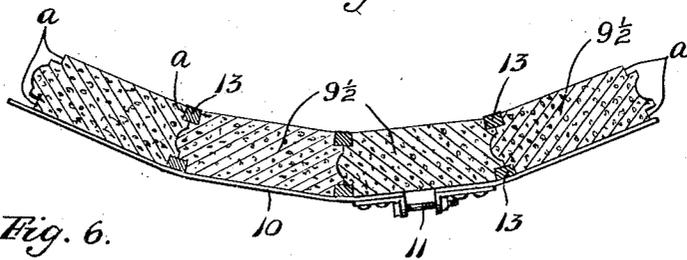
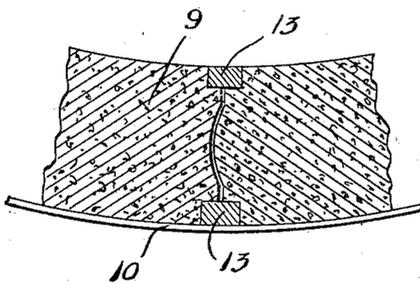


Fig. 6.



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# UNITED STATES PATENT OFFICE.

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## MASONRY SILO.

1,383,166.

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Application filed February 11, 1918. Serial No. 216,474.

*To all whom it may concern:*

Be it known that I, HENRY F. STEINKRAUS, a citizen of the United States, residing at Bertha, in the county of Todd and State of Minnesota, have invented certain new and useful Improvements in Masonry Silos; and I do hereby 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.

My invention has for its object to provide a masonry silo of improved construction; and, to this end, my invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

My invention is illustrated in the accompanying drawings, wherein like notations refer to like parts throughout the several views.

In said drawings,

Figure 1 is a perspective view illustrating a silo embodying my invention;

Fig. 2 is a horizontal cross section of the silo shown in Fig. 1, but on a reduced scale;

Fig. 3 is a detail showing some of the same parts appearing in Fig. 2, but on a larger scale;

Figs. 4 and 5 are perspective views of one of the masonry slabs, of the kind shown in Figs. 1, 2 and 3, detached, and Fig. 4 being an inside view and Fig. 5 being an outside view, with reference to the positions they occupy, when assembled in the silo wall.

Fig. 6 is a further detail showing some of the same parts appearing in Fig. 3, but on a still larger scale and as they would appear before the hoops were drawn together, at their open ends, into their final position; and

Fig. 7 is a view similar to Fig. 3, but illustrating a slightly modified form of the masonry slab, to wit: a form wherein the slabs are straight on both their inner and outer faces, instead of curved, as shown in the other views.

Referring now to Fig. 1 of the drawings, the numeral 8 represents a concrete, or other suitable foundation or base, upon which is rested the silo walls made up of the masonry slabs 9; the numeral 10 represents the split or open ended draw hoops provided with the customary draw bolt 11, seated in the flanged ends of the hoop and adapted to

draw the same together, when in proper working position. The numeral 12 represents a roof of any suitable structure, applied in any suitable or customary way to cover and close the top of the silo. Of course, in practice, the silo is also provided with suitable doors, not here shown.

The masonry slabs 9 are preferably composed of concrete, but may be made of the same material as brick or tiling; and I prefer to mold the same, so that they will have curved inner and outer faces, as illustrated in all the views, except Fig. 7; for the reason that I can thereby get a silo wall formed on a true circle, or substantially true circle, throughout all the parts, by setting the arcs of the inner faces of the slabs, as shown in the drawings. (Figs. 1, 2, 3 and 6.) I may, however, make the said masonry slabs with parallel straight inner and outer faces, and then set the same, relative to each other, on the chords of comparatively short arcs, so as to thereby get a polyhedral wall, which is approximately circular, as illustrated in Fig. 7, the slabs there shown being marked with the reference 9 $\frac{1}{2}$ .

The masonry slabs 9 are all rabbeted on both their outer and their inner vertical adjoining edges to afford seats "a" for packing means, which packing means is preferably in the form of strips of wood, or other slightly compressible heat insulating material 13, of rectangular form in cross section, adapted to rest in the seats 8, and thereby pack the vertical joints "a" as clearly shown in Figs. 2, 3, 6 and 7. The masonry slabs 9 may also be rabbeted on their outer adjoining horizontal edges, to afford seats "b" for similar packing material 14, as shown applied in Fig. 1.

The seating edges of the slabs 9 and 9 $\frac{1}{2}$  are straight in cross section, at the upper and lower ends of the slabs, but their vertical seating edges are convex, at one side, and concave at the other, the convex or tenon surface being marked with the reference letter "c" and the concave surface or groove with the reference letter "d" in the detached views, Figs. 4 and 5. Of course, the concave surface or groove "d" of one slab is adapted to receive the convex surface or tenon "c" of the adjacent slab. These details may be varied, at will.

Having regard to the relative positions of the slabs in the respective courses, I prefer to employ slabs of unequal length for the starting courses and have enough different lengths, so that I can position the slabs of the successive courses, so that they will break joints and no horizontal joints will be in the same plane at intervals of less than four slabs apart, as clearly shown in Fig. 1. This, of course, affords a strong wall. The slabs are all of equal section measured in the plane of an arc of the silo, or on the radius thereof, and are so set that their vertical rabbeted surfaces aline with each other, so as thereby to afford continuous seats "a" for the packing strips 13. The packing strips 13 may, therefore, be of a length equal to the height of the silo, or they may be made of shorter lengths and placed, one above the other to fill the seats and pack the joints to the full height of the silo. The slabs may, of course, be set in cement in the customary way, and, after the packing strips 13 have been placed in their seats, the draw hoops 10 are applied and will, of course, embrace the outer surfaces of the slabs and the outer faces of the outer packing strips. Then when the draw bolts 11 are manipulated so as to tighten the hoops, the walls will be slightly contracted in the arc of the circle and this will have the effect of making the vertical walls of the inner seats "a" pinch the vertical faces of the strips 13 seated therein, and thus secure the said strips in their desired working position. This slight change in the position of the slabs can be readily understood by a comparison of the parts shown in Fig. 6 with the parts shown in Figs. 3 or 7. In Fig. 6, the parts are shown as they would appear, before the ends of the draw hoop have been drawn tightly together, whereas, in Figs. 3 and 7, the parts are shown as they would appear after the hoop has been tightened up.

In respect to the horizontal packing strips 14, shown in working position in Fig. 1, they are applied to the seats "b" afforded by the rabbeted surfaces on the outside faces of the slabs, at the ends thereof, as the slabs are placed in position to build up the wall and reliance is placed upon the weight of the slabs, or the thin coating of cement at the slab joints to hold the horizontal strips 14 in their working positions. When wood is employed as the material for the packing strips 13 and 14, and they are intended to remain in permanent use, I prefer to creosote the strips.

A masonry silo, constructed as above described, has certain obvious advantages. It is well known that where masonry silos are used in sections of the country subject to extreme changes of temperature, like the far Northwest, ranging from many degrees above to many degrees below zero, the con-

crete foundation is liable to heave and settle, under the action of the frost and the thaw-out, and if the concrete blocks of the silo walls are united solely by cementitious materials, the change in the foundation, or the heaving and the settling of the walls will crack the cementitious materials and open the joints between the blocks, or sometimes even crack the blocks themselves. By constructing the slabs with the rabbeted seats for the packing strips and employing the packing strips therein, as above described, I am able to secure air-tight joints, which will maintain their air-tight condition, under all conditions of the weather, no difference how great the change in temperatures from points above to points below zero. Otherwise stated, if there is any heaving or settling of the foundation upon which the silo wall is set, or expansion or contraction of the walls themselves, due to change of temperature, there will be no opening of the joints, as the slabs may move relative to each other and relatively to the packing strips, while, nevertheless, keeping the packing strips in such position that the joints will be kept packed air-tight.

The foregoing is especially advantageous when a silo is first built in countries subject to such change of temperature.

When the wooden packing strips are employed, it is, of course, obvious that this silo has the further important advantage of being practically portable; or, in other words, the same can be readily knocked down and moved from one place to another, whenever so desired. This is a feature of importance to renters of farms, who oftentimes are obliged to furnish their own silos, if they are to have any, and who, under such circumstances, usually demand the privilege of removing the silo, when their lease expires.

What I claim is:—

1. The combination with masonry slabs disposed to afford a substantially cylindrical wall structure, said slabs being rabbeted on both their outer and inner vertical adjoining edges and on the horizontal edges, outer and inner wooden joint strips interposed, respectively, in the outer and inner rabbets contractible external hoops applied around the wall structure, and serving, when contracted, to draw said slabs into closer association and simultaneously to compress said outer and inner joint strips and wooden joint strips interposed in the horizontal rabbets on the outside of the slabs and held in place by the weight of said slabs.

2. The combination with masonry slabs disposed to afford a substantially cylindrical wall structure, said slabs being rabbeted on both their outer and inner vertical adjoining edges, and outer and inner wooden joint strips interposed, respectively, in the outer and inner rabbets and contractible external

hoops applied around the wall structure, and serving, when contracted, to draw said slabs into closer association and simultaneously to compress said outer and inner joint strips, said slabs, between said outer and inner joint strips having cooperating concave and convex abutting surfaces limiting the circumferential approach of said slabs but permitting the same to adjust themselves angularly to said joint strips. 10

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

HENRY F. STEINKRAUS.

Witnesses:

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ALICE E. STEINKRAUS.