April 6, 1937. W. H. SMITH 2,075,872

STAVE SILO

Filed Sept. 12, 1935

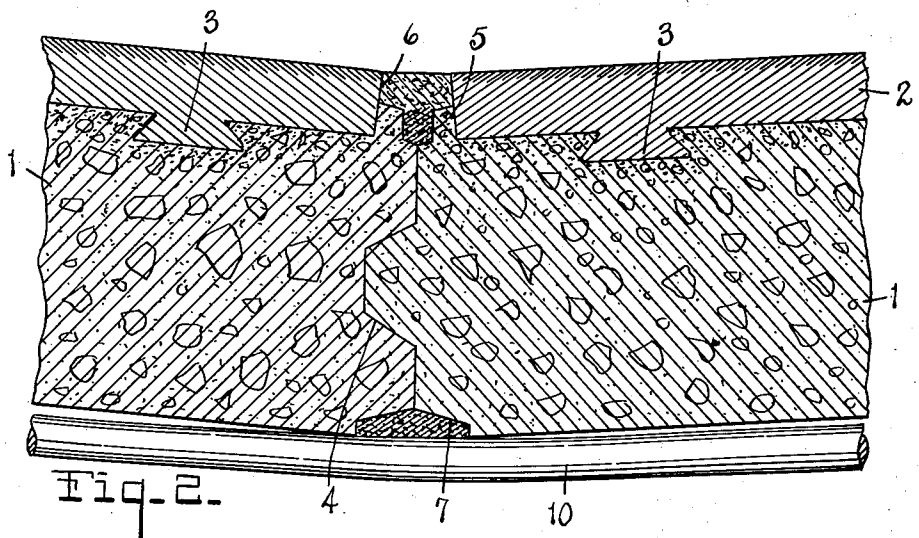


Fig. 2.

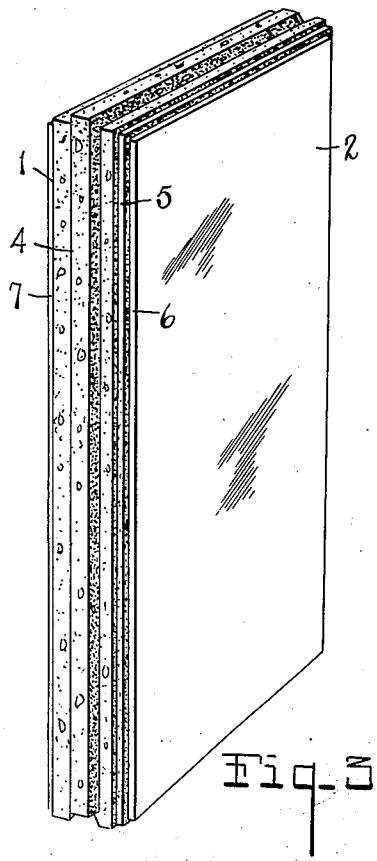


Fig. 3.

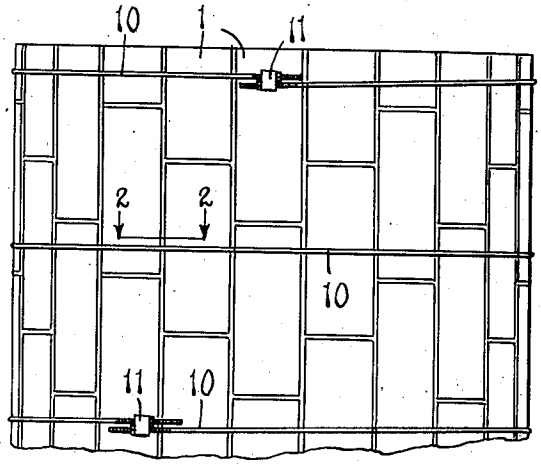


Fig. 1.

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STAVE SILO

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5 Claims. (Cl. 72—6)

This invention relates to improvements in concrete stave silos and silo staves.

The stave silo of this invention is an improvement of the combination illustrated in Patent No. 1,250,685, issued December 18, 1917, to Hiram A. Smith.

The objects of the invention are:

First, to provide a silo with a vitreous or tile lining with effectively sealed joints that effectively prevent the juices of the ensilage from attacking the concrete.

Second, to provide an improved veneered or faced tile for the purpose.

Further objects and objects pertaining to details and economies will appear from the description to follow. I describe one embodiment of the features of my invention in the following specification and illustrate the same in the drawing, in which:

Fig. 1 is an elevation view of the top part of a silo, the lower part being broken away, made of my improved staves.

Fig. 2 is an enlarged detail sectional view on line 2—2 of Fig. 1 through one of the joints between the staves and showing the manner of retaining it by the hoop or rod.

Fig. 3 is an enlarged perspective view of one of my improved faced concrete staves which is here shown with the joint formation at the ends as well as at the sides.

The parts will be identified by their numerals of reference which are the same in all the views.

1 is the tile body exposed to view in Fig. 1 and in cross section in Fig. 2, the same being of concrete with the fines developed on the inner face of the stave. 2 is the facing or veneer lining of the stave, which I preferably make of vitrified clay tile, the same having dovetailed interlocking ribs 3 on its back to insure engagement and location with the concrete body of the stave. The stave bodies in the main are of the construction described in Hiram Smith's Patent 1,325,050 of December 16, 1919, with my added veneer facing.

The body of the stave is made with a tongue and groove joint 4 with a rabbet recess 5 between the inner faces of the concrete and with a dovetail groove 6 between the facings 2 as seen in Fig. 2. I there show the surfaces somewhat oblique, but if such surfaces are left straight at right angles to the inner face, they will flare slightly when placed in the circular wall of a silo. I exaggerate this in the drawing.

On the outer face, I form a depression 7 at each edge, which may be left open for the ornamental effect. This insures fit and appearance. I preferably fill the depression with contrasting cementitious material, either clear cement or plastic composition of asphalt.

The block is formed in molds which are like the molds of the aforesaid patent. These molds are made with added ribs for forming the rabbet grooves 5. The mold is then placed on the jogger or vibrating machine such as that illustrated in the patent to Hiram Smith 1,595,255 of August 10, 1926.

The mold is then vibrated, causing the coarser aggregates to descend to the bottom or outside of the stave body and the fines to accumulate in a perfectly level manner in the top of the mold. I then place the vitreous tile 2 with the interlocking dovetail ribs downward centrally of the mold and in spaced relation thereto and jog the same into the surface of the mold. This forms a shoulder of concrete around the tile facing, which, when the same is assembled in the silo, forms the dovetail groove on space 6, whether the edge be beveled as shown or square.

These concrete staves are then cured in the usual way. The fines are developed at the top and insure perfect bonding with the unglazed surface of the tile within and the effective location of the same is secured by the dovetail ribs 3 referred to. This forms the stave with a vitreous facing 2. I have illustrated the different steps or projections in the perspective view of Fig. 3. The tongue and groove joint 4, the rabbeted groove 5 and the dovetail groove 6, formed at the point where the edge of the tile is spaced from the mold, are detailed.

These staves are assembled into a circular wall with a joint, as indicated in Fig. 2. The doors for the silo are provided in any usual manner. The joint at the rabbets 5 is filled with substantially pure cement mixture and this is covered by a waterproofing mixture, preferably an asphalt plastic material deposited in the groove 6 by the use of the usual gun for this purpose. The recess 7 at the outside may be left open and gives a very good finish to the stave body of the silo. I prefer to fill the same with cement or asphalt. The whole is retained by the tie rod or hoop 10 with the usual tensioning lugs 11 which enable the whole silo wall to be put under tension and the joints thus maintained.

I show the joint form on the ends of the staves. This is ordinarily left square.

I show a vitreous tile lining with dovetail ribs. This is highly desirable. However, a plain tile or one with other forms of projections may be used.

The method may be used with any kind of facing material, such as porcelain or glass.

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

1. A silo, the walls of which are constructed of staves having a body portion of concrete with tongue and groove joints at their vertical edges with rabbeted grooves at their inner face edges filled with a cement joint material, and recesses at their outer face edges to form grooves, a vitrefied liner plate for each stave connected thereto by a suitable dovetail and bonded to the inner surface of said stave, such stave body portion projecting beyond the same to form a dovetail recess between the said liner plates, a packing of asphaltic plastic material between the said liner plates, and a hoop for retaining the staves in place.

2. A silo, the walls of which are constructed of staves having a body portion of concrete with tongue and groove joints at their vertical edges with rabbeted grooves at their inner face edges filled with a cement joint material, a vitrefied liner plate for each stave connected thereto and bonded to the inner surface of said stave, such stave body portion projecting beyond the same to form a dovetail recess between the said liner plates, a packing of asphaltic plastic material between the said liner plates, and a hoop for retaining the staves in place.

3. A silo, the walls of which are constructed of staves having a body portion of concrete with joints at their vertical edges with rabbeted grooves at their inner face edges filled with a cement joint material, a vitrefied liner plate for each stave connected thereto and bonded to the inner surface of said stave, such stave body portion projecting beyond the same to form a dovetail recess between the said liner plates, and a packing of asphaltic plastic material between the said liner plates and a hoop to retain said staves in place.

4. A silo, the walls of which are constructed of staves having a body portion of concrete with joints at their vertical edges, a vitrefied liner plate for each stave connected thereto and bonded to the inner surface of said stave, such stave body portion projecting beyond the same to form a dovetail recess between the said liner plates, and a packing of asphaltic plastic material between the said liner plates and a hoop to retain said staves in place.

5. A silo, the walls of which are constructed of staves having a body portion of concrete with joints at their vertical edges, an impervious liner plate for each stave connected thereto and bonded to the inner surface of said stave, such stave body portion projecting beyond the same to form a recess between the said liner plates, a packing of acid resisting material between the said liner plates, and a hoop to retain said staves in place.

WARREN H. SMITH.