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THE PLASTERED OR GURLER SILO.

By H. E. McNATT.

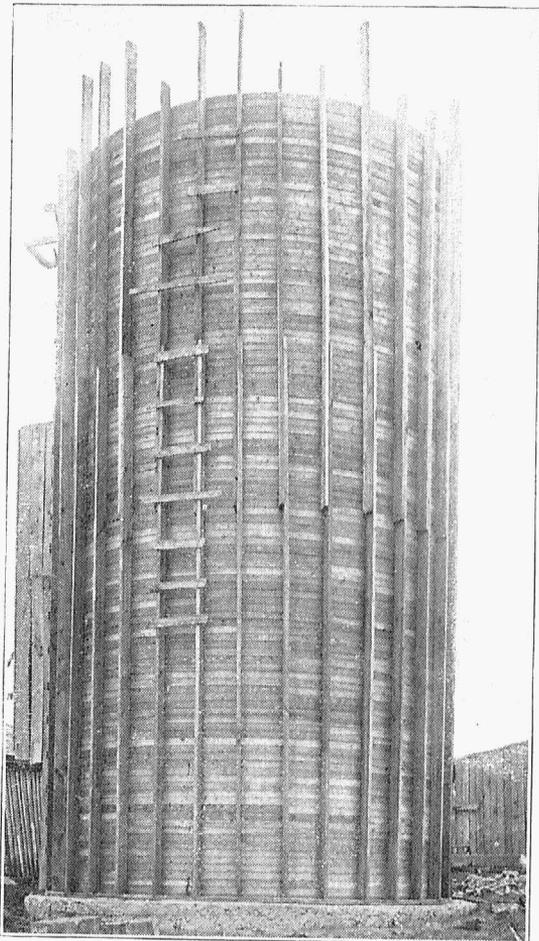


Fig. 1.—Silo complete except siding and roof.

One of the most successful types of silos is that generally known as the “plastered” or Gurler silo. This type is especially adapted to those parts of Missouri where there is still a local supply of native lumber which furnishes a cheap building material.

The Gurler silo is built much like a frame house, except that it is round in form, with a lining of boards running lengthwise around it, somewhat like the hoops of a barrel which give it strength to resist the immense pressure of the silage. Its cement plastered wall protects the wood framework from decay.

Some of the strong points in favor of this style of silo are:

1. Can be built entirely from ordinary lumber.
2. Requires no highly skilled labor for its construction.
3. Preserves the silage as well as any type of silo in use.
4. Is strong and durable when properly made.

Size of Silos.—Generally speaking, it is not advisable to build any silo more than sixteen feet in diameter. It is better to have two small silos than one too large for the herd. The best proportions are: height about twice the inside diameter.

Laying out Foundation.—A short stake is driven firmly into the ground at the point selected for the center of the silo. To the top of this is secured, with a single nail a horizontal piece of light, stiff lumber, bearing upon one end an arm sharpened so as to scratch a circle on the ground when moved around the center post (Fig. 2). This circle marks the outside limit of the silo foundation and care should be taken to get the measurements correct.

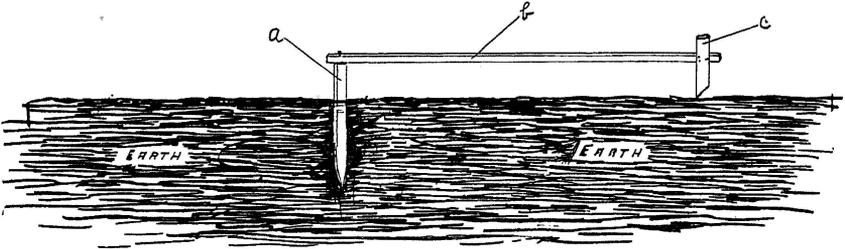


Fig. 2.—Arrangement for marking out the circle on the ground: *a*, center stake; *b*, arm; *c*, scratching piece.

Digging the Pit.—With the circle as a guide a pit is dug to a depth of from two to three feet. The wall of dirt is cut plumb and the floor leveled.

Form for Foundation.—The foundation is reinforced concrete. Figure 3 shows in cross-section the construction of one of the frames, which hold the form boards in place. These frames, which are made of one-by-four plank, should be placed thirty inches apart around the pit to hold the inside and outside form boards in place. These boards are half-inch lumber of four-inch width, so as to be readily bent to conform to the wall of the pit. The distance between the inside form boards and the pit wall should be one foot. The concrete foundation should extend about one foot above ground on the outside. Figure 3 also shows how the upper corners of the concrete wall are beveled after the concrete has become sufficiently stiff to permit this being done. The two-by-four sill with a large spike for an anchor is also shown imbedded in the top of the wall. The concrete should be made from clean, sharp sand and enough Portland

cement to insure a strong mixture. The proportions will run about as follows: 1 part cement, 2 1-2 parts sand, and 5 parts of broken stone. Enough water is added during the mixing, which must be thoroughly done, to make a mixture that is thin enough to settle to the form with light tamping but not so thin as to carry the cement out through the cracks of the form by the water leaking out. The foundation is reinforced with a piece of three foot woven wire fencing

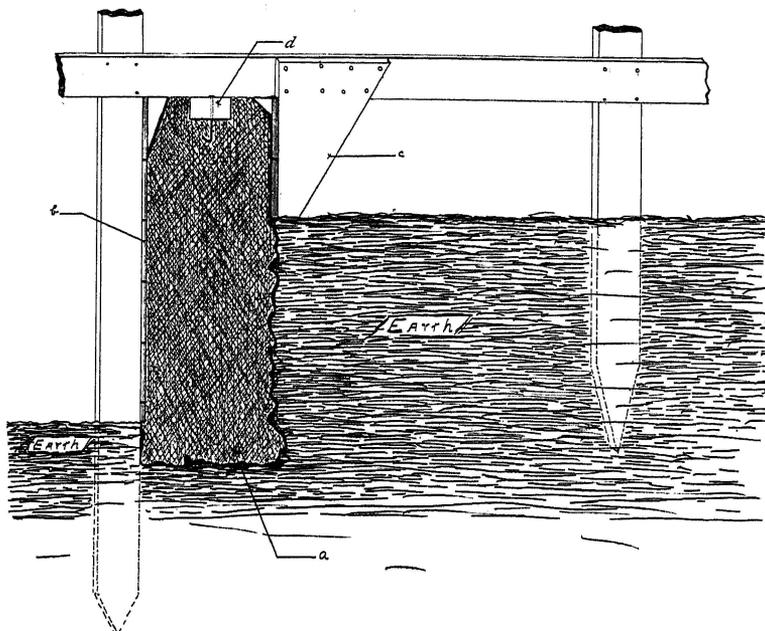


Fig. 3.—Cross-section of one of frames that hold the form boards in place. *a*, concrete foundation wall; *b*, edge of inside form boards; *c*, arm holding outer form boards; *d*, sill, showing one of the anchor spikes.

placed in the center of the form before filling with the concrete mixture.

After the wall has set sufficiently to stand alone, the forms may be removed and the floor laid to a depth of four inches. It is advisable, but not absolutely necessary, to pack about four inches of wet cinders in the bottom of the pit before laying the floor. Before the wall and floor have hardened, a finishing coat of sand and cement mixed three-to-one should be put on with a plasterer's trowel.

Figure 4 shows a view of the top of the foundation wall with the sill in place. The sill is made of two-by-four lumber cut into two foot lengths. Each piece is put in place while the concrete is soft and anchored by three heavy spike nails with turned points, or thin

bolts with nuts and washers on their ends. This anchoring is necessary, and ties the woodwork of the silo firmly to the concrete.

Figure 5, shows a vertical-section of the foundation wall and floor as it appears when complete.

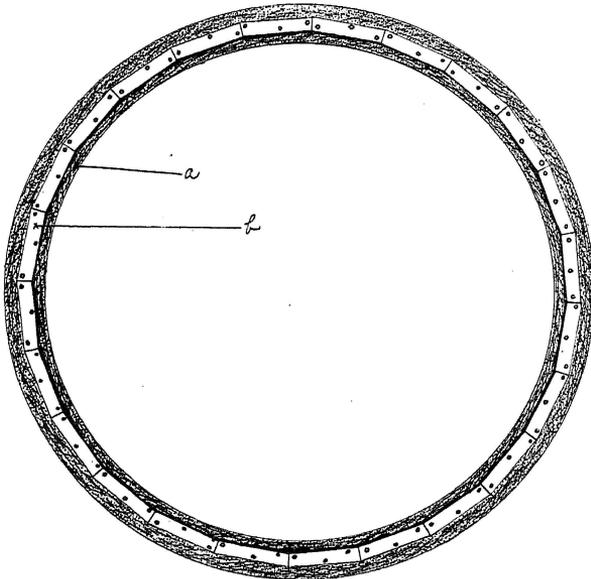


Fig. 4.—View of foundation from above showing sill. *a*, top of concrete wall; *b*, sill.

Erecting the Studding.—The studs are made of two lengths of two-by-four lumber spiked together at the middle and are erected two feet apart. If the diameter and height of the silo are more than about sixteen feet by thirty-two feet, it is advisable to either use two-

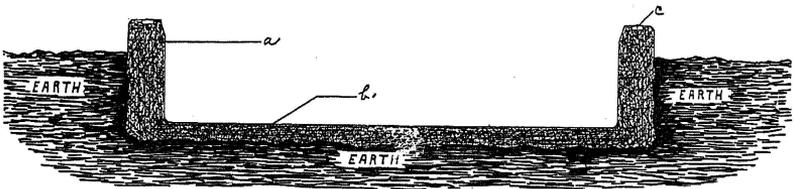


Fig. 5.—Vertical section of foundation wall showing sill. *a*, wall; *b*, floor; *c*, sill.

by-six lumber or set the studding only eighteen inches apart. Two pieces of two-by-four lumber spiked together to make a four-by-four is used as a center pole to tie the studding to while they are being set up. Each separate stud is toe-nailed to the center of a section of

the sill. Only the lower half of the studding is put up first, the second piece being spiked on after the lower half of the silo is nearly complete and needs no bracing. The studding is plumbed with a carpenter's level and tied in position temporarily with small scraps of old lumber.

Putting on the Sheeting.—When the lower half of the studding has been tied in position, the sheeting, which is one-half inch lumber made by ripping one-by-four or one-by-six lumber, is nailed horizontally on the inside of the studding, taking care to break joints. The sheeting should be nailed on from the foundation to within about a yard of the top of the studding, and then the lath put on.

The Lath.—Although somewhat expensive, the sheet steel, or expanded steel lathing found on the market, is the best for the purpose. But ordinarily the same material as the sheeting ripped into inch and

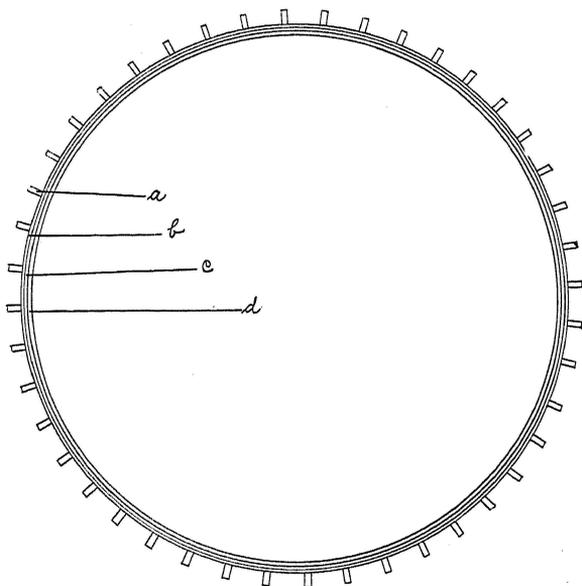


Fig. 6.—Cross-section of silo as shown on front page, showing arrangement of studding and three inner layers. *a*, stud; *b*, sheeting; *c*, lath; *d*, plastering.

one-half widths and beveled on the edges is used. These are nailed on top of the sheeting, so as to break joints, covering cracks whenever possible, and leaving a suitable space for clinching the mortar.

The Upper Half.—When the sheeting and lath have been put on to within about a yard of the top of the first length of studding, a temporary platform or trestle may be laid to enable the workmen to erect the second half in the same manner as the first was put up. It

is well to leave the center pole resting on the concrete floor and extend it by adding another piece.

The second half of the studding should be spiked to the first with a lap of about two feet. After plumbing and tying in place, the sheathing and lath are put on, and finally after removing the temporary platform, the middle is completed by putting on the sheathing and lath. Care must be taken that no wide cracks are left.

Plastering.—The wall of the silo is plastered to a depth of about one inch, i. e., about one-half inch over the lath, with a rich, well-mixed mortar or concrete, made from three parts of sharp, clean, coarse sand, or finely crushed stone, and one part of good Portland cement. This mortar should be about as thick as that ordinarily used in plastering a house.

Figure 6 in diagram a cross-section of the silo as it has been described thus far. Three inside layers are seen. The innermost is the plastering, the next is the lath and the one lying against the inside edges of the studding is the sheathing.

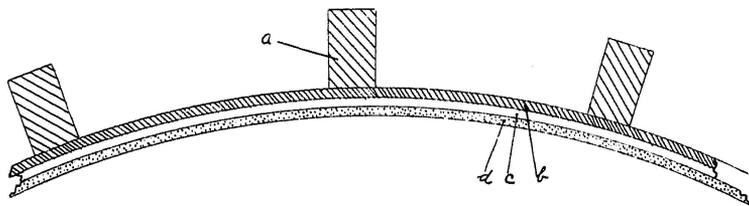


Fig. 7.—Part of Figure 6 on larger scale showing more of the detail. *a*, stud; *b*, sheathing; *c*, lath; *d*, plastering.

Figure 7 shows a small part of the same cross-section more in detail.

Figure 8 shows a longitudinal section taken down the side of one of the studs, showing the cement plaster, the lath and the lining.

The Doors.—Four doors are sufficient for a thirty-foot silo, and five are enough for a thirty-six-foot silo. Ordinarily the bottom of the first door will come about two and a half feet above the sill. The doors are two and one-half feet high and four feet are allowed between doors.

When the studding is being spliced for the erection of the upper half of the silo, care must be taken that the studding between which the doors are to come are not lapped but are put end to end and tied together with a six-foot piece of two-by-four spiked to each at the junction. This allows a door jamb which is simply another two-by-four set back from the inside edge of the stud an inch and a half, and either well-spiked or bolted in place. Figure 9 shows this region,

including the door in place, in cross-section. The upper and lower jambs of the door are made from short lengths of two-by-four spiked across at the proper places.

The doors themselves are made from flooring boards nailed and screwed together at right angles, with a sheet or two of tar paper between. This construction is illustrated in Figure 9.

In fitting the doors before filling the silo, a layer of tar paper or heavy building paper should be put between the jambs and the doors. The doors are held in place by heavy bolts, fitted with large nuts and washers, passing through them and through pieces of two-by-sixes laid across the opening on the outside of the silo. Two cross-pieces are needed; one near the bottom, the other near the top of the door.

When this point in the construction of the silo is reached, although not completed, it may be filled if it is necessary to do so.

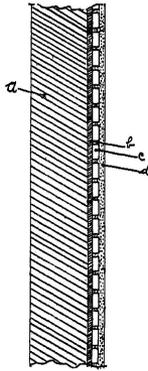


Fig. 8.—Vertical section down side of one of the studs showing *a*, stud; *b*, sheeting; *c*, lath; *d*, plastering.

Figure 1 on first page shows such a silo which has been filled and emptied once. Its general appearance, strength, and resistance to weathering, may be improved, however, by putting on a roof and some weatherboarding or siding.

Siding.—Although somewhat expensive, galvanized sheet metal makes a good siding. Probably the most practical plan, however, is to put on some hoops and nail ordinary boxing lumber to them. The hoops are made of three thicknesses of the sheeting lumber put around the outside of the silo every four feet, being careful not to cross doors. One thickness is put on at a time. The joints must break to insure strength. The boxing lumber is put on vertically and nailed to the hoops. The cracks are covered with ordinary weather strip.

The Roof.—A plate similar to the lower sill is put around the top of the silo on top of the studding. The roof is usually made in

the same manner as the roof of a house except the rafters are put up in conical form, and no joists are put in. The roof boards are put on in short lengths, and shingles or some other good roofing material put on top. A properly made door must be left in the roof through which to fill the silo.

Ventilating the Walls.—When the silo is covered on the outside in any way other than with hoops and vertical boxing, it is necessary to bore a large auger hole between each stud on the outside at the

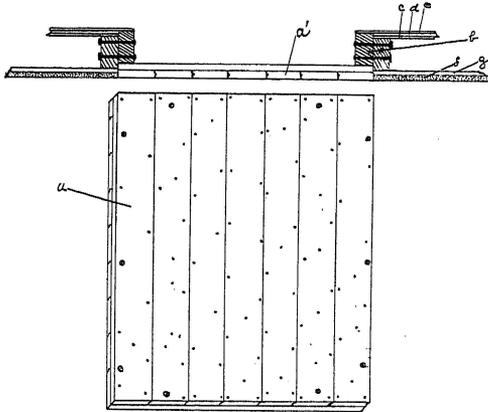


Fig. 9.—Detail of door and jamb. *a*, door complete; *a'*, cross-section of door in place; *b*, showing jamb bolted to stud; *c*, first layer of hoop; *d*, second layer of hoop; *e*, third layer of hoop; *f*, plastering on interior of silo; *g*, lath and sheeting.

bottom and on the inside at the top so as to allow the air to circulate through the wall and keep down decay of the woodwork. All holes should be covered with fine mesh woven wire to keep rats and mice out.

When hoops and vertical boxing are used, a few large sawed holes about four-by-six inches in size, at the bottom and top will serve, since the air can readily pass between the boxing and the studding.

Bracing.—It is necessary to anchor the silo firmly with three or four strong guy wires or cables of short length. These are very valuable in case of windstorms. They are attached to sleepers buried several feet in the ground about four or five feet out from the base of the silo, and run to a point on the studding about half way to the top of the silo, where they are firmly secured.