

Silo Built of Brick.

Silos have been built of ordinary field stone, and if properly constructed they are permanent, but the hauling of material and expense of a mason to build a stone wall makes it rather expensive. When using stone, the wall would have to be about one-and-a-half feet thick in order to bind it. Cement mortar is used in preference to lime, and iron rods or wire must be imbedded every two or three feet to avoid danger of the wall spreading when the heavy outward pressure is exerted upon it. Unless stone were plentiful and labor cheap, it would hardly pay to use stone entirely.

Brick Silos.

A few silos are built of ordinary brick which proves satisfactory. Cement mortar is used, and plenty of reinforcing material is put in to keep the wall from spreading. When three layers of brick are used, more or less of an air space can be left in the wall, which has a tendency to prevent freezing of the silage. Vitrified, hollow brick have also been used in building silos, and many advantages are claimed for them.

Cement Silos.

The solid-wall, concrete silo is preferred by many. Where sand and gravel are handy, the teaming can be done during the winter, which reduces the cost of building. The entire cost of the silo will depend on the local price of material and labor. This varies so much that no attempt will be made to give the exact cost as it varies from \$100 to as high as \$300, depending on the value a man puts on his time for teaming, what the contractors charge, and the amount of material used.

Some build an eight-inch wall, others a ten-inch. Some start with 12 inches and taper to 6 inches at the top, while there are silos 14 by 40 feet with only a six-inch wall from bottom to top. These have been standing several years, and appear as if they would stand indefinitely. A six-inch wall requires much less material than a ten-inch wall. Building an eight-inch wall and using one part cement to eight parts sand and gravel, a silo 10 feet in diameter and 30 feet high will require about 25 yards of gravel and 21 barrels of cement; a silo 12 by 30 feet requires 30 cubic yards of gravel and 25½ barrels of cement; one 12 by 35 feet requires 35 yards gravel and 30 barrels cement; 12 by 40 feet, 40 yards gravel and 34 barrels cement; 14 by 30 feet, 35 yards gravel and 30 barrels cement; 14 by 35 feet, 40 yards gravel and 34 barrels cement; 14 by 40 feet, 45 yards gravel and 40 barrels of cement.

A contractor who has forms, mixer, scaffold, and all necessary equipment for building, is usually employed to erect the silo. Sometimes he furnishes all the men, or he may only superintend the work and depend on all labor being supplied at the farm. Contracts are let by the job, by the day, or by the foot. Where two three-foot forms are used, six feet of the silo can be put up each day, so that for a 40-foot silo it will take about 7 days to build, and an extra day to plaster the inside. If the weather is fine the concrete will set over night, so that the forms can be raised in the morning.

If a contractor cannot be secured, forms and mixer can sometimes be rented, and the farmer can put up the silo himself. If this cannot be done, satisfactory wooden forms can be made quite easily. Six-inch boards about 3 feet in length can be bolted to two iron bands or old wagon tires. Make two circles, divided into four sections, for convenience in handling. Have the ends of the bands bent out so two forms can be bolted together. These forms can be raised and fastened in place almost as easily as the metal forms. If a mixer cannot be secured, the mixing can be done by hand. A scaffold can be

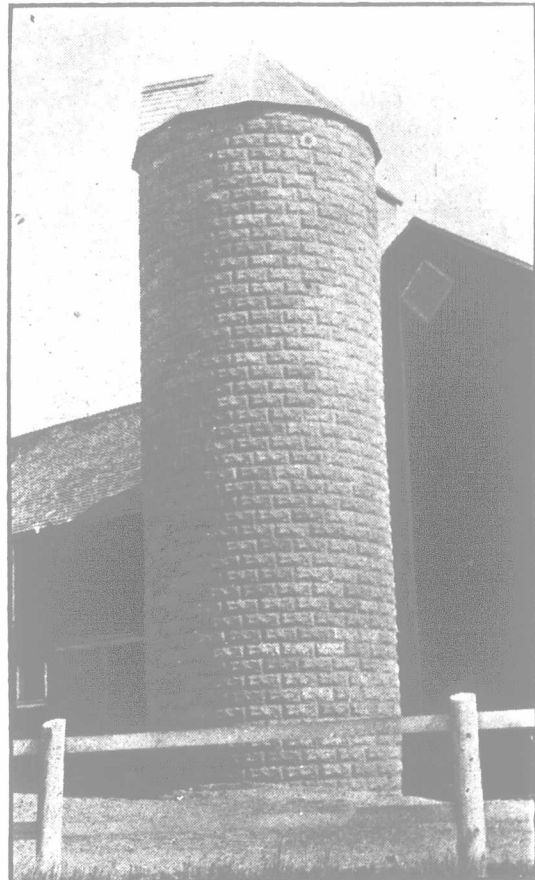
erected on the outside or inside of the silo for the workmen to stand on, and a strong gin pole must be used for drawing up the concrete. If a pole is erected on each side of the silo and thoroughly braced and cross pieces fastened at the top, the forms can be raised by block and tackle much easier than by a direct lift by hand.

Some form of reinforcement is essential. Wire or three-eighths-inch iron rods may be used for this purpose. They must make a complete band and be imbedded in the wall every two or two-and-a-half feet. Over the doors old wagon tires may be used for reinforcing. Where a continuous door is left, the rods must connect across the doors else the wall will spread. Bolts should be set in the wall every six feet on each side of the door, for fastening the chute to. Bolts should also be set in the top for fastening down the rafters.

This type of silo is claimed to be a permanent structure if properly built. They are air tight and silage keeps well in them. The chief complaint is that silage has a tendency to freeze around the walls, especially on a northerly exposure.

A double-wall silo may be built of concrete by use of special forms. Each wall is three or four inches thick and bound together in places. An air space of three inches is left which lessens the trouble from freezing. About the same amount of material, of the same strength as for a solid wall, is required, but the work of building is a little more complicated.

Cement plaster or stucco silos are said to be giving good satisfaction. Two by four studding is erected



Hollow Cement-Block Silo.

and metal lath nailed to it on both sides and covered with cement plaster. The work must be carefully done in order to insure permanency.

Cement-Block Silos.

Cement-block silos have a good appearance and make a wall supplied with an air space which lessens danger of freezing. If properly built they stand the strain, but if the blocks are not carefully made and not sufficient mortar and reinforcing material used in construction they have a tendency to crack. Block silos have been standing for a number of years, and are apparently as good or better than the day they were built. Blocks may be secured from a regular manufacturer, or the sand, gravel and cement may be drawn to the farm and a hand machine used to make the blocks, close to where they are to be used. Forms are made to give the proper circle to each block. The regular size is 8 by 8 by 16 inches. This gives an eight-inch wall with a hollow space of two or three inches. One part cement to five parts of sand and gravel is frequently used, although some make them weaker. A large number of blocks can be made in a day, and a brick or stone mason will soon build a wall with them. For a 12 by 30 foot silo, about 1,150 blocks will be required; for a 12 by 35, 1,350 and for a 12 by 40, 1,550 blocks. A 14 by 30 will use about 1,400, and 14 by 40, 1,850 blocks. About 2½ barrels of cement and 3 cubic yards of gravel are required for 100 blocks. A groove is made in the blocks for imbedding wire or iron reinforcement. As in the solid wall, this material must be joined to make a continuous circle, and should be laid at least every three rows of blocks. When they come to the doors the ends should be fastened to iron bars that extend across the doorway. In a 14 by 40-foot silo about 900 feet of three-eighths-inch iron or heavy wire should be used. Sand and

cement will be required for making mortar for laying the blocks. Some builders use a little lime with the cement. This gives an idea of the amount of material required for a block silo. The cost can easily be figured out according to local prices.

Specially Prepared Silos.

There are a number of firms manufacturing wooden silos. Material that is tough, strong and will withstand pressure is selected and carefully treated to make it rot-proof. The staves are tongued and grooved and slotted at the ends to receive a piece of steel which makes the joint, where the ends of two staves come together, air-tight. Some firms double-tongue and groove the staves, which should make them even more air-tight than the single groove. Heavy metal hoops bent the proper shape to fit tight to the staves are used. These are fastened with a lug which permits of tightening the hoops when necessary. After the foundation is built it does not take long to erect these silos. Staves, hoops, doors and roof are made to go together quite easily. The price depends on the size and make of silo. Each manufacturer claims special points for his particular make. The silage keeps well in all of them, and as wood is a poor conductor of heat or cold there is claimed to be less freezing of the silage than where concrete is used. Unlike ordinary homemade stave silos these appear to stand the strain of storms and hurricanes. In comparing the cost with concrete or other kinds, the fact that there is very little teaming and only a couple of days are required in erecting once the material is on the ground must be considered. On some makes of silos self-adjusting hoops are used. Between the lug and nut on the hoop is a coil spring which adjusts itself according to the expansion and contraction of the wood.

Hollow Block Silos.

A silo made of vitrified, hollow tile is on the market, and many advantages over other kinds are claimed for it by those who have them. The dead air space in the wall resists frost, and it is claimed that the walls are impervious to air and moisture. Continuous reinforcing bands laid in the mortar between the blocks bind the wall. The silo is claimed to be resistant against all kinds of weather or temperature. The blocks can be laid by any bricklayer.

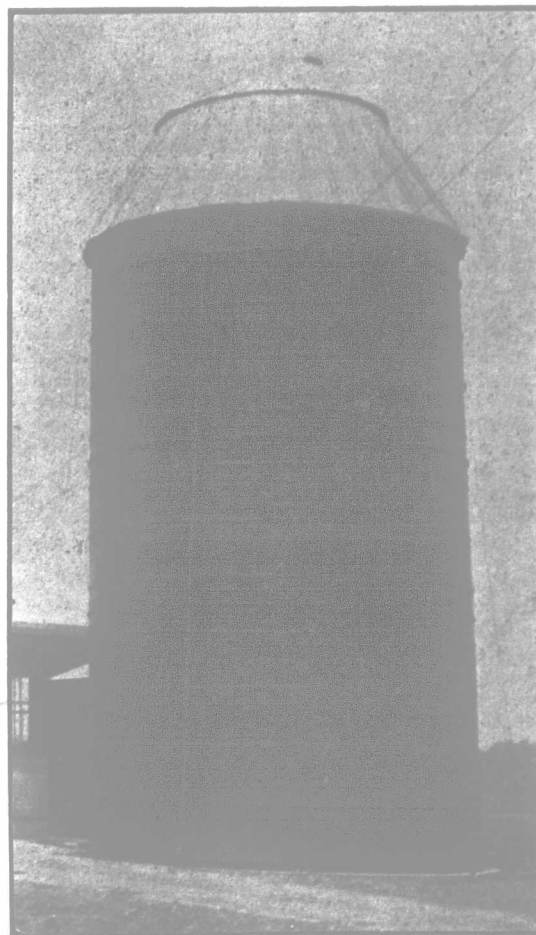
Steel Silos.

The steel silo is in use in certain sections and gives good satisfaction. It is made of heavy sheets of steel riveted together in a similar manner as a steel tank. The cost of material for a silo 12 by 30 feet will be around \$100. The cost of construction must be added to this, which with roof and chute will come to nearly \$200. The inside must be gone over frequently with a protective coating, as the silage tends to rust the metal.

The prospective purchaser of a silo has a choice of a number of kinds all of which are proving satisfactory. He must decide for himself as to the kind he will build. Local conditions may be an influencing factor.

Silo Floors.

It is generally conceded that a floor should be put in. Four inches of concrete will serve the purpose. Some run a drain from the centre of the silo to remove



Silo Built of California Red Wood.