to 2 x 12 inches, and commences between the two planks of the main post just under the main plate and runs at an angle of 45 degrees to the ridge of the roof where it connects with the one from the opposite side, and is secured there too by two pieces 2 x 12-inch plank 4 feet long, similar to collar ties. These are bolted one on each side of the roof supports. The sub-support is a single 2 x 6, which starts from between the planks of the purlin post , and runs up at an angle of 34 degrees and lies on top of the roof support, to which it fits by a long bevel, and is spiked down into the larger member.

The struts are two pieces of 2 x 4 inches, one on each side of the sub-support just after it leaves the purlin post, and connects the former at right angles to the roof support just below.

The end bents are built with similar purlin posts, and have end posts at regular 12 to 16 feet distances. These end posts are made of three pieces 2 x 6 inches, all spiked together and set edge-ways to resist the inside pressure, and are the same height as the main posts. The end beam has a 2 x 8-inch plank spiked right across, level under the main plate, one of these being inside and one outside of the end and purlin posts and then between the purlins across the center, two or more planks 2 x 10 are spiked flat across the tops of the end posts and from one-beam plank. These present the edges to the pressure and always resist well under every circumstance. To further support these ends a 2 x 8-inch plank is spiked flat against the inside of the purlin post and the inner end is spiked to the outside edge of the center end post, while outer end is kept tight up against the under side of the main plates and secured there at a distance of about 2 feet in from the corner post. This makes the end very rigid, and is actually a truss.

The main plate consists of a 2 x 8-inch plank spiked right along from bent to bent on top of the posts and another on the outside of the posts, with the top edge flush with the upper surface of the first to form a sort of angle like that used in steel construction. Then a plank 2 x 10 ins. is spiked flat on top of all and covers the edge of the second one just placed, making a plate 10 inches wide.

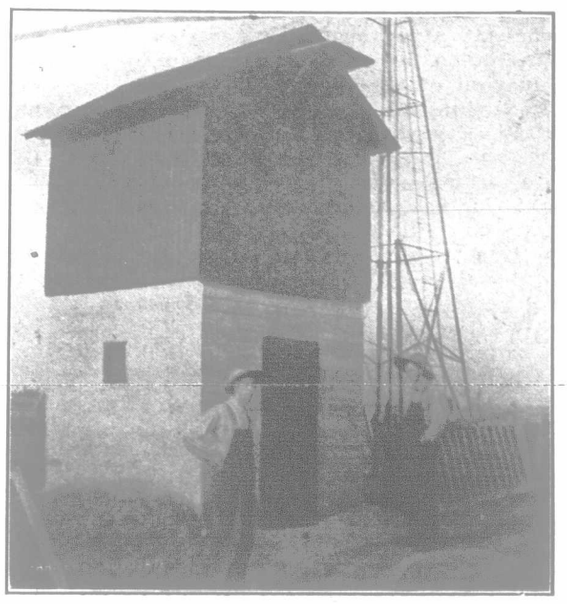
The purlin plate is made of two planks 2 x 8 inches set 2 inches apart and connected at every post with another piece 2 x 8 plank 6 feet long, which fits between the main planks of the plate. The position of the purlin plate is found as follows: Divide the width of the building into five equal parts and take the one of these on each side as the run for the lower rafters and the three remaining or center ones as the span for the upper rafters.

For example, let us suppose the barn is 40 feet wide, and it is desired to build a gambrel roof on it, the dividing will give us a sum of 8 feet for the lower rafters and 24 feet to be covered by the upper ones, this shows that the purlin plate will sit 8 feet in from the main plate measuring face to face, and as the lower roof has a rise of 18 inches to every foot of run, this means 8 times 18 inches or 12 feet above the level of the main plate will be the position of the purlin plate, while the length of the lower rafter can be found by measuring from 12 inches on one leg of the frame's square to 8 inches on the other leg; this will be in inches, of course, but just consider them as feet and you have the length. In getting the length for the top rafters, please notice that the total rise of the lower ones was 12 feet and the run 8 feet, and now take note that the span from one purlin plate to the other is 24 feet, making the run of each rafter 12 feet, and as all top roofs should have 8 inches rise per foot of run, we get 8 x 12 inches which equals 96 inches or 8 feet, which means exactly the same as if we turned the lower rafters end for end and used them for the upper roof.

This makes the nicest roof that can be built and is the strongest. The method of girthing and bracing consists of setting an upright plumb in the center of each span with the edge presented out and lined up with the outside edge of the posts. These are generally 2 x 8 and run from sill to plate. Then from each of the main posts on each side of this upright a 2 x 6 brace rises up to the main plate and rests one on either side of the upright. These also present the edges outward and to both all the girths are nailed at every bearing. The system continues around sides and ends and also in gables as a center upright extends from the end beam right up to the ridge of the upper roof.

The only tie beams in the frame are those between the main and purlin post and consist of one 2 x 8 right under the roof support, and then one 2 x 6 about 4 feet below the first, then another 4 feet below this one, while a diagonal brace runs from one to the other of all these.

Raising.—Although I have often raised these frames with men and pike poles, I prefer to use two gin poles for the work, and take the hitch around the bent at the junction of the purlin post and the roof support. In this work always have the top of the bents next the poles and lift them bodily up clear of everything so the posts can be swung over the openings and then lowered to place. All girths and braces should be put on and a guy rope from the top of the purlin posts of the first bent raised, so, as the plates go on, the frame becomes rigid and stays so until all braces are in place, when the guys can be removed. I have frequently found it best to spike a 2 x 6 across the face of the purlin post and also on the under side of the roof support to make them stiffer while erecting. Sometimes I have fastened the lower and upper rafters together at the hip joint by fish-plates on each side and pushed up both together to save time raising the top ones from a scaffold. In this case it is necessary to drop the purlin plate the thickness of the rafters to allow them to simply rest on it.



A Cement Tank.

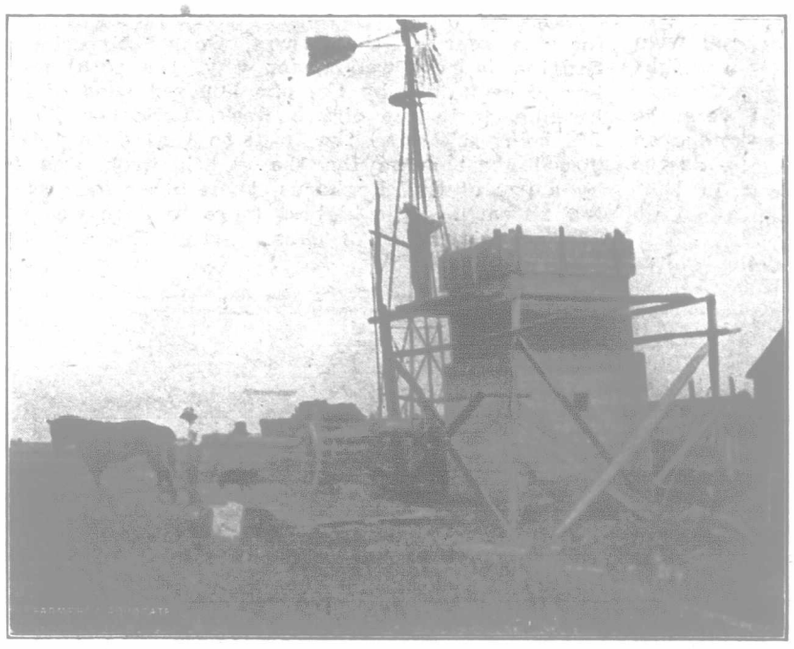
Of late years the bracing of the purlin posts is easily done by means of a rod from the the top of the end, or any other post for that matter, running down diagonally close under the lower edges of the lower rafters and secured to the main plate. Two of these on each side is enough, and they save a lot of cutting and fitting of braces.

Covering.—On account of the girths being made of light material, a good number are used, and this makes the building well adapted for covering with corrugated iron and the roofs are not boarded close, as 1 x 6 pieces are put across the rafters about 2 inches apart and furnish good nailing places for the iron. In fact, now a farmer can build a plank frame barn and cover it all with good galvanized corrugated iron for less money than he can build one of the old timber frames and cover it with rough lumber. The plank frame barn has saved farmers a lot of money, and will save them a lot more yet, if built along modern lines as have been laid down in "The Farmer's Advocate" from time to time.

In the present inquiry, the farmer desires to have a circular roof on his barn, and in that case it will alter the construction slightly, as no rafters will be used. The main posts will continue right up and over, being made of plank cut in circular form on the outside edge and bolted together. These are supported by the purlin post and roof support, but no purlin plate is used, and the whole bent, with circle top, is raised at once, and then the 2 x 6 girths are nailed on right up the sides and over the top, while braces and uprights are used at the bottom and a brace rod is put in from the top of the purlin post, down to and through the side post about 12 feet from the floor. These are in at least two places on each side, and should pull in opposite directions. These rods should be about five-eighths of an inch in diameter.

In regard to the wood best to use, I would say that spruce suits me best, but good hemlock or pine does very well.

A. A. G. BUILDER.



Building the Tank.

A Satisfactory Cement Tank

Editor "The Farmer's Advocate":

Sir,—In a recent issue of your paper I noticed an enquiry re the building of cement tanks and their usefulness. So for the benefit of your many readers I will undertake to tell how I built one last summer, and how much it cost. Not having got any advice on the subject from others, you may find faults with the methods used, but I wish to say that it is proving very satisfactory.

Knowing the lasting qualities of properly made cement, and realizing my wooden one was just done, I decided to erect a cement structure. A foundation 8 feet 4 inches square, outside measurement, and about 14 inches wide was dug down about 3 feet. This trench was filled up with cement and stone until it was level with the ground. Next a set of moulds were set on this foundation. These moulds consisted of 8 pieces made of inch lumber and nailed in sections each 2 feet wide. Thus there were the following sections: Two 8 feet 4 inches long and 2 feet wide with brackets nailed 2 inches from the ends. Two sections 8 feet long and 2 feet wide. Two sections 6 feet 4 inches long and 2 feet wide. Two sections 6 feet 2 inches long and 2 feet wide. Ten-inch blocks were made and put between these moulds i. e., the first four made the outside while the latter four made the inside, leaving a space of 10 inches between. These moulds were set up, the blocks put between and short scantlings used to bind them. They were wired at both top and bottom, as shown in the illustration. This mould was filled with cement made of eight parts gravel to one of cement with two rows of fine stones laid in the centre, and two hoops of tie wire placed a foot apart in the cement. The next day the lower wires were cut, and the moulds moved up and refilled. This was done four times, making a foundation of eight feet for the tank. Then the inside mould was used as part of a mould for the flooring of tank.

Old street railway rails were obtained from a firm in Toronto, and six of these, 7 feet 10 inches long, were spread evenly on the foundation. The outside mould was raised 8 inches. A tight flooring was fastened underneath the rails by means of wiring to them. The piping from the well and stables was put in so that the top of the open pipe was level with the outside moulds. A 2-inch pipe 14 inches long was put in the flooring, to be a waste-water pipe, with the top level with the other pipe. Between the rails was next filled with cement, made of sifted gravel five parts to one of cement, a piece of close-meshed wire-fencing was laid over the rails and imbedded in the cement. After this flooring was dry the moulds were removed and the inside one set up on the flooring of the tank, the outside one being cut down in size so that when adjusted about the smaller there was a space of 5 inches between them; thus leaving an edge about the tank of 5 inches. The moulds were then filled with cement of five parts sifted gravel to one of cement in which was placed wire hoops one foot apart. The moulds were filled three times, making the tank six feet high, where an over-flow pipe was put into the cement.

When the tank was dry the moulds, etc., were removed and a building placed over the tank. The sills, of scantlings, were bolted to the foundation by bolts that had been placed in the green flooring close to the outer edge (so that they were outside the tank wall.)

A scantling frame was put up next, boarded horizontally, building paper tacked on and then boarded with dressed lumber nailed perpendicular to the foundation and painted. The roof was put on of sheeting covered with cedar shingles, a small door made in the gable end and a double door (one outside and one inside) in the foundation. The window of the foundation was like-