

CONCRETE CONSTRUCTION.

Concrete may be described briefly as pieces and particles of rock or like material aggregated together with lime or cement. The origin of its manufacture is unknown. The massive ruins in Italy testify to its durability and of its extensive employment by the Romans. Since the introduction of Portland cement, the use of concrete has greatly extended. In England, where the first cement was manufactured, Drake states that thousands of concrete buildings have been erected of late years. The great desirability of concrete as a building material is well recognized, and rapid strides are being made in its application. Rapid as has been the increase of concrete building during the past few years, the progress would have been still greater had it not been hindered by the general lack of knowledge on the subject, the great cost of moulding or shaping the material, and the want of adequate appliances for mixing the concrete.

There are many localities where sand rock or gravel can be obtained at a nominal cost, in which concrete could be profitably introduced by any metallurgical man. And in these same districts are men plodding along in the grooves of better known trades who, by turning their attention to concrete construction, could establish themselves in a good business.

To accomplish the best results in this class of construction, it will be advisable to consult Mr. Ransome, who has had great experience in this class of work, and obtain the right of using his patented apparatus, with which buildings can be put up with unskilled laborers, provided the men are intelligently directed.

On this page we give an illustration of a building in process of erection on the system invented by Ernest L. Ransome, of this city. Mr. Ransome has received patents covering building construction, concrete mixer, and a concrete apparatus for moulding walls, houses, and other buildings.

The engraving gives an isometrical view of a building in course of erection, with part of the scaffolding removed. Ransome apparatus for moulding the walls consists of slotted standards, which being placed in pairs, one on either side of the site of the wall, and bolted together, hold in place the mouldboards, between which the concrete is placed. These standards are arranged to slide upward upon the outer face of the mouldboards as the wall progresses, and are made to conform to any breaks or projections that may be required in the building.

The moulding boards may be of any size. If they are permanently required for the apparatus, they should be surfaced and squared, and about $1\frac{1}{4}$ inches thick, 6 to 12 inches wide, and as long as could be conveniently obtained or handled. If, on the other hand, by reason of the location or other causes, they are only needed temporarily for this purpose, then their dimensions should be determined by their future use. For instance, if they are subsequently needed for flooring, then flooring could be used; if fencing is wanted, then use fence boards; if planks are required, then let planks be taken. In using them for the mould, the boards or planks are but little damaged; the bolt holes required in some of them are not large, and could easily be filled up.

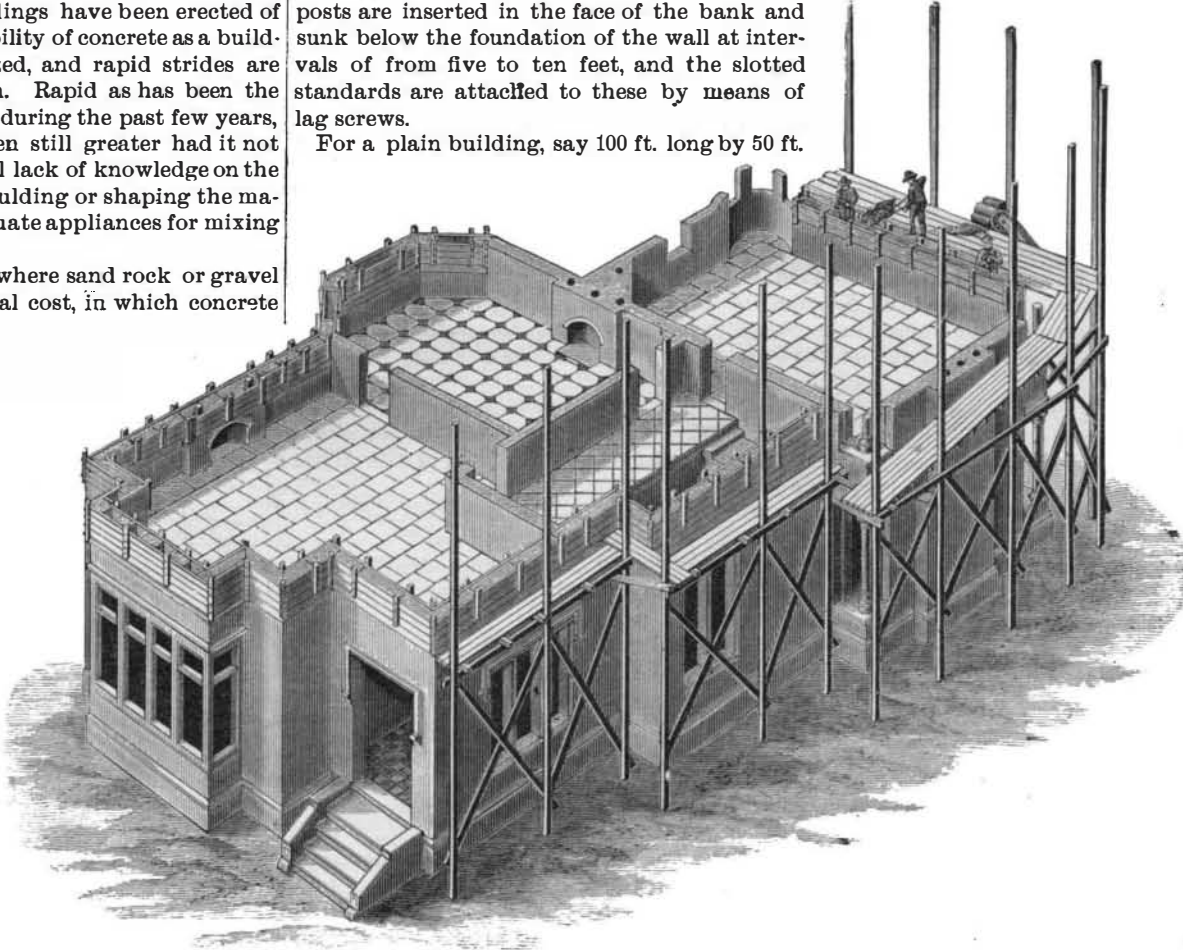
Ordinary bolts may be used for connecting the standards together, but those having winged nuts will be found more convenient. The washers should be of good size.

The *modus operandi* is as follows: The foundations being prepared and the standards and lower moulding boards all in position, concrete is put into the mould continuously, layer after layer. Moulding boards are added from time to time, as needed, until the concrete is brought to about the top of the standards. The bolts are then slackened, a set at a time, and the standards pushed up a few inches, or a foot or two, dependent upon the character of the work.

As soon as the lower bolts are in the way of the upward movement of the standards, they are withdrawn and replaced at the top of the slot. The moulding boards, liberated by these movements, are reused above those already placed as often as needed.

This action is repeated as often as may be necessary to obtain the height desired. It forms a continuous operation, and offers no interruption to the filling in of the concrete. In building retaining walls, posts are inserted in the face of the bank and sunk below the foundation of the wall at intervals of from five to ten feet, and the slotted standards are attached to these by means of lag screws.

For a plain building, say 100 ft. long by 50 ft.



ISOMETRIC VIEW OF CONCRETE BUILDING IN COURSE OF CONSTRUCTION.

wide and 50 ft. high, the cost of the apparatus, irrespective of height, would not exceed \$150, and the expense of working it would not be more than a cent per cubic foot of concrete. After building a wall, the apparatus is good for ten or twenty more. By this system the first cost is small and the expense of working slight. There is no difficulty in keeping the wall plumb, and there is no trouble in moulding projections if desired.

The large factory and warehouse recently built for the Arctic Oil Works, on the Potrero, were constructed after this manner by the patentee of the system. The fireproof roof of the warehouse was also built by him. Mr. Ransome has built many concrete foundations for buildings, machinery, etc., the largest being that of the Starr & Co. Mills, at Wheatport, Contra Costa County. The foundations of this mill were all built of concrete. In the piers, arches, and floor platforms there are 140,000 square feet of concrete. Mr. Ernest

mentioned the matter have had their vests made with good, warm backs, and after a winter's trial are quite enthusiastic over the change.

They have passed through the entire winter and spring without once taking cold, which is the best evidence in support of the thick vest-back proposition that could be adduced.

THE LAYING OUT OF GARDEN PATHS.

Where a garden is to be laid out in a perfectly flat situation, there is not, of course, the same scope for effective ornamentation as can be produced where there is a diversity of surface. One means, however, of dealing with level ground is to provide oval and circular and serpentine paths, with plainly marked borders, but so that, to the eye, the lines of the borders will be broken by trees and shrubbery, and the complete plan will not be suggested from what can be seen at any one point. Such walks should, wherever possible, lead to or by some bright little spots which one will come upon unexpectedly, and the surprise of which will heighten the pleasure obtainable from the beauty of the scene. An idea of thus laying out a circular walk may be obtained from the accompanying illustration, the planting of quick-growing shrubbery giving extension and outline to a general direction of paths, which would be governed by any growth, as of trees, that would require years to mature. When a general plan has once been adopted, however, it should be carefully kept in view in all future work in the garden, and the pruning and planting kept steadily in line with the plan laid out.



ART IN THE GARDEN.—A CIRCULAR PATH.

L. Ransome, whose office is at 402 Montgomery Street, San Francisco, California, is prepared to rent tools, sell licenses and territorial rights for his various inventions in connection with concrete construction, and give suitable instruction so that people can build for themselves.

SUGAR, glycerine, and gum arabic are the articles used to produce the glossy appearance of ink.

TOBACCO blindness is becoming a common affliction. At present there are several persons under treatment for it at one London hospital. It first takes the form of color blindness, the sufferers who have smoked themselves into this condition being quite unable to distinguish the color of a piece of red cloth held up before them. Sometimes the victim loses his sight altogether. Although smoking is to a large extent the cause of the malady, heavy drinking is also partly responsible.