

events are enormous factors in manufacturing enthusiasm. All these may be minor points, but they are just those points that will repay for recognition.

In arranging the work to be done it invariably falls out that certain individuals are more fitted to certain tasks. In the main it is a good plan to allow this natural aptitude to settle the choice of the man for the job. Care has, however, to be exercised that a just proportion of the interesting work shall be allowed to all. Even with such care it is dangerous to let men specialize too thoroughly; not only does it tend to cause the work to run in grooves for the want of a fresh outlook, but should several of the staff be absent, for instance, on military duty, during the annual holiday, or from epidemic illness, the extra work on the remaining staff may mean disorganization for several days, and perhaps months of hard labor to pull things straight again. Every chance, then, should be taken to render the individuals on the staff as interchangeable as the performance of their duties and their natural ability will permit.

### MINE TIMBERS OF DOUGLAS FIR.

In a report by Messrs. McGarvey Cline and J. B. Knapp, on the "Properties and Uses of Douglas Fir," published as Bulletin 88 of the U. S. Forest Service, it is stated that Douglas fir is used as a mine timber, both in the square and round forms, to a large extent in the western states. Squared mine timbers of Douglas fir also go to Pennsylvania and to foreign countries. It is frequently preferred to all other available species, because of its durability and strength, and because of the desirable sizes in which it may be obtained. Where a supply of this timber is at hand, it also goes largely into temporary work, such as lagging, sills, posts and caps. When it can not be conveniently procured, substitutes are frequently found in lodgepole pine and western yellow pine.

In the square form, Douglas fir has no competitor for shaft and tunnel timbers in regions where it is plentiful. Few of the large western mines use any other wood for that purpose, especially in permanent work. Its particular and most common use in the square form is for caps, sills and posts in tunnels, and for square sets in stopes.

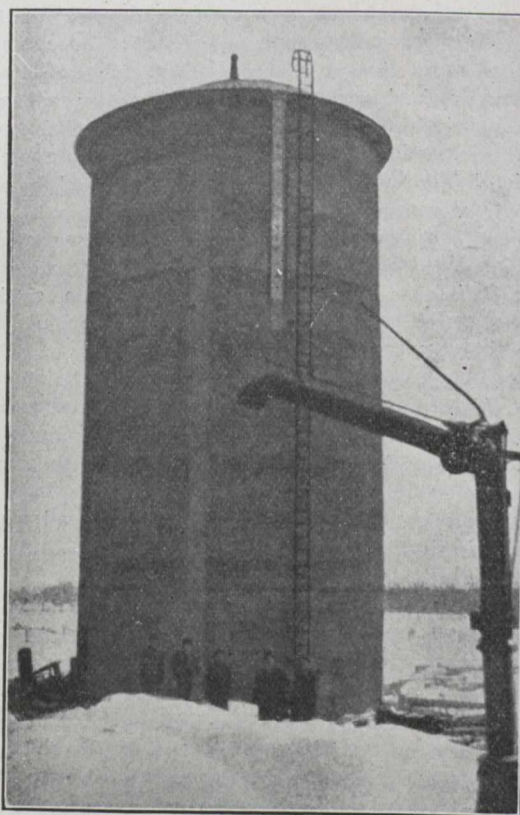
The round form of mining timber seems to be most common in Colorado, where the local species of Douglas fir, commonly called "red spruce," is used. Even in this region the coast fir is preferred for permanent work. In the southwestern section of the country, where western yellow pine is the prevailing local species, mine operators think that Douglas fir is much better, and they bring the square forms sometimes from a distance of more than 1,000 miles.

Both square and round timbers of Douglas fir are in some cases treated when used in permanent mine work. The treatment generally consists in impregnating the wood with creosote, but carbolineum and zinc chloride have been used. Round timbers are easily treated, because the soft sapwood readily absorbs the fluids. The wood should be peeled clean of bark before treatment. In the square form, the impregnating of Douglas fir with preservative fluids has never been entirely successful, because the density of the heartwood hinders the penetration of the preservative. Of late years, however, considerable progress has been made in developing a successful treatment of Douglas fir heartwood by the boiling process, followed by pressure. When treated with zinc chloride, a 3% solution is generally used. The timber is first steamed for the purpose of seasoning, and is then impregnated with the solution.

### RAILWAY WATER TANK OF CONCRETE.

In a recent bulletin of the Universal Portland Cement Company we note a description of a water tank of concrete. The tank is a 54,000-gallon tank at Austenburg, Ohio, and was built by the Steel Concrete Construction Co., of Harrisville, Pa., with steel forms. It has a tank 16 feet deep by 24 feet in diameter and is of concrete raised 32 feet above the track level. The walls are 8 inches thick at the bottom, tapering to 6 inches at the top.

No special means were used to make this work water-proof, except the use of a fairly rich mixture and a set of water-tight steel forms. The owners feel that their success in this and in many other similar tanks has been due to the use of the tight steel forms which retain in the concrete the water which carries the finest of the cement, holding this in the mass of the concrete, rather than allowing it to drain out through small openings in the wooden forms as ordinarily used. The contractors state that the costs of these tanks average twice that of wooden or steel tanks of equal elevation and capacity.



Reinforced Concrete Railway Water Tank.

The only evidence of there being water stored within this tank is at one point where the newly poured concrete was slightly frozen during construction, which was carried on during November and December of a severe winter. Here a slight seepage occurred, which has stained the surface.

Concrete railway water tanks are comparatively new, but in a few years it is probable that reinforced concrete round houses, reinforced concrete tanks and concrete posts for right-of-way fencing will become common. The railroads plan to use permanent construction methods rather than materials and methods good for a few years only and requiring continual painting and costly up-keep.