THE HOE CHISEL-TOOTH SAW

It is hardly necessary to describe to our readers the general features of the Hoe chisel-tooth saw; its merits are already well known. For many years it has been the endeavor of the right minds to invent something better than the Hoe chisel-tooth, but it seems as though the master mind which conceived this article went at once to the bottom of simplicity, which is the true element of success in a tool of this kind. The design of the Hoe chisel-tooth is something that can be grasped at once, and a child may readily understand its mechanism. To this simplicity is added a perfection which gives the tooth all the rigidity of that of a solid saw, combined with the advantages of a removable tooth.

Messrs. R. Hoe & Company have spared no expense in the constant perfection of this remarkable tool, and every succeeding year produces a better article than that produced the year before. No material is allowed to pass into the manufacture of these saws, bits and shanks without first being subjected to the most rigid tests in the various stages of manufacture.

There are now, we are informed, over 5,000 of the Hoe chisel-tooth saws in successful operation, not only throughout the United States and Canada, but in Great Britain, Australia, New Zealand and other British colonies, West Indies, Cuba, Mexico, Central and South America, Russia, China and Japan; in fact, wherever lumber is marketed. They cut accurately any kind of timber from pine to lignum-vitae and are especially successful in frozen timber.

TIMBER ESTIMATING.

Timber estimators have, as a rule, been reticent concerning their methods. Their employers, who buy and sell on their estimates, do not ask them.

As long as those immediately concerned are content, there is no need of literature on the subject; but when the value of the property of people inexperienced in sales by estimate is at stake and the owners have no personal knowledge of the record of the several estimators, they have a right to some idea of the manner of doing the work.

The fundamental principles of estimating are very simple and consist in ascertaining the number of trees, their dimensions and the percentage of merchantable timber in them. The measurement of a tree is very simple and of little importance.

The principal difficulties of estimating are: 1. Locating the land to be estimated. 2. Determining the number of trees. 3. Determining the average size of the trees. 4. Determining the percentage of defects. 5. Determining the proportions of the several grades of lumber.

In locating land the most intricate problem in land surveying may arise even where the land has been subdivided into sections or when subdivided into so-called forty-acre tracts. In such cases the adjustment of errors and the reestablishment of lost and obliterated corners require a high degree of technical skill.

In practice, lines are run and location is kept by compass and pacing or by transit and chain, according to the accuracy desired and the difficulties of the ground.

The counting of trees may seem a simple matter and under some circumstances it is. When all of a small group of trees are in view from one point it is easy to count them, but a large tract of dense timber or a few timber trees among dense saplings are different problems.

The defects of timber, whether from rot, crooks or worm holes, are matters of close study. They are to be familiarized (though never mastered) only by long study, not only in standing timber, but also in seeing defective logs put through the mill.

In estimating grades of lumber that may be manufactured from the timber in question, the highest skill is necessary. In considering methods of estimating, the differences of general forest conditions are also to be borne in mind; that is, whether the forest is broken by openings, such as lakes, swamps, meadows, brush land or burns, or whether it is young and thrifty or old and defective. In the application of European methods used in estimating cultivated uniform forests there to primeval or natural or irregular forests here, there should be great caution, for uncultivated forests rarely have such a uniform stand. That one acre may represent a forty-acre tract or that any portion of a large forest can be chosen to represent the whole is a very serious qnestion. In this fact lies a difficulty inexperienced men are apt to stumble over. The selection of representative tracts to be measured or closely estimated to serve as a factor for the whole tract is a problem the most skilled estimators are reluctant to undertake.—Pacific Coast Wood and Iron.

A FEW COMMON BOILER TROUBLES.

BLISTERS—Blisters often appear on the plates of a boiler after the boiler has been in service a short time. Formerly, when iron plate was used in boiler construction, it might be said to be exceptional to find a boiler that had been in use for some time without showing, somewhere, evidences of a blister. This was because the mode of manufacture of the iron tended to produce a laminated product of such a character that a part of the plate could easily seperate from the rest of it. If at some point the various layers of plate were not firmly united to one another, the heat conducting power of the plate would be materially lessened where the layers were not firmly united, and the result would be that outer layers could become so much overheated as to soften and bulge outward. Now that steel is used so commonly in the manufacture of boilers, it is rare to find a blistered or laminated plate, although occasionally they do occur. Blisters, in most cases, are harmless, as they cover only a small area. A blister on the heating surface can be best treated by chipping off the projecting part so as to leave a clean surface of the sound plate exposed to the fire. Unless the blister is very large in extent, it is not wise to cut out the part of the plate in which it occurs. Many a boiler has had its strength materially reduced by having part of the plate cut out in this way and replaced by a single riveted patch, when the other seams of the boiler were double riveted.

FIRE CRACKS—There are cracks extending from the edge of the plate to the rivet holes. On the horizontal tubular type of boiler they are found chiefly on the girth seams over the furnace, and in internally-fired boilers any of the joints in the firebox may show them. (The inner side of the door is liable to be attacked also.) In most cases fire cracks do not leak unless they extend past the rivet hole. In this case a ¼-inch hole should be drilled at the end of the cracks, and a stud-bolt screwed into it. This will stop the leakage and prevent a further extension of the crack. Firecracks are due to several causes. Thus they are especially likely to appear when the material composing the plate is hard, and does not possess a proper degree of ductility. Again the plate may have been injured in the construction of the boiler by the careless use of the drift pin. Poor management of the firedoors is also responsible to a considerable extent; for when the firedoors are thrown open while a hot fire is burning, so as to allow the cold air from the outside to strike directly against the heated plates, a sudden contraction of the material results, and this is likely to be followed not only by fire cracks, but also by leakages at the seams in general, or at the tube ends at the rear head. Care should always be taken to avoid all unnecessary admission of cold air against the plates when the boiler is under steam.

OIL—When heavy lubricating oils, or oils of any sort that leave a considerable residue upon evaporation, find admission to a boiler, it is almost certain that defects will sooner or later make their appearance, and will be followed by an expensive bill for repairs. The commonest way for oil to get into a boiler is by being pumped into it together with the drips from a system where exhaust steam is used for heating, and the water of condensation is returned to a receiver. In all systems of this kind an oil separator should be used, and the drip from this should be carried to a sewer. (The writer remembers a case in which the drip from sewer, so that the oil passed into the receiver even more the separator was led into the receiver instead of the directly than it would have done had there been no seperator present. The boilers at this point were nearly ruined in a very short time). In some cases the exhaust pipe from the engine may be provided with a separator, and yet the receiver may receive the returns from one or more pumps, each of which contributes a certain amount of oil. Oil also gets into the feed water in connection with condensing engines, when the condenser water taken from the hot well is used as part of the feed. It is impossible to prevent oil getting into the boiler when feed water is taken from this source. The importance of excluding oil absolutely from boilers can hardly be understood by those who have not seen the damaging effects that may result from the admission of even a small quantity of it.

PITTING—Pitting in boilers or piping is usually observed where the water is kept for a considerable time at a temperature somewhat below 212 degrees. The boilers mostly affected by this sort of trouble are those used for heating; and in these it is observed chiefly in the autumn and spring, when the boilers are used only part of the time. At such times pitting is likely to be very marked, and it is nothing unusual to see a set of tubes used up in two or three years. In an instance that came under my observation, a new boiler was put into service for power in the month of December, being used in connection with five others. Business becoming slack at this factory, about the time the new boiler was installed, only three of the available six boilers were needed at any one time. The practice was to use three of the boilers for two weeks, and then to allow these three to stand idle for two weeks, without emptying them. In the following August three of the tubes in the new boiler gave out. Upon investigation it was found that the tubes in this boiler were all badly pitted. The three that had given out were replaced with new tubes, and the boiler was thoroughly boiled with soda ash. Two more tubes gave way during this process, and were replaced.

The battery was then put in use again under the same conditions as before, except that every boiler was now emptied when not in service. This occurred eight years ago, and the tubes are still in good condition. The tubes in the older boilers were not affected, as they were covered with a film of scale which protected them. To protect boilers in which pitting takes place, the writer would advise that about 10 pounds of lime be slacked and put in each boiler. This will cause the formation of a thin scale which will prevent pitting for a time. When this protective coating is dissolved away, the operation should be repeated. Of course this treatment is not recommended for a boiler in which there is already a plentiful supply of scale. This should naturally be understood, because it is not in these boilers that pitting occurs. Still, it may be as well to speak of this point explicitly in order to avoid misunderstanding.—R. A. Douglas, in American Electrician.