VIEWS AND INTERVIEWS.

A Destructive Insect.

A report that has recently been issued gives some valuable particulars of the so-called spruce-destroying insect, which has done great damage to the spruce trees in the Adirondack region. Upon cutting down one of the infected trees for examination, longtitudinal furrows were found, varying from 1 in. to 6 in. in length under the bark, each occupied by one or two insects. The eggs are deposited along both sides of the upper part of the furrow. They lie close to each other, almost or quite in contact. When the larvæ emerge from the eggs they begin to feed upon the soft cambium, and to work their way under the bark at right angles to the main furrow. At first they are so minute, and work so close together, that they make no distinct furrows, but seem rather to devour entirely a very thin layer of the cambium. As they increase in size they gradually begin to form distinct furrows, and to take directions more divergent from each other, and from their original course. In this way colonies from contiguous furrows at length run together, and in time the whole trunk is surrounded by multitudinous pathways, and the death of the tree is accomplished. It is considered pretty evident that the trees are attacked all along during the months of June and July, and possibly as late as August. It is also suspected that the parent insect, after having established a colony in one place, may emerge from her furrow to repeat the operation in another place, either in the same trunk or another one; but this point could not be ascertained definitely.

Hints to Sawyers.

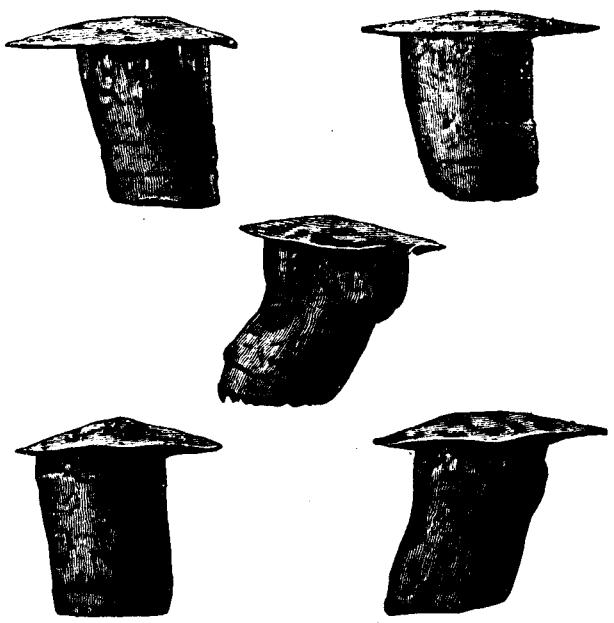
The following practical suggestions to sawyers are made by one who writes as though he knew his business:—First, acquire sufficient knowledge of machinery to keep a mill in good repair. Secondly, see that the machinery and saws are kept in good order. Thirdly, it does not follow that because one saw will work well, another will do the same on the same mandrel, or that even two saws will hang alike on the same mandrel. No two saws can be made that will run alike. Fourthly it is not well to file all the teeth of circular saws from the same side of the saw, especially if each alternate tooth is bent for the set; but file one-half the teeth from each side of the saw, and of the teeth that are bent from you, so as to leave them on a slight bevel and the outer corner a little the longest. Fifthly, never file any saw to too sharp or acute angles under the teeth, but on circular lines, as all saws are liable to crack from any sharp corners. Sixthly, keep your saw round so that each tooth will do its proportional part of the work, or if a reciprocating saw, keep the cutting points jointed on a straight line. Seventhly, the teeth of all saws wear narrowest at the extreme points; consequently they must be kept spread, so that they will be widest at the very points of the teeth, otherwise saws will not work successfully. Eighthly, teeth of all saws should be kept as near a uniform shape and distance apart as possible, in order to keep a circular saw in balance and in condition for business.

Getting Out Mahogany.

Mahogany, we are told by a writer in the London, Eng., Carpenter and Builder, though a very valuable wood is hard to get out of the forest where it grows. The way to go about the work of getting out mahogany logs is, first, to get a concession from the Nicaraguan Government. You must stand in, as the saying goes, if you get a concession; but an enterprising citizen from any country can go there and establish himself in the favor of the officials, and if he has a good record at home as a man able to attend to business, they grant him a privilege. But that is only the beginning of the trouble one has in cutting and exporting the wood. You then proceed to make bargains with the natives to cut and haul logs out of the forests. If you treat them kindly they will work for you—for a time at least. The best Indian labour costs about 2s. per day. It is often hard, however, to get them to work, as they live on fruits, and can sustain themselves without labour of any trying kind. Half of the year is called the rainy season, and it rains from May to October. It is then so wet, that one finds it impossible to get out any timber, and no one will work during the wet season. When the dry season opens they commence operations if you can get enough labour. You have to be careful with them, as they become easily misled, and often think you are taking some advantage of them. When they become convinced that something is wrong, whether they have cause to believe that such is the case or not, they get angry, and the feeling spreads among all the tribes. The woods are so dense and the work so trying on men brought there from other countries that they cannot stand it, and there is no profit in paying them what they require to risk their lives among the snakes and in the swamps where the mahogany grows. When the timber is cut they haul it, one log at a time, on a two-wheeled ox-cart especially made for the purpose. It is a very slow process, but it is the only practicable way to get the timber out. There are 400 and 500 logs to the acre, and the price of the wood is so high, partly because the timber is so hard to obtain. The average price for a good mahogany log is £25. The trade market for mahogany is in France. The price paid there is better than in the United States, where some logs are shipped and the money is paid as soon as the logs arrive in port. There are not so many fortunes in mahogany as some people imagine, as the wood is difficult to draw from the tangled forests of Nicaragua. When a man from the North goes to Nicaragua he stands the climate very well for a year and is very energetic, and wonders at the spirit of laziness that prevails among all the people. But after awhile he is overcome by the climatic conditions, and gets lazy, and is unable to work three good hours a day—if he does'nt die in the meantime.

A CASE OF DEFECTIVE RIVETING.

THE driving of rivets, says The Locomotive, is such a comparatively simple operation that it might be supposed that it would be almost always well done. This is far from being the fact, and bad riveting is one of the commonest defects reported by our inspectors. The rivets may be too short, or too long, or too small;



SOME DEFECTIVE RIVETS.

they may have heads that are too flat, or they may have projecting "fins," or they may not fill the holes, or the holes may not come "fair" with one another. There are many ways in which riveting may be bad. A case that recently came to notice seems to deserve special mention. The rivets in question were in a vertical pulp-digester, 10 feet in diameter and 30 feet high, which was to be so constructed as to be safe under a pressure of 90 pounds to the square inch. The plates were of steel, ⅝-inch thick, united by lap joints which were triple-riveted on the straight joints and double-riveted on the girth joints. The pitch of the rivets in each case was 3½ inches, and the distance between the parallel rows was 2 inches. The rivets were ¾-inch in diameter. Before the digester was accepted, we were called upon to inspect it and pronounce upon its safety. The inspector found the rivets "driven very low," that is, the heads were entirely too flat, as shown in the accompanying cuts, which are made directly from photographs of the rivets. He had a number of these taken out and found that the holes in the two sheets did not come opposite one another fairly. This defect is a common one, and it is very serious, both because it reduces the shearing area of the rivet, and beeause it greatly increases the difficulty of making the rivets fill the holes perfectly. A shop that turns out work of this kind is particularly censurable, not only because the work itself is poor and weak, but also because the defect is not easy to discover, after the rivets are in place, and the owner of the boiler is therefore likely to be deceived by a fair external appearance and to carry more pressure than the boiler can safely withstand. The inspector also found that the heads were not driven evenly over the holes, the centres of the heads often lying well towards the side of the rivet. This defect, although not so dangerous as the unfairness of the holes, would not be tolerated in a good shop having any pretentions to turning out first class work. It is very easily detected, even by one who has little experience in inspecting, and there is no excuse for it, whatever. The rivet holes were not countersunk, as they should be in all good work, and, taking everything into consideration, we think this case presented the finest example of notoriously bad work that we have seen in some time. The only thing that could be done to it, in the way of improvement, would be to cut out all the rivets, ream out the holes until they should be true, and rivet them up again with larger rivets. The most reprehensible thing about the job, perhaps, is that the builder used rivets that he knew to be *too short*. At least, we presume he knew them to be so, for any one who had the smallest idea about the business would know it. A boiler ten feet in diameter, to carry 90 pounds of steam, and with five or six men working about it, cannot be built too carefully; and any such reckless performance as putting in rivets that are too short and too small comes very near being criminal negligence. The joint used in this digester is far from being beyond criticism. To begin with, a *lap* joint should not be used at all; a *butt* joint would be much safer and better in every way. Taking the tensile strength of the plate at 60,000 pounds per square inch, and the shearing strength of the rivets at 38,000 pounds per square inch, a little calculation will show that in the joint that was actually used the rivet area is far too small, so that with ¾-inch rivets and a factor of safety of 5 the safe working pressure is only about 56 pounds. If a triple-riveted lap joint were used at all, the rivets should be an inch in diameter (holes 1 1-16 inch), and the pitch should be about 3¾ inches. This joint gives an efficiency of 72 per cent. and a safe working pressure (with a factor of 5) of just 90 pounds per square inch. But a double-welt butt joint is the proper thing for this case.

TRANSMITTING POWER.

IT is generally known that a shaft will transmit power in proportion to its running velocity, and therefore, the faster the shaft runs the lighter it should be within reasonable limit. The use of extremely heavy shafting is not advisable under any circumstances, unless actually needed to perform the work required. Some imagine that a large shaft, affording a very strong margin of safety, is the most economical and tenable mechanical position, unless tempered with sound judgment and much wisdom, sufficient of both to select properly. That there should be an ample margin of strength no one will attempt to deny, but shafting multiplies in strength so rapidly as sizes increase that the unenlightened are apt to make the selections much too large when aiming at only ample strength margin.

THE COMMON-SENSE WAY.

THE common-sense way of preventing the slipping is really the only one object to which we ought to direct our attention; there is the relation of the pulley to the belt, the method of placing a belt on a pulley, the question of speed, tightness of belts, all of which, with other points, require careful consideration. Oak tanned leather belts are best for general use. Cotton belts are best for dry places. It is economy to put on a wider belt rather than a narrow one too tight. Vertical belts should only be moderately tight.