

BALANCING PLANER KNIVES.

When the heads of a wood planer of any kind that is intended to plane or surface wide boards are made, they are balanced so as to prevent vibration at high speeds, and the knives are the same size and weight, so that when a head is set up it runs smoothly. When the knives become dull they are taken out, put on a wet emery grinder and made sharp again; but more material must be removed from some than others, therefore when put back the head is out of balance.

In order to remedy this evil the knives are taken off and weighed, after which the heavier one is taken to the drill press, or to a lathe if no drill press is available, and holes bored in it until it will balance the other when put on a pair of scales or balances.

These knives may be twenty-four inches long, and when started up again may produce inferior lumber, because it is not planed smoothly. This shows mainly that the head is not perfectly balanced, although the knives are of usual weight, causing an inexperienced operator to wonder what causes the trouble. Now, if these knives were cut in two and the halves of each pair weighed and compared, it would be plain that both ends of the head were out of balance, when considered separately, hence the trouble.

Of course it is not practical to cut these knives in two, but they may be made perfect by balancing each separately, although that may seem to be an inconsistent statement. It may be explained as follows: Suppose that a piece of iron one-eighth inch thick is put in a vise and one of these knives balanced across the edge of it, taking care to support it at the exact centre. One end of it will be heavier than the other, therefore it becomes necessary to remove some of the material until both ends weigh the same. This knife is then balanced by itself, and when the other one of the pair is balanced in the same way we know that no more trouble will result from that source; but the two knives must now be put on the balances again and made to weigh alike, as already described.

It is necessary, however, during this process to remove an equal amount of material from both ends of the heavy knife, in order to maintain the individual balance. We are well aware of the fact that it is difficult to follow the above directions for this process, because giving the knives individual balance disturbs the collective balance, and vice versa. We do not claim that this precision in balancing is necessary in all cases, for it is not, but where imperfect lumber is produced, lack of it may be, and frequently is, the cause of it.

This applies to long knives only, because short ones are not affected by it enough to be noticeable. When knives of this kind are new they are usually the same weight throughout their length and they may be kept so by careful attention to the grinding process, for if the individual or separate balance is correct, but the pair do not agree, the heavy one may be put back in the grinder and another cut taken off from it over its entire length. It is not easy to strike it just right in this way, but a little practice will enable the operator to do good work along this line. If for any reason it is desirable to continue the practice of boring holes, care

should be taken to bore the same on both ends of the knife. Of course these holes should not extend entirely through the blade, as that would weaken it unduly, but by using a flat drill ground to an obtuse angle, or, in other words, one that is made blunt, the holes will be large, thus removing a considerable material without going entirely through.—The Tradesman.

THIN CIRCULARS FOR LOG SAWING.*

By J. H. MINER, Lumberton, Miss.

Much attention is now being paid to thinner saws by practical millmen. Economy more fully asserts itself each year and millmen are beginning to draw the line more closely. Before the band saw was fully introduced it was condemned by ninety-nine out of a hundred. But thin bands or thin circulars are no longer an experiment and some fast circular mills have used nothing heavier than 10 gauge for years. True, they have been tried by many without success, but the fault was not in the saw.

The day is coming when 12 gauge saws will cut 50,000 feet per day. I received a letter recently from a prominent filer in Arkansas stating that he had cut 78 lines, 16 feet long, 12 inches deep of good lumber with a 10 gauge saw in 5 minutes. But under the same treatment that 90 per cent. of the thick saws get, not one could expect a thin saw to be a success even on a smaller output. The fact is that there are but few men who get out of the circular all that there is in it. If one man can run 72 inch by 12 gauge saws successfully, that demonstrates that it can be done. If others can't do it there must be something lacking. There are several essentials. To be a success, thin saws must be run at a high speed, must have an absolutely solid, steady running mandrel, plenty of power, and a good filer and sawyer. A thin saw is more sensitive than a thick one, and under like circumstances the thin saw cannot be expected to do as much work.

Suppose that the millman who is satisfied with 50,000 feet from his 6 or 7 gauge saws, run at a standard speed, would put in a 10 gauge 60 inch saw with 100 teeth and speed this saw to 1,000 revolutions, and could get a practical sawyer and filer that could and would run it, he would, to his surprise, increase his cut with a considerable saving in saw kerf. If the man that contemplates a new mill, and wants 50,000 to 75,000 feet per day, would put in 72 inch by 12 gauge saws, with not less than 110 teeth, with speed 1,100 and a 12 inch cylinder feed, to my mind he would have the most economical mill that could be built. There are many who are ready to assert that this is too high a speed and that the steel will not stand this strain. This is a mistake, for saws have been run successfully at this speed. The greatest drawback in introducing thin saws is to get filers who can fit them properly. The filer and sawyer must work in unison. All prejudice and personal feeling must be laid aside, both working solely to the employer's interest, instead of one or the other seeking to work to the other's disadvantage, which is sometimes done in a manner so intricate that the most

practical foreman cannot detect where the trouble is.

In running thin circulars the tension must be absolutely uniform and in exactly the proper place. There is a vast diversity of opinion about where the exact location of the tension should be, but practical filers do not disagree on this point. A variation of 1-1000 of an inch in the drop of any high speed saw will take 2 inches feed from it; that is, adjust that 1-1000 of an inch and the saw will stand 2 inches more feed.

A high speed saw can be accurately hammered only by the use of a gauge properly curved, and the saw must be hammered until it shows no light under the gauge. It will then be practically all uniform, and so far as tension goes, in perfect condition to run.

The utmost care must be exercised in the temper of high-speed thin saws. If it is not uniform then the saw will be thrown out of tension at its speed, no matter how perfectly balanced. It will astonish any practical man that uses the straight edge how much he can improve either bands, circulars or band resaws with a tension gauge of the proper curve. I could not get a saw at high-speed anywhere near uniform without one. There is no estimating what a high-speed, perfectly hammered saw will do on a quick rig with a good sawyer. At the same speed the thick saw would certainly do more work than the thin. I refer to mills maintaining their present output with thin saws. No one wants to decrease his cut, for what would be gained in one way would be lost in another. I am just in receipt of a letter from a saw company wanting to send a 9 or 10 gauge 60-inch saw here on trial. We are now using 8-gauge, 56-inch, 96 teeth, and don't think we can hold the cut at 100,000 feet per day with thinner saws. If I could increase our speed from 925 to 1,100, I would try the thinner saws.

This is an item in every up-to-date mill where trimmers and gang slashers are used. The public have had much to read in the trade papers about broken cut-off saws, but I find that the secret is in but one thing principally, and that is in giving them more set. They should be filled or ground square in front, with pitch line to centre, with the back beveled. This makes beyond a doubt the best tooth for a cut-off saw, swing or stationary. Each tooth is a cutter and a raker. If the reader doubts this, just fit up one saw and that will convince him. Large cut-off saws should be left a little slack on the rim, sufficient not to wave while in motion. Cut-off saws should be at least one gauge heavier than the standard. This will add no more in price or in power to run, but will add 50 per cent. to the life of the saw. I have never seen a cut-off saw that was not abused; getting pinched or twisted. Keep them sharp, file square in front and with plenty of set, and that will reduce the broken saw expense to a minimum. It is supposed that the reader is aware that square corners will cause cracks. The same applies to all machinery where subject to strain. Short cracks can be deeply center punched on each side which will arrest it. Cracks over three inches long should be drilled. Solid blows must be applied or the crack might extend further while punching.

*The author is an authority on circular saw hammering and fitting.