

were framed into these sills and the whole bolted together through themselves and by the bolts through the frame of the machine.

After some time, the machine arrived and was set in place. The first thing to contend with was the mistakes in the blueprint that had been furnished to make the foundation. On the eight bolts to the frame, four only fitted to the template by which the bolt holes had been bored. After the machine had been set, it was necessary to move it to get at the timbers to bore new bolt holes for the four that were wrong. The template had been carefully checked by the print and a further checking showed that it had been made right according to the instructions sent ahead of the saw. After this part of the work was done, the belt drive was put in place and in putting in the lower shaft of the machine, I noticed that the pulley, a friction clutch, was $\frac{3}{8}$ -inch out of round, and from the fact that it was nearly six feet from the outer bearing of the lower wheel to the other bearing of the shaft on the frame. I knew this was going to give trouble and so started to one of the owners.

As soon as the machine was started, the trouble showed itself. The lower wheel trembled so much that our filer expressed his doubts at being able to fit a saw so it would not crack all up from this cause. When the saw was put in motion, the trembling became less as the weight of the lower wheel had a tendency to steady the shaft. But it has never been overcome though the machine is nearly a year old now.

After running for about two months, the machine began to shake pretty badly all over, and while it did not shake on the timbers, it shook the whole frame and foundation on the ground. At the floor level, the movement was $\frac{3}{8}$ -inch while the saw was running. I finally had to slow down the engine to a speed of about one quarter less than its usual travel to keep the top wheel of the machine from breaking out of its bearings, so violent had the movement become. After a time, it was decided that they had better let me fix it in some way. I cleaned out all the dust, took up part of the floor and laid a foundation of brick and cement, closely laid in and around all the exposed timbers. This foundation was extended for two feet each side of and behind the frame of the machine, leaving only the wheel pit the same as before. This remedied the trouble of the frame of the machine shaking, the top wheel now running steady at full speed, 425 revolutions per minute, but the shake has never been taken out of the clutch pulley nor will it be until it is taken off and balanced.

We recently added another saw of the same make and to avoid any of this trouble, I put in a solid brick and cement foundation for the new machine, used a plain pulley instead of a friction clutch, and had a bevel gear to drive the cross shaft overhead, using a swinging tightener to start and stop the machine. This new machine has been started up and so far there has been no trouble of any sort; the drive working well, and the machine running steady on the substantial foundation. The new machine is a 66-inch instead of a 72-inch and the lower shaft is much shorter between the bearings. One of the most troublesome things about these machines is the way the makers have of putting the lower wheel on the shaft, shrinking it on and finishing the wheel up with the shaft in place. If there is ever any necessity of turning off the journals, there is not a lathe this side of some big city that is big enough to swing 72 inches, and repairs to a machine of this kind will be a heavy burden. The machine is somewhat cheaper than the good sorts now on the market, and the good sorts are worth all the difference, and then some, if I know anything about this class of machinery.

But when a factory owner wants a band-sawing machine, and the cost gets up around the thousand mark, a difference

of a couple of hundred dollars in first cost makes him an easy convert to the idea that the special claims and the good finish and careful work done on a good machine are merely "talking points." And at the same time, there is hardly any question but that these kinds of machines are made at about half the cost of a good machine, and the difference is about one quarter in price. They have the cheapest of rough gearing, castings and rollers full of blow holes, inferior shop work, poor boxes, no oil chambers too heavy bearings, and all the ear-marks of apprentice work at the shop. The first cost is less but what will the harvest be?

When a new machine is started for the first time, it should receive more than ordinary care, from the fact that the bearings have not been worn to a fit in the short time taken in limbering up in the shop where the machine was made. Should any defect develop, it is the business of the operator to at once have it corrected. It will not do to run the machine at all, even if only partially disabled, as any further defect or trouble would be entirely outside of the maker's guarantee, no recourse being open to the purchaser other than that offered by the builders as a matter of courtesy or to protect their own reputation.—W. Wright.

SAWING TIP OR BUTT FIRST.

German sawyers are now discussing a question which often comes up on this continent, but which has never seemed even among these latter to have received a definite and final solution, for the triple reason that opinions differ on the subject, conditions vary in different mills and with different logs, and that there is always "a new crop" of sawyers who have not taken part in previous discussion or been informed as to their trend and result. It will, therefore, be interesting to hear what is said pro and con on the other side of the water, particularly in connection with sash (or frame) sawing, for in Europe in general the circular saw for large logs is conspicuous by its absence.

Many, of course, think that it is all the same whether the logs goes through the sash tip first or butt first. But, says a correspondent of "Der Holtkauf," (whose name is not signed to his contribution, it does make a great deal of difference, as shown by practical experience, and for the following reasons:—

When logs are squared in the sash mill the tip should go first to the saws, because, despite all mechanical and other precautions, one is not so sure that the sash, when the log is through, will come out at the spot intended; and it can happen that the log in its course may be swerved laterally by bends or projections. For this reason it often happens that, despite all precautions, the log is sawed askew when the butt is precepted first. If, however, the butt is the last to come in the sash there is space for setting over during the cut, to rectify any possible error caused by lateral divergence.

But in sawing logs into boards with a gang sash the log must be sawed butt first, as in order to use it to full advantage the number of saws is regulated by the diameter of the butt. Sawing from the butt end there are dropped slabs either of full or of half length, while all the other boards are of full length and thickness. If the log were cut tip first, as where it was merely to be squared, and if the number of saws was gauged by the tip diameter, there would result thick side slabs; and if all the saws were left spanned in the sash there would be a danger of sidewise swerving of the outer ones where they entered the log. Where the cut is made from the butt these slabs, etc., are thrown backwards on to the feed rolls; when, however, the tip enters the sash these pieces are