Machinery and Mill Equipment

RUNNING BELTS SLACK.

Some do not realize the real import ot the practice of running slack belts. Now I very much doubt if many cases occur where belts are run slack for a fad, as it is sometimes called. There is a big operative economy in this practice, as I have had some experience in knowing.

Why does any man run belts tight? Simply to overcome loss of power from slipping—to get power to run the machines. But to get this power the extra load of tightening strain must also be carried by the belt in question, other belts which drive this one, and, last, the engine. The usual rule of practice puts this tightening strain at 65 pounds per inch of width for single belts and 85 pounds for double belts. So a single 6-inch belt has not only its shop load to carry, but almost 400 pounds of tension as well. A 12-inch double belt would have over 1,000 pounds of this extra load, and the engine has to carry the sum of all this on every belt in the mill. It's like putting a big stone on a horse's back and then trying to drive him to work.

This tension is the largest part of what is known as the "friction load" of a mill, and is a most important element in the operative expenses of a mill. All these tight belts mean high friction in bearings, requiring a large amount of lubrication to overcome; they often mean hot boxes, and they constantly mean work on belts, breaking of lacings or the belt itself, stoppages (often during busy hours) to take up belts, shafting pulled out of line, and always short-lived belts. Every man of practical mill experience knows these troubles, and they are bound to follow in the train of tight belts.

The writer knows of a long series of trials which some of the largest cotton mills of New England have been making with a prominent oil company to cut down their friction load by more perfect lubrication. I have seen a number of the reports, and they have succeeded in reducing it from 12 to 20 per cent. They realize what a constant expense it is. An eminent mill engineer is quoted as saying that the power necessary to turn the shafting alone in eight of the best New England mills varied from 22 to 39 per cent. of their engine power. These were the best mills, not the worst. Machine shop friction load runs higher; woodworking plants average high, also. This friction load is a clear loss and tight belts form its largest element.

It is all put up with simply because it has been necessary to keep belts tight to overcome slipping. Now, if any man finds something which will overcome slipping, and not injure his belts in the doing, I look upon that man as very much in the advance, and his slack belts are not a fad, but an indication that he is not using up a third of his power between his engine and his machines; and, furthermore, every practical engineer knows that the more contact a belt has on a pulley the more power that belt can transmit. If you decrease the point of contact to, say, one-eighth of the pulley circumference, you wouldn't get much power. So, if you increase it, by the wrap which a slack running belt has, to two-thirds the circumference of the pulley, you are bound to get more power from that drive. D.

LOOSE PULLEY.

We have a shavings exhauster driven by a cast iron pulley on a countershaft. The pulley was babbitted on the counter and is held in place by two setscrews. Some time since this pulley worked loose and twisted around on shaft, scoring shaft badly. I loosened the setscrews, but couldn't move the pulley one particle, though it had moved 1½ inches out of line of fan. With a rope I tied the pulley to the hangers, and, with a pipe wrench and pipe-extension handle, turned the shaft back in the pulley. It required two men to turn the shaft, but it finally turned. I drove hardwood wedges between the driving and driven pulleys to prevent the pulley moving back again, nailing the wedges to the driven pulley. Had there not been another pulley close to the cast iron one, we should have had to take down the entire shaft and rebushed the pulley. The best way to do, when the bore of pulley is larger than shaft, is to use a cast iron bushing to fit bore and keyed on shaft, or buy a new pulley or larger shaft. No more babbit or setscrews for me. W. W.

PATCHING BAND SAWS.

I have been patching centre cracks successfully for a number of years in this manner: Place the saw on hammering bench and overhead brackets, put a block four inches thick under saw at the crack, and apply two clamps on each side, bending the saw as in dressing a braze. Now file across the crack perfectly level until almost through the blade. I always leave the place filed off about ⅝-inch wide, which can be regulated by bending the saw and filing until almost through. File square to end of crack, then bevel back ⅛-inch, take out block and level saw, and there is a perfect groove almost through the blade. Now take a strip of saw blade one gauge thicker for patch, and file or grind it to fit the groove and braze. If a little care is taken in dressing down there will be a patch that will be hard to find. I have used this method successfully for a number of years for centre and edge cracks, and prefer it to any patch machine I ever saw. I think the objection some filers have to patching a crack is caused by a lack of proper care in applying the patch or the manner of holding it. For an edge crack I always make the patch long enough to bend to one side and apply clamp, which will hold it perfectly solid; for a centre crack I press the patch firmly in the groove and hold it there with a thin strip of pine wood held by clamp. As soon as the irons are applied the wood will burn up and cause no inconvenience. J. W.

—Man is a tool-using animal. He can use tools, can devise tools; with these, granite mountains melt into light dust before him; he kneads iron as if it were soft paste; seas are his smooth highway, winds and fire his unwearying steeds. Nowhere do you find him without tools; without tools he is nothing, with tools he is all.—Thomas Carlyle.