BAND SAW RUNNING.

By F. J. Harmon, in "Wood Worker."

GIVE a man a strange band saw, in a strange shop, and expect him to turn out a job of first class sawing the first time What must that man do to meet the conditions? He doesn't know whether the saw is in good condition, or whether it is'nt fit to saw up turnips for a lot of cows.'

The only way for this man to do is to test the saw, and if it is not right to make it so. First he will take off the saw and lay it aside for a few minutes. Then he will give a lift on both wheel axles to see if there be lost motion in the bearings. If there is, he will take it up before going further. The covering of the wheels is supposed to be in fair order, and he will pay no attention to that.

The saw should be laid on a table, or bench, coiled in three loops, if room is limited, but it is better if laid out singly Go over the saw carefully, and pinch out the kinks and bends. Most of them can be removed by merely bending the saw between the thumb and forefinger of each hand, but hammering may be necessary to remove some of the worst kinks, a mallet is the tool to do it with.

Lay the saw on a hard wood plank, or block, and a mallet will take out the kinks without bending the saw. This a hammer will not do. It bends the steel in one place by taking a kink out of another. Sometimes a saw is so badly kinked that the bad part must be cut out and the saw brazed up again.

Having made the straight saw, it is placed carefully on the wheels, and strained up Then all the guides are removed, or at least set back so far that they do not touch the saw at all. This means, as stated, all the guides, and includes as well as the top and bottom ones, that one on the "going up" part of the saw. This "guide" should not fit the saw closely. It is only intended to prevent excessive vibration of the saw blade, which is apt to occur when a heavy cut is being taken.

The saw should be revolved by hand during, and a few times after, the removal of the guides, for the wheels may be out of line and the saw get a chance to run off, if running fast at the time. Be sure the little guide just above the lower wheel is out of the way. Then, with the saw running slowly, change the hang of the upper wheel until the saw runs fair on both upper and lower wheel. Sometimes a good deal of patience is needed to bring this about, but it can be done.

Stop the saw, set a try-square on the saw table and see if the saw agrees with front edge of the blade. Try the saw in two positions—sidewise and edgewise. The nicety of this adjustment is what makes a saw cut square. If the saw is fitted with a tilting table, it does not take long to adjust things. If the table is solid, the adjusting laterally must be done by either moving the bearings of one of the wheel shafts, or by putting on more or less thickness of rubber tire on the upper or lower wheel, as may be required.

The vertical adjustment, edgewise of the saw, must be done by putting the rubber tires in good condition, when a slight movement of the top adjusting screw will make the saw track back and forth on the upper wheel as desired. But if there be a lot of ridges and hollows in the wheels, the saw will run on one ridge until the top wheel has been tilted enough to pull the saw off its bed, then with a rush it will jump across the intervening hollow to the next high place.

As stated, if the wheel tires are in perfect condition, the saw adjustment is easy, but when the tires are out of shape, there is nothing to do but to fix them up before going further. After the saw has been made to run plumb both ways, take hold of the guides and adjust them to bear easily, yet very snugly, to the saw. If a patent top guide be used, see that it is clean and well oiled, also that it is sound and free from cut places where the saw has run while the guide stood still. By "patent" guide, I mean one set at an angle to the line of the saw so that the guide wheel runs very fast in its bearings, but the saw, instead of having to run in the same place on the guide, all the time strikes clear across the guide ley, which is about half an inch wide and slightly con-

like the blank gear of a worm wheel. This kind of guide is all right as long as it is not allowed to stick and thus stand still while the saw travels in one place over it; when this happens, the hardened steel guide quickly has a slit cut into it by the back of the saw Once get one of these guides cut in this way and it is useless for the purpose intended until ground up again Therefore, if the patent guide be found cut or otherwise damaged, take it right off, put a hardwood plug in its place and send the guide wheel to be ground up again, forthwith.

I have run many different kinds of lower guides, but there is nothing I know of better than a bit of well seasoned hickory wood, put in so the wear comes on the end of the grain. Probably three pieces of wood make the best lower guides, a casting being made to hold them all in place. The back or main bearing stripes should be, as stated, of end wood, having at least two inches of vertical bearing. Some very good forms of guide-holders allow a round piece to be turned up in a lathe, then shipped into the holder, but usually a square block is used, the casting being fitted to receive it

The saw cut in end of bearing block should always be made with a narrower saw than the one which is to run in it. I like to make the cuts either by hand, with a fine back saw, or else make up a number of bearing blocks and then put on a thin saw, with no set in it, and slot all the pieces at once.

The saw guides should be made to bear at an angle of 45 degrees. They ought to be flat and smooth on their upper edges, so as to carry down and off all the sawdust and small chips that happen to fall on them. In running upwards and coming together at an angle of 45 degrees, the side guides naturally turn away all sawdust, etc., and keep it from going between saw and pulley.

Having adjusted the guides nicely, take a piece of emery wheel, or an old file set into a block, and joint the saw enough to make all the teeth touch; then set and file. After this has been done, replace the saw and with an ordinary oil stone, smooth up the sides of the saw, taking off the burr caused by filing. Next, oil the guides and saw with a rather thick oil. If sawing hard or yellow pine, it will be necessary to use kerosene oil freely to keep the pitch from gumming up the saw. In case of gum, use oil freely, then with a hard wood stick, get a bearing over the top guide and scrape off the gum as soon as the oil softens it.

A saw well sharpened, slightly set, and in the condition described as above, will cut square, smooth and true. A good test is to dress out a bit of two-inch plank about eight inches long and seven or eight inches wide, square one edge and set the block on the square edge, then run up to the saw and see if the cut commences clear across the whole side at once. If it does, the saw stands square. Then saw a half circle 1½ inches radius, out of the plank still standing on edge. The saw should cut it out so that when the core is reversed and laid back, it will fill all alike the whole width of the plank.

TEETH OF BAND SAWS.

THE usual shape and pitch of the teeth supplied by most makers of small band saws are of a very short pitch and sharp edged at the gullet so that when there is an undue strain on the saw it generally breaks, being deprived of its elasticity by the sharp angle, says an English journal. Breakages will often occur when the saw is revolving round the pulley without being in actual work, and the fractures always begin at the bottom of every second tooth. The reason of this is that when the saw runs over the pulley the teeth remain straight and form a number of edges, instead of adapting themselves to the shape of the pulley; and whenever this occurs there is a liability to breakage. By far the greater number of breakages occur through the saws being badly sharpened, which is often the case, for many sawyers either do not take the trouble of doing it correctly or have not been sufficiently instructed in the matter. We have often seen saws rendered unfit for further use by bad sharpening, the original shape and pitch of the teeth being horribly mutilated, the bottom parts, which ought to be rounded, are converted into sharp edges, and the points which ought to have an equal distance apart and an equal height, are most irregular, the result being that the saw is broken by the first turn of the pulley simply because the uneven set of the teeth puts too great a strain on the saw blade, and is sure to break at all those parts where the bottoms of the teeth have been cut sharp. This can be demonstrated by taking a brass or steel square and drawing the two ends from each other, and it will at once be seen that the square can not possibly break in any other part but at the angles, now as the saws work downwards every tooth is resisted by the wood, and is acted on in a similar way; therefore, where there are sharp angles breakages must sooner or later occur. Attention is therefore called to the necessity of keeping the teeth even and rounding them at the bottom in sharpening

SPLICING WOVEN BELTS.

MACHINERY, an English journal, furnishes the following: Everyone who has had any experience in the splicing of that class of woven belts which are now in such extensive use, is fully aware of the great difficulty which exists when it is necessary to piece them. The most common practice is to join the two ends by malleable iron fasteners, which are fitted with screwed shanks on which nuts can be placed. In what is, perhaps, the most successful of these arrangements the ends are turned up and belted together in this way. But it is obvious that, whatever may be the merits of such an arrangement, it is calculated to throw the belt out of balance while it is running, owing to the addition of weight at one point. This has not been objected to hitherto because of the general effectiveness of the fastening, but it is quite clear that a method which, while equally effective, is free from the fault named, would be of considerable value. Such a method has been introduced by an enterprising firm, who proceed by splitting the ends of the belts by suitable means. In lieu of this the belt may be woven in layers at the point where it is desired to join it, but this, of course, implies a fore knowledge of the length of belt to be required. Having obtained the necessary division, however, by any means, two of the four plys of tongues formed are cut away, and the two ends are then fitted into each other. Thus the finished joint is of practically the same thickness and weight as the rest of the belt. By means of suitable cement and glue, a perfect union is obtained, but it may be made more secure by the employment of laces, wire threads, or rivets. It is claimed that the belt pieced is not only as strong at the joining as any belt pieced by the ordinary method, but that, being of an even thickness throughout, it is in a truer balance, which in high speed machinery is a matter of some importance. The perfect interlocking of the two ends enables a secure fastening to take place, which renders the belt equal in strength at this point to any other portion of it.

PRESERVING BOILERS FROM GENERAL CORROSION.

SOME additional evidence is reported in the foreign journals of the success of the method announced a while ago for preserving steam boilers against pitting and corrosion. This is accomplished by fixing electrodes in the boilers and sending periodically currents of electricity through them, under definite conditions, adjusted and controlled by automatic action. When the current is passing from the anodes suspended in the boiler, to the shell, hydrogen is liberated on the shell and tubes and oxygen on the anodes; then, by means of the depolarizing apparatus the action is changed, most of the hydrogen and oxygen recombining, with the result that during the first period, the hydrogen performs two distinct functions -first, it disintegrates mechanically, by its volume, the scale formed on the shell and tubes, and second, some of the hydrogen combining chemically with the oxygen of the oxide of iron on the shell and tubes reduces this oxide to metallic iron, thus doing away with the oxidation of the boiler without wearing away the metal. The secondary action, in a word, is to facilitate the disintegration of the scale, hasten the mechanical action of the hydrogen in bursting it off, and prevent polarization of the shell and tubes—oxidation, it is well known, not being able to take place in the presence of hydrogen gas.