THE BAND SAW.

A BAND saw will saw probably four times as fast as a jig saw, and it works quite as smoothly, requiring no blower to keep the sawdust away. The jig saw has the great point in its favor that it is able to do inside work, so if possible have both a jig and a band saw, but if only one can be used take the band saw every time.

On pattern work, to saw a place having no connection with the outside, simply saw boldly in on a straight line until the inner design is reached, then saw around it, and draw the work away from the saw by means of the cut first made. Now glue in a thin piece of wood the width of the saw kerf, and when the pattern is finished it will not show if black shellac is used.

It is possible, (although not always convenient,) to do anything by means of a band saw that is commonly done on a circular saw, except rabbeting and dadoing pieces that are over a foot or 15 inches in length, so if it were not possible to have more than one saw for ordinary machine pattern work, the band saw would be the last to be parted with, because it covers the widest range of usefulness.

I am the champion of the band saw, for it is a noble tool when properly treated, but if not the results are poor enough, for no machine tool will realize its capabilities without proper attention. A band saw should be kept sharp, with enough set to prevent its binding on a curve, and no straggling, ragged teeth, which are worse than dull ones. It is also necessary to have the saw properly secured between guides to insure precision.

The breakages are caused oftener than any other way by crowding stock against a dull saw, or by suddenly wrenching it sidewise. Very frequently a saw about to break will give a warning thump every time the weak tooth passes through the work. When this sound becomes too pronounced, it is better to stop the machine and remove the saw, breaking it by hand before using. A saw that thumps generally has the weak spot where the joint was brazed. No one can predict, as a general thing, when a break will occur; the unexpected often happens, and sometimes when the machine is started up the blade will snap before the workman even touches it with the stock, and also sometimes when the shipper rod is shifted to stop the saw, the blade will break before the workman reaches his bench. This is apt to happen when a saw has been used for a long time.

An even tension of the blade is an important point. Some saws are provided with an index to register this, while others are not, and the workman turns the hand wheel which tightens the blade by guess, and the saw is at the mercy of the man's muscle, probably never being strained to exactly the same tension to successive times. Anyone not acquainted with band saws when entering the pattern room and looking at one, is almost sure to ask, "Do they ever break?" and when being answered in the affirmative, the next thing is, "Do they hurt anybody?" the idea in their minds seeming to be that they would wind around one like a python in case of a breakage. This idea is erroneous. There is not one chance in one hundred of being hurt, but it is a decidedly startling sensation the instant the snap comes, and it makes one jump.

I have seen many saws break, but was never even scratched save once, and then only slightly on the fingers. When the snap comes, it instantly releases all tension and also any onward motion of the saw, the ends simply throwing themselves outwards and seldom scratching one. If the wheels are not rightly adjusted the blade will not keep its proper position as it revolves, and I have known a saw to fly off the rim a number of times when in motion without breaking. Once one came off in this manner and encircled the workmen as it dropped. This is a rare instance, and the man was, above all things, little expecting to be lassooed by a band saw.

The nack of folding saw blades is hard to catch, even when watching one do it, if it is done quickly. If done slowly, and one watches carefully enough to remember each motion, it can be acquired quite easily. Whether a person who has never witnessed it can accomplish it from any description of mind, is a question I will not try to answer.

Grasp the saw in both hands at about arm's length, standing where there is plenty of room, and having the blade resting on the floor about a foot and a half from the feet. Now take one step backwards, at the same time bringing the arms together until the hands are about a foot apart. The saw is now divided into four curves, which we will call A, B, C, and D. Curve A points downwards, in front of the body, and C also in the same direction, resting on the floor. B points upward, and is governed by the right hand, and D exactly the same, only governed by the left hand. Now try to do three things at once; bring the hands together, so that curve B will cross curve D above it, and curve D take the same relative position in the opposite direction beneath it, while curve A is folded under them both. Now drop the whole affair directly over curve C, which rests upon the floor, and the saw is folded into three circles, ready to hang up. This is the common number of folds used, and they should not be increased unless for the purpose of getting the saw into a small compass for shipping purposes.

A saw can be brought into a very small compass, namely, nine circles, by taking it folded as just described, and considering it now as an entire saw, next folding it again, following the same movements on a reduced scale. This is quite difficult to do.

A better way to increase the folds above three circles is to hold the folded saw in the left hand, and with the right pull the blade out into one large loop, still retaining the folds in the left hand, and proceed as at first, only, of course, it is on a reduced scale, and throw the circles in the left hand in together with the others at the instant the saw is dropped.

A person can fold a blade just as small as he wishes by following these same movements over again for a few times.

The ends of the saw for brazing must lie upon each other, similar to the lap in an endless belt, and should each be filed back for the distance of two teeth, and then the saw placed in the brazing clamps. Do not have any two adjacent *half* teeth, as we might express it, come together pointing in different directions as to the set, but before filing the joint, take one end of the saw in each hand and place them by each other the length of two teeth, and notice if the bend in each tooth in the joint comes properly. If not, break or cut off one tooth from one of the ends, and then the trouble will be remedied.

Brazing clamps are furnished with band saws, and simply serve to hold the saw in position while being fastened. After giving the final turn with the thumb screws, be sure that the under edge of the saw is exactly in line where the joint come, and then proceed with the brazing. This can be done by using thin sheet brass, silver solder, or coin silver, and probably with other substances also, and acid or bora can be used in connection with them, together with hot blacksmith's tongs or a brazing lamp. For material I would advise silver solder and powdered borax, or if silver solder is not convenient to procure take a 10-cent piece and pound it out flat on an anvil fintil it is quite thin, say, 1¼ inches in diameter or more. Now take a piece of the silver about the size of the lap, and moisten it, together with the halves of the joint; cover the solder with powdered borax, and the joint also, both inside and out, and place the solder carefully between the overlaping ends of the saw. The moisture makes the borax stick nicely. Next apply heat.

If tongs are used, they should have thick ends or jaws and should be brought to rather more than a red heat, that is, bordering on a white, and the joint should be nipped by them for a moment, until the solder flows freely, and then be carefully removed so as not to open the laps. Next sprinkle water over the brazed part, so that the joint will not be too soft. A little practice in in this is needful, for if too much water is dashed on when the joint is still red hot it will make it so hard that there will be trouble in filing, but if this should happen it is very easy to hold the saw over a flame and draw the temper.

A good brazing lamp is much neater to use than tongs, and will save a journey to the blacksmith's forge to do the neating, and also the carrying of saw and clamp as well. In whatever manner the saw is brazed, the heat ought to be concentrated just as much as possible on the joint, so as to prevent its spreading, for heating the saw will not do it any good. If a joint is nicely made the saw should break in any other place just as readily when the time comes.

After the soldering or brazing just described, the joint must be filed and the excess of solder removed, and be sure that the blade at this point is no thicker than at any other. I consider a band saw about as easy a saw as I know of to file, and at the same time about as tedious. The teeth should be filed straight across, both on back and front, and the front should be slightly angling or hooking, so that the saw can take hold of the work to the best advantage. Machine filers and setters are coming to the front, and a really good one is an actual necessity, in a shop employing many men, simply in the time saved, but for the benefit of those who prefer to do it in the old way, I can say that I doubt if the actual results are much better than by careful hand work.—John M. Richardson, in American Machinist.

VINES DO NOT ALWAYS KILL TREES.

POPULARLY and erroneously it is believed that vines always kill the trees to which they attach themselves, but investigation shows that the belief is not confirmed by facts. The only cases of injury to the trunks of trees are when woody vines twine around the trunks. When vines travel perpendicularly in the same direction with the trunk, they may be a benefit rather than an injury. Nature has to make special provision in each tree for getting rid of useless bark, and the roots of vines like English ivy all help nature to get rid of this useless dead bark, and the shade which the leaves of the English ivy afford is a direct benefit to the living bark. These remarks apply to all vines that grow perpendicularly up tree trunks. When these vines reach the tops of the trees and spread over the branchlets, shading and in any way interfering with the healthy development of the tree foliage, then they are injurious. The English ivy seldom does this, but the American ivy, the Virginia creeper, or *Ampelopsis Virginica*, will often grow so vigorous as entirely to crowd out the leaves of the tree on which it grows. The grape vine will also do this, and so will many other climbers. It is only when they reach this mature state that vines injure trees.

AUSTRALIA AND CANADA.

Will They Exchange Their Timbers?

MR. J. E. ROUNDING, of Sydney, New South Wales, in a letter on the possibilities of commercial development between Canada and Australia, has this to say:—"In timber, as in most other products of the soil, nature has given Australia an article exactly the antipodes of the Canadian product. As the latter has vast forests of the finest soft woods, so has Australia immense supplies of hardwood unequalled in the world. By a mutual reciprocal arrangement the one could be exchanged for the other and mutual benefit ensue. Our hardwood has been proved to be the best known for paving purposes, and should be the means of solving a very vexed problem of Canadian municipalities, viz., that of the best paving material. Already the City Council of Vancouver has decided, upon my recommendation and offer, to lay down Australian hardwood blocks on the street leading to and from the Canadian Pacific railway station and wharves, probably the place where there is the most traffic in that city. For veneering purposes and furniture making our hardwoods are unequalled."

GROWING PINES.

MANY students of trees assert that, when an oak forest is cut down, pines spring up, and that oak follows pine, and so forth, but this never really occurs except where the two kinds are not far from each other. In localities where but one kind exists, that kind succeeds itself. An intelligent Nevada observer notes that, where the pine timber was cut away 20 years or so ago, fine young pine trees, apparently about fifteen years old, now cover the same area. They grow so slowly when young, she says, that few observe them, but after a few years they grow rapidly. It is about the sixth or seventh year before they start on the rapid growth.