

of his mind. Unassisted or undirected manual labor is incapable of providing for an increasing population. Mr. Atkinson says: "The saving of capital at the beginning, however little it may be, is due to prudence, self-denial, economy and sagacity; and that the productive use of capital, after it has been saved, calls for intelligence, skill and mental capacity; while the larger the capital the greater is the mental capacity required for its application of productive purposes."

SPLINTERS.

It is stated the lumber shipments from Duluth, Minn., this year by lake will be about 10,000,000 feet, a larger quantity than has ever before been shipped east from the head of the lakes. The shipments last year were about 5,000,000 feet. The eastern trade from this point is yet in its infancy, and as western competition has cut off much of the previous business done in this section, the eastern business promises to be of great importance to the lumber interests at the head of the lakes.

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MR. THOMAS H. HOTCHKISS, U. S. consul-general at Ottawa, gives the value of exports from the consular district of Ottawa to the United States for the fiscal year ending June 30th, 1889, at \$3,267,598. This is considerable of an increase over 1888 when the total was \$2,937,314. The exports in lumber last year were \$2,672,701 as against \$2,465,688 in 1888. The value of export in box shooks has increased from \$63,339 to \$234,162. It is no doubt largely owing to the great increase in the export of box shooks that the treasury department raised the duty to prevent competition with American manufacturers.

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THE Dominion government by proclamation in the *Canada Gazette* of Aug. 10th, has exempted the Ottawa river from the Chaudiere falls to McKay's Bay, and the Gatineau river from Chelsea to the mouth of the river, from the operation of the regulation which prohibits the depositing saw dust and mill refuse in navigable streams. The following streams and rivers have also been declared exempt from the same regulation: Crooked Creek, Albert county, N. B.; Nashwaak river, N. B.; Beaver creek, Ont., and that part of St. Francis river, in the county of Richmond, Que., known as "Brompton Falls." The exemption is in regard to saw dust only.

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THE Dominion government recently came to a decision in regard to the crown timber office at Ottawa. Mr. John Poupore, ex-M. P., the head of the office, has been superannuated, ten years being added to his term of service, making seventeen years in all. This will give Mr. Poupore an annual allowance of \$884. Mr. C. S. McNutt and Mr. James Ritchie have been superannuated, the former to have \$1,240 a year and the latter \$928. Mr. Jackson, a messenger, is also placed on the retired list, his allowance to be \$216 a year. Mr. A. J. H. Russel is allowed a gratuity of \$350. Messrs. Smith and Slater will probably be retained in the service of the government. Mr. Smith will be the collector of slide dues at \$1,200 a year.

Lumber for Packing Cases.

An American lumberman, writing from Liverpool to an American exchange, says: "It has occurred to me that an extensive business might be worked up in this country for packing cases among the cotton and woolen mills, and shipped here in shooks, or knock down. Especially might this be done when the Liverpool and Manchester ship canal is completed, on which from 12,000 to 15,000 men are at work. When finished the largest ocean vessel will be able to run up to Manchester without unloading here, and thus save the enormous cost of dock dues and other charges, as at present. It is said by those who claim to know, that it costs more to take a bale of cotton from Liverpool to Manchester, 35 miles, than to bring that bale of cotton from Memphis or New Orleans to Liverpool—more than 4,000 miles. The freight charges in this country are much higher than in the United States. When it is taken into consideration that 45 per cent. of all the cotton goods in the world are manufactured in the Manchester district,

the reader can understand that this means also the consumption of a large amount of lumber used to box up or pack the goods from these cotton mills. These goods are shipped to all parts of the world. In addition to these cotton mills there are in the Lancashire and Yorkshire districts a great many large woolen mills which consume a great amount of lumber for packing cases. These cases are mostly made from spruce. The lumber which comes to Liverpool, London, Hull and Glasgow—3 and 4-inch deals—is shipped to the various parts of the country, hauled from canal boats or cars to the timber yards, re-sawn in the saw mills, worked through the planing mills, and then carted to the cotton and woolen manufacturing establishments. There is waste and expense every time this stuff is handled after it is unloaded from the vessel which brings it here, until it is put into the cotton and woolen mills. There would apparently not be many different sizes, as the widths of the manufactured cotton and woolen goods do not vary greatly, and regular standard sized packing cases are required.

In mentioning the matter to an extensive timber broker here who handles large quantities of American lumber, he expressed his opinion that if this thing were taken hold of in the proper way he believed it might be made an extensive and profitable business. This could probably be done best by dealing through a responsible broker here, or in Manchester, or other places in Great Britain who had the influence to secure contracts for such stuff; and would be much more likely to succeed in overcoming the prejudices of the mill owners than if a native American undertook to go about it alone. This idea impresses me all the more from the fact that in several saw and planing mill establishments the parties who controlled the business would say to me, 'Yes, we are glad to get your American timber, but we don't want you to send us any of your worked stuff over here. We want to do that kind of work ourselves.' Of course they do. Every thousand feet of worked lumber which comes here stops just that much work passing through their mills and in time, should the business be pushed with characteristic energy of other American lumber enterprises, it would close many saw, planing and wood-working establishments in this country. In addition to this it would open a wider market for our American lumber and shut out that much from the Baltic. While these people are strongly rooted to old methods and have strong prejudices against new-fangled ideas, they are open to conviction when they can save in their purchase anything above 1 per cent. And it would seem that the saving to them in this matter would be much greater than the rate I have named."

While the above remarks are evidently intended for Americans they are equally applicable to Canadians. Manchester is the centre of the largest cotton manufacturing district in the world, from which is shipped cotton and other manufactured fabrics to every country on the face of the globe, while Yorkshire is equally noted for its immense production of woolen goods. In packing these goods for foreign shipment thousands of packing cases are annually used, and we have not the slightest doubt that by well-directed efforts, a large market could be created for a class of lumber which our manufacturers would be only too glad to sell.

OPERATING A BAND SAW.

(Continued.)

Never get in a hurry when running a band saw. You may crowd a circular saw until it gets discouraged and stops, but the band saw will not stand any such racket. Use a band saw well and it is the best tool ever placed in a shop, but abuse it as you do a circular and it will kick itself all to pieces like a loose jointed crab. Do not let the top wheel pitch backward, that is, so the saw will run hard against the flange that is cast upon the back edge of it. If you do, it will wear the back of the saw very rough, and this in turn wears out the guides above and below the table.

Pitch the wheel toward you, if it must pitch at all. If the machine is well built, the wheel should run with its arbor perfectly level, and we regard this flange, also the arrangement for tilting the wheel, as attachments worse than useless. They add to the first cost, com-

plexity and "tinkerability" of the concern. A man alters the wheel a little to make it run better. He moves it the wrong way, and it takes him half an hour to get the wheel set again so that the saw will run.

Don't allow any waste wood to lie upon your saw table; as fast as you cut off a piece, push or throw it off. These pieces are apt to get where you don't want them and make trouble. One of them may fall through the table beside the saw, if very small, and get between the saw and pulley, or it may stick in the table and pinch the saw. In either case you can count on taking half an hour with the brazing tongs.

Keep your band saws true. If you can't make a saw run true, don't run it. Either spoil it or fix it, or get an expert to do it for you. If the back of the saw is not straight, it should be made so. It must be hammered. If there is a concave spot, the hammering must be done at the roots of the teeth, but if you find a convex place the back of the saw needs the hammer. A blow of the hammer stretches the saw, that is all there is about the mystery of saw hammering; bear it in mind and you will soon learn where to strike.

If a saw breaks while running, it is very apt to double up short just where it goes through the saw table. Sometimes it gets a twist which makes you think of a lightning rod. With a little care and a good deal of patience, you can straighten a saw. Bend out all the big places first. Do all you can with your fingers. Don't lay the saw on a board and go for it with a mallet, for doing so will only put in lots of new kinks, without taking out any of the old ones. Perhaps you will find a place that must be cut and braced. If so, do it at once, before straightening the saw. Let that poor place go, straighten the saw ever so nicely, and it will break at the place, and you will have all your straightening to do over again.

Let a saw once get bent and it will bend again the first chance it gets. It seems to take all the backbone out of a saw to get a short bend in it. When you get the saw straight on the back, hammer out all the bends. Some of them can best be worked out with a pair of small pliers. When ready to file, put the saw on the machine and joint it. Look it all over and see how many twisted places you can find. One of these twists is worse than a dozen kinks. It requires a good deal of engineering to get them out of the saw, but out they must come if that saw is to be good for anything.

Joint the saw well before you file it. The best thing to joint a saw with is a piece of Turkey emery paper just as it came from the mine. Some people use a vulcanite wheel or a piece of one, but this is apt to be too soft. Don't use a stone which the saw will cut into. It corners off the teeth and leaves them rounding. An Arkansas slip is a good thing for jointing saws, and the small flint stones that are found in chalk quarries will also answer the purpose tip-top. Whatever stone is used, see that it has a good flat face where it is applied to the saw. Grind it true on a grindstone or emery wheel. Put a clamp on the stone and you can hold it square with the saw to. Joint one side more than the other and you will have to "carry a helm" all the time and will cut more circles than you want.

Don't set the saw too much. A printed sign should be stuck up over every bench and nailed to every clamp or vice for filing saws. It should read: "use as little set as possible." Just enough to let the saw run free, is all that is needed. For very small circulars use a very narrow saw, but do not try to set a $\frac{3}{8}$ -inch saw wide enough to turn around in a half inch circle.

Some band saws have one guide above the table and some have two, and the guide with two bearings is the one you want every time. A saw mill sometimes vibrates back and forth above the guide just like a fiddle string. When it does this, it is apt to have another vibrating spot just where the table comes, and then it works mean, and you can't make it cut smoothly. With a double guide, this vibration does not occur at the level of the table. Keep the guides snug to the saw. Have them fit well and oil them once in a while. First-class band saws have a little chute rigged just below the table to carry off the chips and saw dust. It should be upon every saw. Chips and dust don't do any good when they get between the saw and the pulley, or the pulley and the floor.