CANADIAN WOODWORKER

Vol. 1.] OCTOBER 1908 [No 8

PRINCIPAL CONTENTS

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Address all Correspondence to the Publishers.
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TORONTO CANADA

John Ballantine & Company

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PRESTON, - ONTARIO

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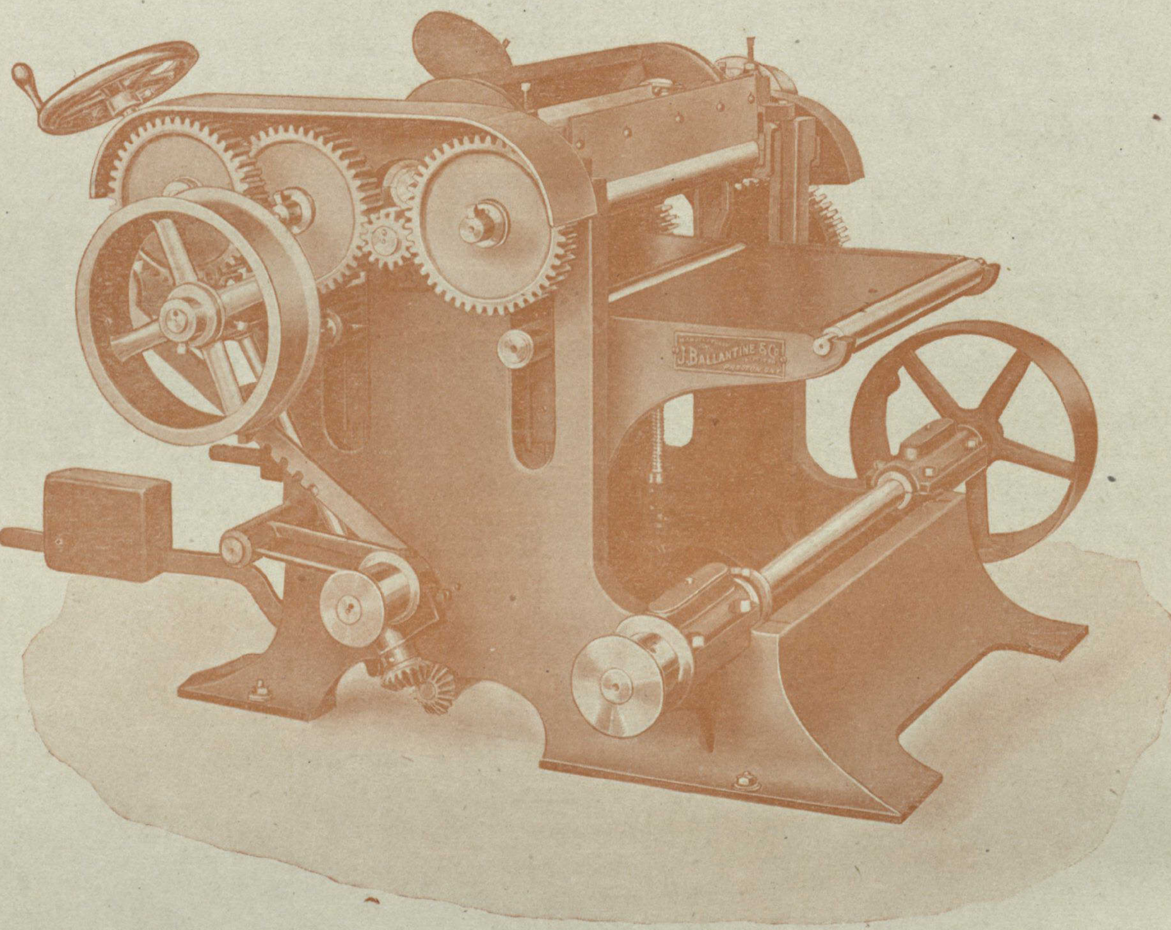

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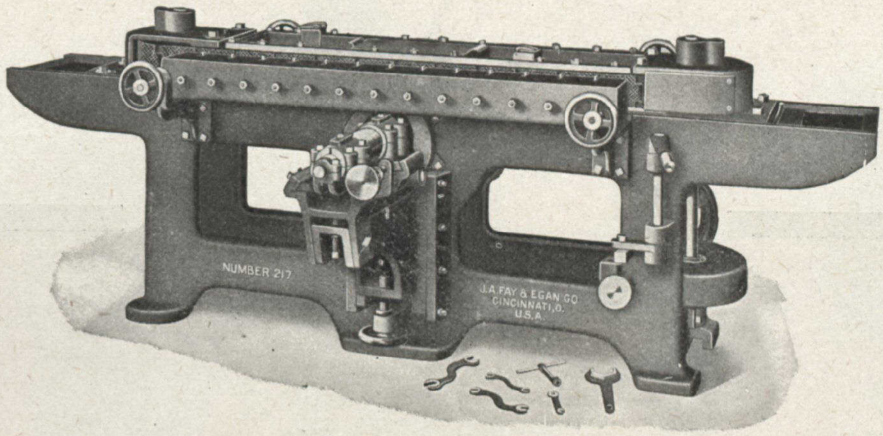

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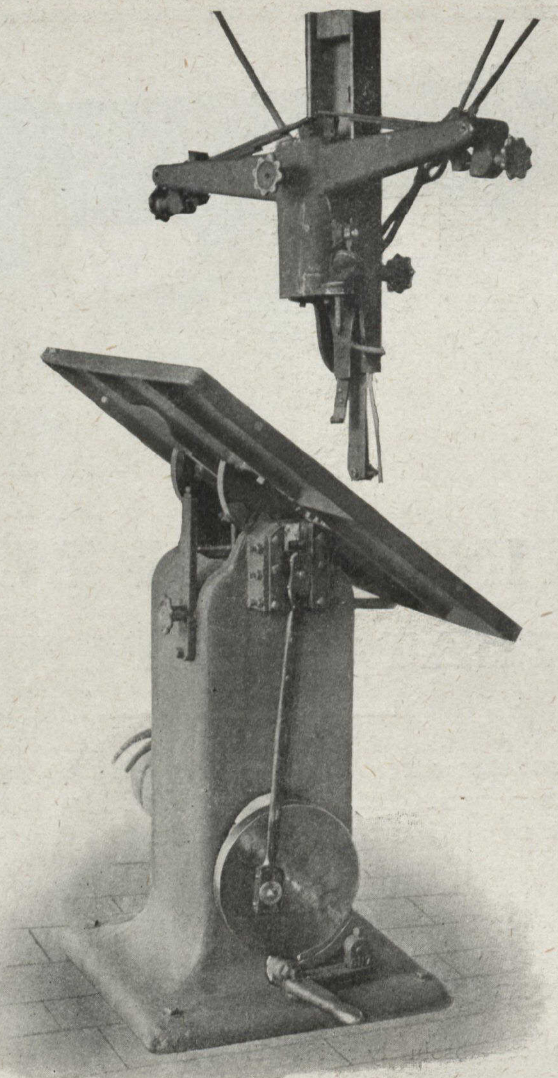

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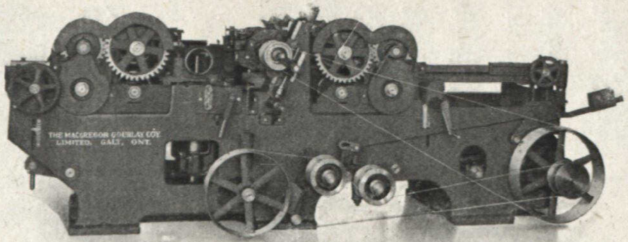

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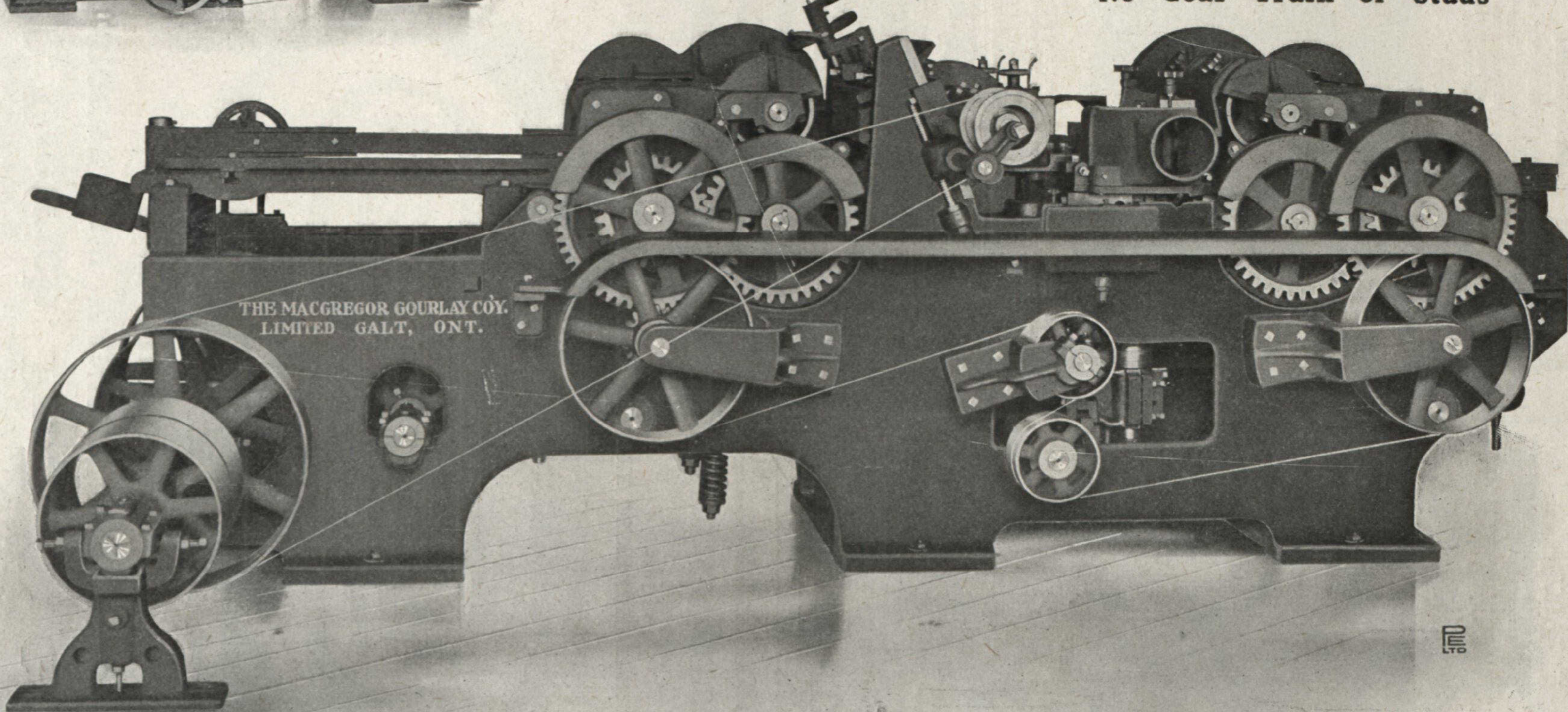

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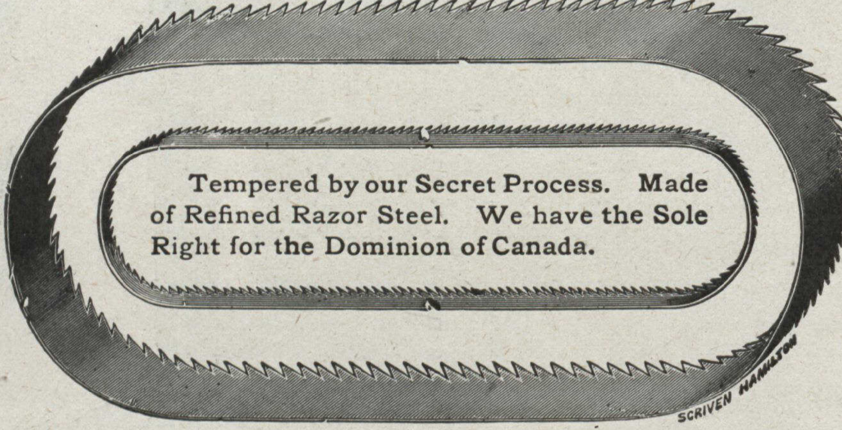

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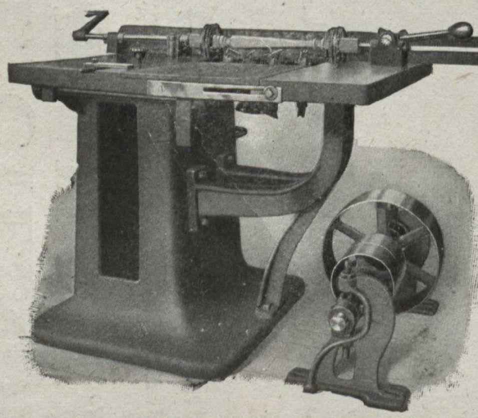

This machine is built like a machine tool—solidly, substantially—and is in a class by itself for the quantity, variety and quality of its work. For making your regular turnings, for working up odds and ends, for the jobbing establishment—it fits in almost every shop and makes good from the jump.

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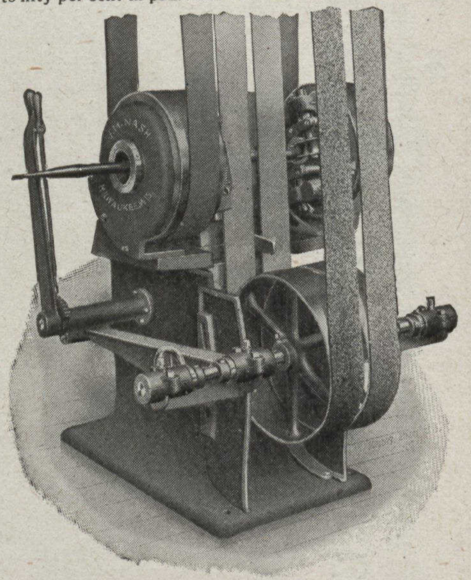

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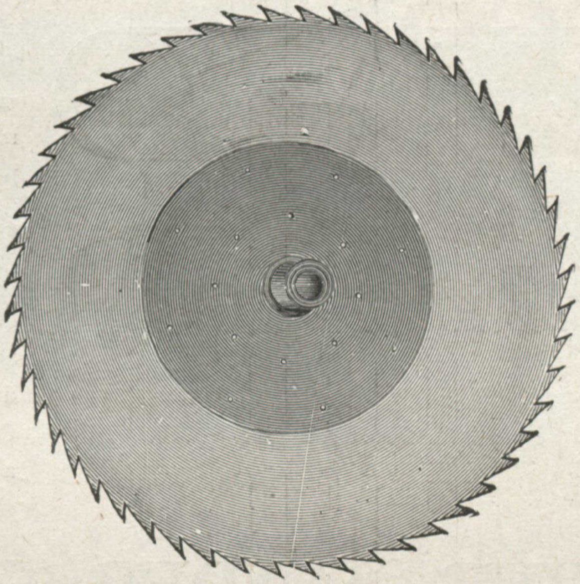

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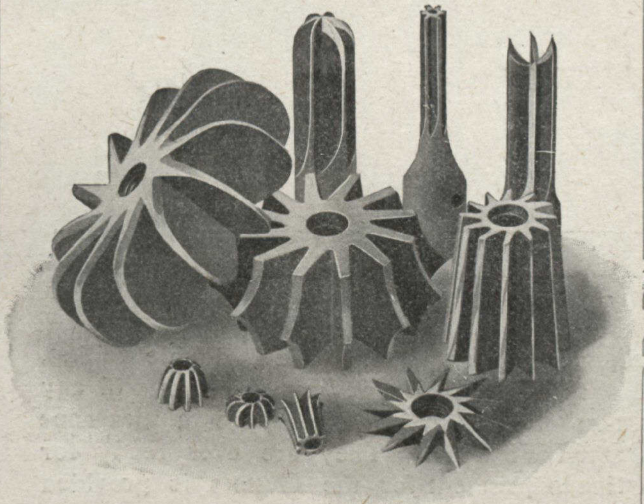

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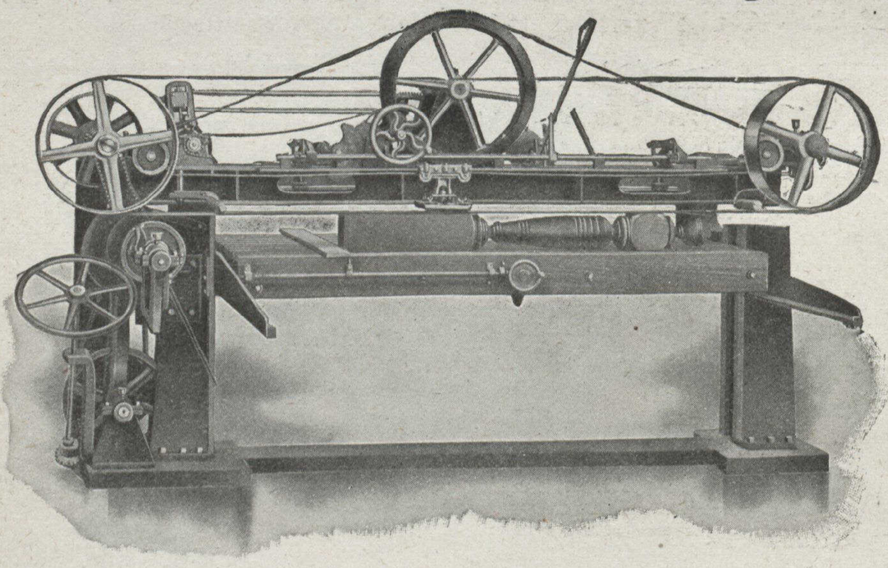

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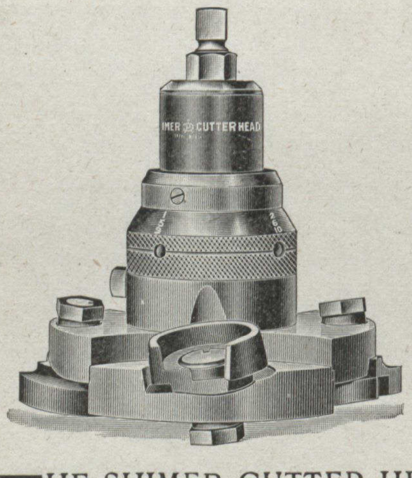

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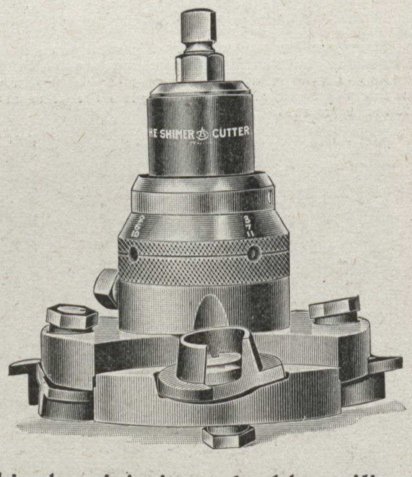

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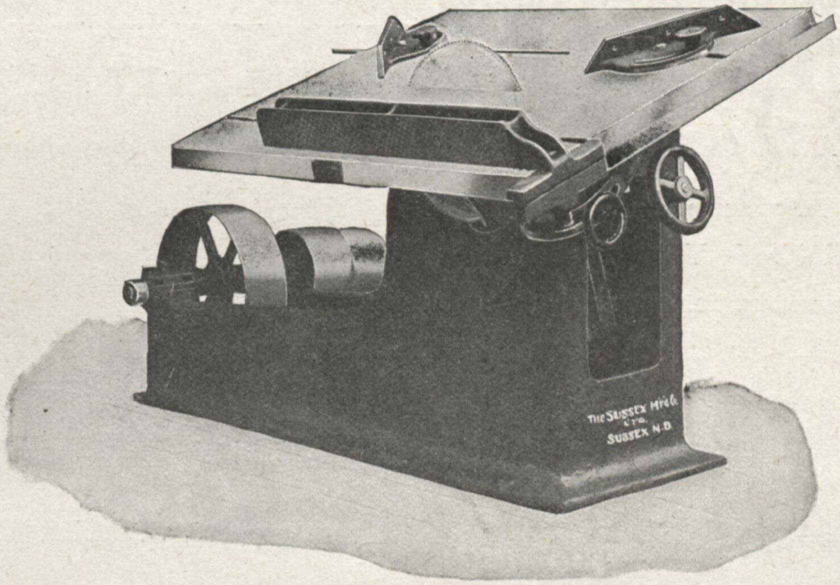

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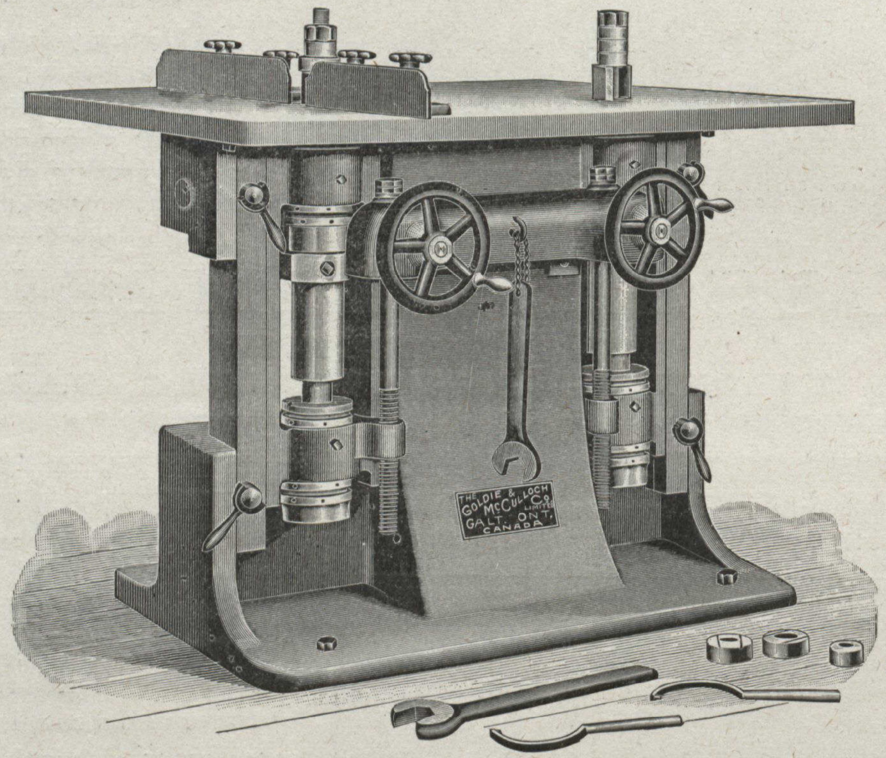

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Canadian Woodworker

A MONTHLY JOURNAL
FOR ALL CLASSES OF WOODWORKERS

Vol. 1 TORONTO, OCTOBER, 1908 No. 8

CANADIAN WOODWORKER

A Monthly Journal for all classes of Woodworkers.

Subscription: Canada, and Great Britain, $1.00 per year; United States and Foreign owing to postage $1.50, payable in advance. Advertising rates on application.

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BIGGAR-WILSON, Ltd., Publishers

Offices: 405-406 Confederation Life Building, Toronto, Ont. Telephone, Main 6377.

Canadian Woodworker is published by the first of the month. All changes for advertisements, news items and other matter must be in hand by the 15th of the preceding month. Cuts should be sent by mail, not by express.

Practical men are invited to send to the Editor signed articles or paragraphs upon any subject of interest to their fellow woodworkers.

WHY SHOULD CANADA IMPORT WOODENWARE?

Canada has such a high reputation for lumber resources and for the manufacturing possibilities which accrue from the possession of such, that it seems like an encouragement to carry coals to Newcastle to suggest exporting woodenware wholesale into this country. Of course, already we import quite a quantity of furniture from the United States, but our people have believed that this was a more or less temporary expedient which time would sooner or later convert into a movement in the contrary direction. Our American contemporary, "Veneers," speaking on this subject, says in a recent issue: "They have timber in Canada, but not so much in the way of cabinet woods, and they buy a fair amount of our veneers, which helps some, but it would probably help still more if American manufacturers would keep their veneers and make them up into furniture, doors and millwork to send to Canada." The matter of extending exports to Canada is broached because of the falling off in that branch of trade to Europe, somewhat in furniture and very considerably in the sash and door trade. In fact, in the latter line American exports to Europe are only half what they were five years ago.

Certainly there are several kinds of wood which we in Canada will have to continue importing, but, taken in the main, we have so many natural advantages for the manufacture of furniture and all kinds of planing mill products that suggestions for making Canada a market for heavy importations from the United States to relieve their domestic market do not fall on fertile soil.

PROMPTNESS IN DELIVERY.

"Be prompt in carrying out an order" is a splendid rule for woodworking establishments. In many cases promptness is a quality more valued than mere cheapness. At any rate, a reputation for promptness in turning out goods at short notice will often bring to a planing mill a class of customers who care more for that and for the dependence which they can place on the proprietor's word than for the saving of a few dollars through taking their work to a mill whose sense of the importance of time is deficient. A prospective builder is often a man who wants mill work in a hurry. If he can order it, and get it quickly and at the time promised, the mill is likely to receive further orders from him, and he will often not trouble about getting competitors' prices.

Even of more importance than the getting out of an order in quick time is to have it ready at the time promised, whether this be soon or late, to-day or to-morrow. Nothing can be more annoying to a customer than for goods promised, say, by Thursday, to be still unfinished on Friday. Failure to be strictly on time is apt to put other arrangements awry also, with the result that Mr. Customer, even if he does not say much at the time, makes a mental note to go somewhere else next time.

We have heard of planing mills which make a specialty of quick delivery. A load of lumber asked for by phone in the morning is delivered in the afternoon. A number of window sashes or door frames required to complete a dwelling-house ordered over night will be finished and delivered before the close of the following day. This idea of speed requires good, systematic management, and probably is a little expensive in carrying out, but it probably pays for the extra cost. But as to the profitableness of producing the goods just when promised, there is no question. It is an essential of this as of other businesses.

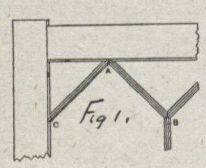
—At the recent Toronto Exhibition the Waterous Engine Works Co., Brantford, supplied a 9 x 10 McEwen engine to run the line shafting and the electric light. This engine ran continuously without stopping each day from 8 a.m. to 11 p.m., handling heavy load, without noise or vibration. The engine was simply fastened to the floor, and was not placed on any special foundation. They also exhibited one of their second size standard crane-neck steam fire engines, with patent boiler, this engine being the one built for the Corporation of Vancouver, B.C. They also exhibited one of their standard 15-ton double cylinder steam road rollers, these being three of their leading lines, in which they do a very large business.

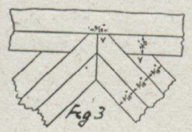
Planing and Molding

SASH WORK.

The making of "Queen Anne" sash or marginal light work, involves a few fundamental principles with which many men who work on sash are not familiar. It is the purpose of the writer to first give some examples with enlarged details of the several joints, and afterwards go more fully into the methods of procedure both in laying out the patterns on paper and in getting the work together.

The handling of marginal light work is of rather a delicate nature, as the bars are usually from ½ to 9-16-inch thick, varying as the tongue between the glass is ⅛-inch or thicker. In the figures used to illustrate this article, the





dimensions on the bars are given as 3-16 for the glass rabbets and 3-16 for the tongue of the bar. It is a fact that when the tongue is made thinner than 3-16 it is extremely difficult to brad them together in some of the joints without their splitting and spoiling the work.

It is scarcely necessary to state that these light bars must be made of a wood that will not split easily, but which may be cut smoothly across the grain. Of all the permissible woods northern white pine is the best, while certain kinds of soft cypress are a good second. It is possible to use the western or sugar pine for this purpose, but it is too apt to pull and break back a little from the cut of the knife.

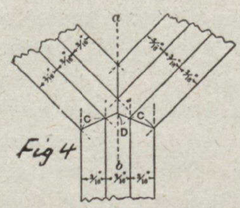
If there is any quantity of marginal light work to be done it will certainly pay to put in a sash trimmer of some kind even if one has to be improvised. The making of copes with a chisel by hand will be the means of putting out work of which the mill will be ashamed, and also consume so much time that there will be no profit left in the work.

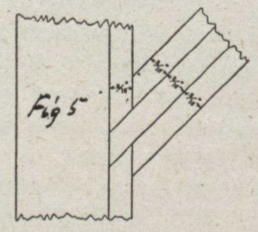
Fig. 1 shows the corner of a marginal light sash with three different classes of joints. As these are part of the fundamentals it will stand the workman in hand to get them properly in mind or he will be unable to make a working drawing of any sash. Of course, it is not necessary to make a working drawing of very many of the cut-up sashes except they are other than rectangular, but the spaces have to be laid out on the shash itself, which involves a knowledge of all the different joints.

The detail A in Fig. 1 is enlarged at Fig. 3, and shows two bars meeting at 90 degrees with each other and at 45 with the rail of the sash. The mitre cut between the bars is a straight saw cut and is made with a fine saw in a mitre-box. This cut leaves 3-32 of a square on the end of each bar as indicated by the two being 3-16 as shown in the detail. I may say here that all the sketches used show the glass or rabbet side of the sash, as this is the side the workman takes his measures for, and has always in sight while putting his work together. Wherever the rabbets intersect and the tongue runs over the other rabbet as at YY in detail A, see Fig. 3, it will be known that the sticking is coped over the other member on the face side of the work. This is what makes the job strong, having the tongue over the rabbet on one side and the cope over the sticking on the other. When the bars are fitted in snugly and bradded properly it is no easy matter to push the bars out of a sash. The horizontal cuts on the bars shown in Fig. 3 are copes and are made on the trimmer. In order to insure a smooth cut with the trimmer the bars should be cut up into lengths slightly longer than net so as to leave a little for the trimmer to take off. Usually this should not exceed ¼-inch.

The detail B of Fig. 1 is given in Fig. 4, and is the meeting of two angle bars over a mullion. All of the cuts in this joint are saw cuts. Nevertheless it is one of the most difficult for bench men to get through their heads. The real principle of the joint is to have the tongues and rabbets member at the miters. In order to do this the miter cut must be ½ the angle between the angle bar and the mullion. To get the cut for this in the miter-box it may be necessary to draw an accurate reproduction of detail B on a large scale, and this may be done by first erecting the perpendicular AB and on each side of it draw the bars as shown, letting the lines extend indefinitely as the dotted lines in the illustration. Now on each side of the perpendicular or centre line draw the mullon, having its members the same width as those in the bars already drawn. The intersections of the slanting and perpendicular lines when connected by straight lines will give the miter cuts as shown in the figure. This is a very pretty joint and one much used in this class of work, therefore it will pay to get the cut so that it will make a perfect miter from the start. It will also act as a check on the other joints, for if it is known to be cut right and still will not come to place, there must be something wrong with the spacing, or with the trimmer, for the bars will sometimes slip at the trimmer, but a joint sawed in a good miter-box will be the same every time.

Detail C (see Fig. 5) is one of the simplest of the series and is all made on the trimmer. It will be necessary to set the trimmer for each side separately, as there is always a mate to a joint like this. It must not be overlooked either that the angle is not always 45, but may be almost anything within the limits of a man's taste, but this means only to tip the bar more or less under the trimmer.



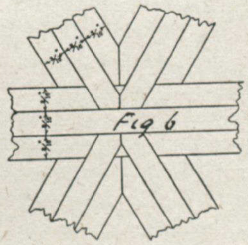


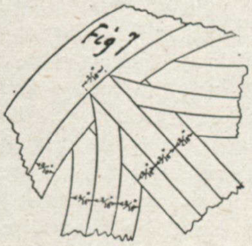
The above points, of course, generally speaking, are all matters of common knowledge to experts in sash work, but there are many who read this article who are beginners or who have never put up such a sash as it should be finished. The radius of the rabbet line of the sash proper is the same as that of the circular bar in order to secure a regular geometrical figure for the marginal lights.

Detail D, see Fig. 6, illustrates the joints at the middle of the sash where the six bars meet around a common centre.

It would be possible to saw this intersection entirely and nail or brad it together, but it would be agreed that such a joint would be liable to push out in the centre and wreck the whole thing. The detail shows one bar extending entirely across the sash and the others cutting against it on the same principle as the cuts in detail A, Fig. 3. This is not a difficult joint to lay out, as the bars form the sides of equilateral triangles and the miter cuts can be obtained by this means.

Detail E, Fig. 7, is a different and more difficult proposition on account of the long slant of the miter with the bar.





However, if the short-cut is made first to protect the slim end of the circular bar the trick may be successfully performed on the trimmer by putting an extra support under the bar to take some of the strain of the knife in cutting.

If the sash is too small to permit the bars to be sprung into place, it will be necessary to wait for the gluing up of the sash until the bars are fitted. By making the rim of the sash in three pieces, as shown in the figure, the joints will not interfere with the marginal light work, and by putting some temporary nails in the slips which hold the sash together the bars may all be fitted and the sash glued up after they are all in place.

GRINDING PLANER KNIVES.

One of the most important lessons learned in recent years is that the average automatic knife grinder has been operated at too high a speed. There has been particularly noticeable during the past year a tendency to materially reduce these knife grinder speeds so as to get better service out of the knives. In the old days we ground planer knives on grindstones, operating at very slow speeds and using water freely, and while now and then some man might get anxious to finish his work quickly and scorch the edge of his knife, there was not as much injury done to knives in grinding as is done to-day.

There was probably less complaint among woodworkers about the quality of knives, too, even though the knife-makers hadn't learned how to make as good a knife and temper it as well as they can now. It was with the coming of the emery wheel that the real knife troubles began, and sometimes it gave the emery wheel a black eye among some woodworking machinery people. The emery wheel, being small, was operated at high speed, and, being run at high speed, it cut freely and also scorched the metal. Some figured from this that it was practically impossible to grind on an emery wheel without doing injury to knives, but it is well known by those who are posted on the subject that a knife can be injured in grinding with either a grindstone or an emery wheel.

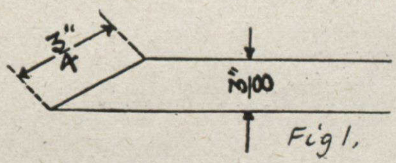
It was at first thought that even if operated with high speed that by cutting lightly with an emery wheel the temper of the knife could be spared just the same as with a grindstone, but it has been found that the best results have been obtained by reducing the speed of the wheel. So, to-day, the best authorities on the subject say that an emery wheel for knife grinding will do the better service by running at a rim speed of approximately 3,000 feet per minute. This about half of what we used to run the knife grinder, but it is probable that we will soon be running them slower yet.

The majority of knife grinders now are of the cup wheel type, and they may be had either for dry grinding or wet grinding. Wet grinding, that is, the use of water on a wheel, is the best for the temper of a knife, though it is possible, and some experienced users continue grinding knives with a dry wheel. Practically all agree, however, that the wheel should run slowly, and that the grinding should be done lightly. It doesn't matter much how long the knife is on the grinding machine, because it works automatically, and you can set the feed lightly and go ahead about your business. The main point the grinder has to look after, aside from the speed and the feed, is to get his knife set for the proper bevel to fit his machine and the work on hand.

Usually the knives are ground to as short a bevel as the work will permit (Fig. 1). What might be termed the average bevel is twice as long as the thickness of the knife, that is, a knife 3/8-inch thick will have a bevel of 3/4-inch from the point to the heel, measured on the face of the bevel. This, however, is just a sort of average basis to work from, and each man should vary from this according to his machine and his work.

The first point that he should look out for is that the heel of the knife will clear the face of the wood that it is dressing. If it doesn't, if the bevel is too short and the heel following after the cutting edge strikes the surface of the wood, it will cause the planer to make what is termed a howling noise, and, of course, the knives should be taken off and the bevel ground back a little further. In fact, the bevel should be ground back so that the heel will clear quite freely when the knife is freshly ground, because the knife is supposed to stand a whetting or two before going back to the grinder, and, if the edge is whetted off a little shorter, it brings the heel down closer. For soft, spongy wood it is frequently desirable to grind the bevel back further and make the point slim and keen.

That is why each man must study his own local conditions and experiment to determine what bevel is best for his special work. The hard woods usually take a knife with as short a bevel as can be run for the heel to clear the surface of the board. It is best in grinding, as stated heretofore, to grind with a little concave in the bevel to facilitate whetting, as it is rather difficult to whet a perfectly straight-ground bevel on a knife without dubbing it off with a short bevel at the point, thus making it run hard. The kind of concave to have, like the bevel, is best determined by a little experimenting, and it is easy with the cup wheel to get



whatever concave may be wanted as well as the exact bevel required.

There are three points about a planer that are regarded as important for the doing of smooth work. Some regard one as the most important and some another, depending on the peculiarities of the individual and the experiences that have been had with different machines. The three points are, first, careful balancing of knives and all running parts; second, the setting of the knives on the heads so that each knife will do its share of the work; third, the adjustment of pressure bars, chip breakers, and rollers in the bed.

The first of these, the careful balancing of the knives, should be attended to religiously every time they are removed and ground. Don't take it for granted that because you have ground away only a little of the knife and have ground it the same from end to end that you haven't changed its weight perceptibly, but weigh and balance each time. The ideal balance, of course, would be to have all four of the knives on a head exactly the same weight, but this is not essential. The one thing that is essential, however, is to have the knives balanced in pairs, that is, the knives that go opposite each other on the head must weigh exactly the same; also, the bolts and the washers used to hold them on should weigh the same.

There is a story related by a knife salesman on this point that contains a moral. He sold a set of knives to a box factory, and when they came to use them there was a complaint that the knives didn't run well, that they hadn't been balanced up or something. He went out into the factory and investigated and found that, while the knives had been carefully paired and balanced at the factory, the man in putting them on the planer had mixed the pairs. He had one out of each pair matched up with one of the other pair, so that when the knives were fitted on the cutter head they were out of balance. When the knives were properly fitted in pairs, however, they ran very smoothly.

The moral to this story contains a plain injunction to keep your knives marked up in pairs so that you can readily identify them, balance them in pairs, and put them on that way. And to balance these things means to do it nicely.

Fig 2.

Do not simply make a bluff at it and think that you have got it very nearly, and that's good enough. The speed of a planer cutter head is such that only a few ounces of weight could make a whole lot of trouble when it gets to going good, so that very delicate scales should be used for balancing and very careful attention given to see that they balance perfectly.

Setting planer knives on the head so that all four knives will cut just alike is a subject that has called forth a world of discussion during the past three years. And, incidentally, it has been developed out of this discussion that about the most delicate job in mechanical adjustment is to set four planer knives on a cylinder head so that every one will do its share of the work. There are some authorities on this subject who contend that it is absolutely impossible for any man with the best implements furnished to set four planer knives on a head so that all will cut alike. Each will do some work, but the finishing touches on the surface are usually made by some one knife extending just a little further out than the others. On the other hand, there are men who maintain that they can set them positively so they will cut all alike. It is a sufficiently difficult problem, however, that at least one well-known manufacturer of planing machines has brought out a machine which carries an appliance for jointing the knives off after they are set to the head.

After seeing one of these machines work and noting the difference in the surface of the stock after the knives have been jointed off while running as compared to ordinary dressed lumber where those precautions have not been taken, it is easy to believe that it is impossible to set all four knives alike. The machine that has had the knives jointed off after the knives have been set cuts absolutely smooth on the surface, shows no waves, and no planer marks whatever. This is a thing it is almost impossible to do in setting knives with the best of gauges. Generally there will show slight waves, but the more pains taken with the knives the less perceptible are these waves.

So that is a point that too much pains cannot be taken with. It is not sufficient to take an ordinary rule and measure from the lip of the cutter head and let the edge of the knife extend a certain distance. This may do for a start, to set all the knives on and bolt them down temporarily, but then the machine should be gone over and the knives carefully gauged by any one of the various methods in common practice for this purpose. Generally, the more care exercised in the gauging the better will be the work. Also, after you run the knives awhile and then whet them they should do smoother work. The knife extending the farthest and doing the heaviest cutting will naturally dull most, and in the course of whetting them down to an edge they are brought into more exact gauge. This is a strong argument in favor of keeping the knives on the machine and running them as long as possible before changing. Not that it is good to run them dull, but it is an argument in favor of using a concave in the bevel quite freely, so that knives can be repeatedly whetted and kept on the machinery for a little longer time than usual. They do better work and get trued up in the process of wearing and whetting so the operator should be reluctant to take them off until grinding becomes imperative.

Some day, possibly, we will have a new type of cutter-head or a grinding machine for sharpening, so that knives can be set on these heads and then ground to true face and edge right on the machine. Then the knife-setting problem will be solved, and it will be possible to get all four knives cutting alike, and to get lumber practically free from what are termed washboard planer marks Meantime, however, the price of smooth work at the planer is careful setting as outlined above.

Probably everybody operating a planer knows that the pressure-bar should come down firmly on stock its full width and hold it from shaking, but should not be tight enough to cause undue friction and make it difficult to feed the stock through. Also, it is pretty well known that the chip breaker should come down firmly in the same way, and should be as close as practical to the cutting point, but what many people seem to forget, overlook, or else have failed to learn, is that the adjustment of the bottom rollers in a planer bed are about as important as the adjustment of the pressure-bar and the chip breaker. To get the best results the rollers should be as low as possible, extending just enough above the bed to facilitate the feeding through the machine (Fig. 2). It would really be better, so far as the qualities of the work are concerned, if there were no rollers in the bottom bed and have the stuff feed through flat on the table.

This is not practical, however, because it is impossible to feed the stock through flat on the bed.

Within certain limits the higher the rollers, the higher the stuff is off the bed the easier it feeds. This makes a temptation for the planer men, especially if they have trouble feeding the stock through, to raise the bed rollers up until the stock rocks a little and makes wavy work at the end. About the best advice that can be offered is to keep letting the rollers down, and, of course, keep them in line with the bed, each end the same height in relation to the bed as the other, and let them down where the stuff drags on the bed until it takes a little oil now and then to make it feed through. If it gives too much trouble raise the rollers a little, but remember that the closer down you can keep the stuff to the bed the better you can do your work. Let your bed down now and then so that you can get under the cutter-head with a good steel straightedge and go over these bottom rollers carefully and see, not only whether any of them are extending up too high or not, but whether or not they are the same height at each end. They must be in tram as well as close down to the bed as practical to get good results. It is only by careful testing from time to time with a straight-edge that this can be assured.

THE PLANING MILL FOREMAN.

The foreman of a planing mill has always been known to have all the trouble he might be looking for, and a few extras thrown in for good measure. He always will be getting good measure in the future, at least until such time when he can take a No. 2 grade of flooring strips and turn out bang-up No. 1 D. and M. In many instances during the last fifty years the reserve has been the rule to a certain extent, and the man that could reduce this depreciation was usually set up as a "Crackerjack" planing mill man. But a hatful of "Thunderations!" and similar or worse adjectives are employed when some one discovers a single piece of flooring where the machine man "turned up" the wrong side.

Hindsight is often described as being much superior to foresight, and because every last and possible defect was not discovered at the machine and the best face, perhaps, not shown, this individual piece of flooring is made a sample of, and the foreman is then and there supposed to offer a satisfactory explanation—with apologies under his hat and tears in his throat—and, of course, see to it that such a thing will never happen again. The firm won't stand for it. They cannot throw good money away like that, and if he cannot run things right they will have to get somebody else that will, etc.

There are a thousand and one things that may cause as much dissatisfaction as an occurrence like the above, and with all this the foreman must remain unruffled, and know exactly what to do in every instance. Prompt decision and prompt action may often save the day. Of course, the firm don't want lumber spoiled in the mill and all that. Good machine work often helps to sell the finished product, and if a good reputation is once established the firm is especially anxious to keep it up. The foreman that realizes these facts and imagines himself in the boss's shoes for a little while will get along just so much the smoother. It is not so hard to understand what the boss wants. A good boss will appreciate the good efforts and good effects emanating from the mill, and when he gets a kick from the customer he is usually ready to inform that worthy that he has the best millman around, who invariably turns out a good job. If anything is wrong, it must be an extraordinary case, and needs looking up. Such a little talk usually goes a long way to straighten out many of the small kicks that pop up here and there, and oftentimes are quite unimportant.

The selling end of a business also has its troubles, and when good mill work helps the firm makes just so much better money. Experience shows that when the profit and loss account is fattening up, your requests for improvements and new machinery are granted more readily. If the foreman shows where additional equipment makes new money there is generally a prompt response to his suggestions.

I speak of these things in general, because they are so often overlooked by the management as well as the foreman. Friction and misunderstandings often arise from this identical cause. The foreman thinking, and too often talking, behind the manager's back about being stingy and foolishly shortsighted, often adding that if "they" don't care why should he bother his head about it. At about the same time the manager probably remarks that that mill foreman always wants new machinery, and that his repair expense is beyond all reason.

When things get to this stage your peace of mind is an undesirable commodity, and each party interested should observe that they are on the road to the "fireworks." Nobody makes money shooting off fireworks. Neither will you catch any flies with good or bad vinegar. Good molasses is far superior in this respect, and if common sense methods were used in those matters the axe would not need to be used nearly as frequently by those who are above us. There have been instances where enough bad blood was in sight to require the decapitation of both foreman and boss. Life is too short to be abiding in such a turmoil, and the wiser heads above us usually take this view and choose to make a clean sweep. Let us work together in brotherly love and peace and harmony with the boss, and each one will make more money and enjoy more of the other good things that come to those who have learned to labor and to wait.

Saws that won't "stand up" nor keep cool lose much of their meanness if the office knows you are doing your best. A planer needs new knives, and you so report without having any suspicious questions asked. Of course, you don't ask for them before it is necessary, for you know that one asking will bring them. Now you are doing business. There is a different air around such a planing mill. One can sniff this air of prosperity without going half through your mill, and the first thing you will know somebody else is making you inducements to take charge of a mill somewhere else that "needs a good man." Don't go too quick. Better have a little heart-to-heart talk with your people first. Probably they can afford to do as handsome by you as the other fellow.

You may think you made all the improvements possible at the old place, and you want a new field to expand in. Keep a sharp lookout and you will find constant opportunities for the application of your genius.

A new kink in filing even a common, ordinary ripsaw for some special work may come up to-day. To-morrow you may have a sticker job that requires more knives than you ever saw on a sticker "set up"—but you can do it, and your boss sees it all right, even if he does forget to speak of it at the time.

When the modern band resaws were first brought to Chicago there was some strong talk "in the mill." No other machine plays havoc in an old-time planing mill as does one of these machines. But the resaw came and stayed. These large band saws on them often snapped in two, and you were mighty lucky if you were out of their reach just at that time. Such a broken saw was invariably sent to a saw manufacturer in the city. The foreman asked the saw people to show him how to mend the "band" to save time sending the saws out each time. The information he got from this saw factory was a considerably minus quantity. To-day this man runs three such saws and mends all breaks. His wages have not been cut for fifteen years. He has a few boosts to his credit, and the man that takes him away needs some good money, and chances are other things would be taken into consideration very seriously before changes would be announced.

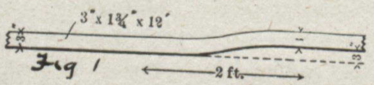
Opportunities, large and small, are lying around any and every planing mill, and the man that sees them is "the man of the hour" in the lumber world to-day. Not a narrow world either.

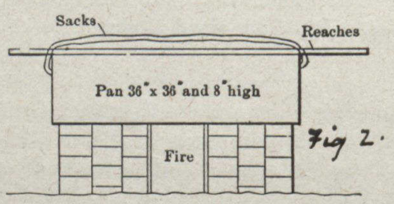
Ralph Sawdust.

WOOD BENDING.

The main theory in connection with wood bending is that it is a compressing process. Wood may have an appearance of elastic qualities, but there is really no stretch to it. There is tensile stretch it is true, quite a lot of it in some woods, but whenever you stretch a piece of wood that moment it is broken. There may be at least a fraction of give to it, but for all practical purposes we can say that it has absolutely no stretch. So when a piece of wood is bent, no matter which way or into what shape, any kind of a bend means that there must be shortening of the surface line of the wood on one side or a lengthening on the other. For to bend means to form a segment of a circle, and as is well known, the circumference of the inner segment of the circular piece is shorter than the outer surface in proportion to the thickness of the piece. Since wood cannot stretch when it is bent, it naturally must compress in some of its parts to make this difference in the lines otherwise there would be no bending. It is for the sake of this compressing that wood is generally prepared for bending by being steamed or boiled so as to render it soft and pliant. And this softness, this quality of ease in bending, which it gets through boiling or steaming, is by virtue of becoming more easily compressible.

With this fact held firmly in mind, it is easy to understand that the way to avoid breakage in the process of bending is to prevent stretch. That is why the outsides of all curves in the process of bending are, on modern appliances, protected with iron straps or bands so that the strain on the tensile strength of the wood necessary to compress it for bending may not break the outer part of the curved body. This is one thing that it is difficult for the incidental wood-





bender to do, that is, carefully protect the outside of his stock in bending with an iron strap, because he hasn't the regulation bending equipment. It is well, however, to keep it in mind and to strive wherever practical to give protection and reinforcement to the outside or at least have stops to the ends of the stick to prevent any chance for it to lengthen.

Another difficult thing in many instances is to get the wood properly steamed or boiled before bending, especially if it is a long piece of wood and only a short section of it, and that possibly in the middle, is to be bent. For example, take a case of a number of 1¾ by 3 inches by 12 feet second growth hickory reaches which it is desired to bend the 3-inch way, making the bend in 2 feet of length, and that 2 feet instead of being at either end being some distance from the end. (See Fig. 1.)

In the way of equipment, suppose you had a square iron pan 36 by 36 inches, and 8 inches deep under which you could build a fire and boil from 4 to 6 inches of water. One figures that he could lay the reaches along the top edge of this pan, exposing 36 inches in length for the 24 inches to be bent, to the steam arising from this boiling water. He couldn't, of course, get the shaft material down into the water because of the bend not being at either end, as may be understood by reference to Fig. 2, but he thought by laying them on top of this water and wrapping them with burlap sacks or something of the kind to help retain the moisture of the steam and then covering over the top of these with a sheet of tin the size of the vat would also help hold the heat and the moisture. He asked if it would improve matters to wrap the reaches with these sacks and soak them with water about 24 hours before steaming and how long they should be steamed in this manner before ready to bend. Also he asked if it would be necessary to bend them any beyond the specified amount to allow for a possible straightening out. And also as to how long they should remain in the bending frame after being bent, if left on the shop floor to dry, but without any application of heat. To this the following answer is made:—

"You can manage to bend the hickory by steaming it in the manner suggested. It is a little difficult to tell you just how long you should steam it, as much depends on the amount of fire and the steam and heat generated. The slight bend you mention would require steaming probably only two or three hours to bend readily, as soon as they are steamed enough to be warmed clear through. It would be advisable to bend them a little beyond the curve that is wanted, because there is always a tendency to spring a little and if you bend them too much it is very easy to force them back a little. After bending them, if you could get heat to them some way and bake them a while so that they will dry out all through they will stay in shape better and can be taken out of the form sooner. If you have a fire anywhere in the shop you can try and keep them around the fire so that they will get a little heat. In practically all shaft bending, the shafts are bent over hollow iron forms with steam inside, which dries them out rapidly and bakes the wood so that they can be released in a few hours. While letting them stand for a long time, two or three weeks, as you say, it is not imperative to have them baking, but it does take some heat to drive out all the moisture and I would suggest that after they stand for a week or two and before you are ready to release them from the form you try to arrange some means to subject them to heat enough to drive out all the surplus moisture."

What bent wood needs is rapid drying with plenty of heat and to have this heat applied until it has reached practically the baking stage, to dry it thoroughly and make it retain its shape. Sometimes with incidental pieces this can be done around the shop fire with a stove and done practically as well, though more tedious, than the same work is accomplished where lots of bending is done and the wood is bent over hollow iron forms, heated with steam, and left there to dry out. If there are overhead joists or something of that kind to hang them to above the forge fire, or above the stove, it helps considerably, but it is seldom satisfactory to bend a piece of wood and let it set simply by seasoning in the open air, though you have plenty of time to give it, because while it may in time thoroughly dry out, it doesn't get the same effect as comes from baking or what might be termed kiln-dried, applying heat sufficiently to kill or deaden some of the elastic tendencies of the wood.

So keep this matter of the advantage of kiln-drying or heating in mind and provide for it with whatever means you may have at hand. If there is a dry kiln you can put them in, well and good. If there is a steam boiler that you can put them on, it serves very well, and if there is neither of these there is always a chance to let them get this heat around or hanging over a shop stove or heater and it takes something of this kind to put the finishing touches on all kinds of bent work, unless it is something that is held in shape by other things after being put in use and isn't required to retain its shape of its own volition.

Saw Mill Department

CARE OF THE RIPSAW.

The man that understands all about a ripsaw seldom puts in all his time running one, for by that time he is frequently qualified for what is regarded a higher place. But if a man understanding all about one does continue to operate it, and does his duty right, he will find a number of things to give attention to aside from that of seeing how rapidly he can handle stock to and from his machine.

The first thing his attention is turned to, when once centred on the ripsaw itself, is the filing and setting of the teeth. Here there are and probably always will be different ideas both as to the thickness of the saw and the methods of setting and filing. Some prefer a thick saw and a swage tooth, with good corners on both sides; others take a thin saw and spring set the teeth, and some do a little swaging and a little springing.

It is a peculiar fact in this connection that generally the advocates of the thin saw give preference to the spring set, while the users of the thicker saws almost universally depend on the swage set. For heavy service there is no question but that the thick saw and the swage set is the best. Also, broadly speaking, the swaged tooth is the ideal tooth for ripping, and the spring set tooth is simply a makeshift. There are, however, certain conditions that arise now and then that make it valuable to use a saw with keen, sharp corners in preference to the square, chisel-like tooth of the swage set saw. Sometimes, on extremely thin lumber and on veneer, where the chisel-like tooth tends to do a little splintering, the spring set with its briar-corner does the work more neatly. Also, it works better on three-ply veneer, where the saw cut is crosswise of the grain of one or two plies of the wood. In fact, for this class of work the saws are set and filed more like crosscuts than like a ripsaw for the sake of getting the keen corners. But they will not stand the feed nor cut as rapidly as the regulation ripsaw for cutting straight in solid wood. For ripping lumber of standard thickness or resawed once a ripsaw of moderate thickness, neatly swaged, gives the best results and will generally run longer.

One great trouble with spring setting the teeth of a saw is that it is impossible to do the springing at the point only; you must spring a little of the body of the tooth. Then, when the tooth gets to work it wears most rapidly right on the outer corner, where the tooth body is thin and keen, until eventually the saw tooth shows wider back of the corner than it does right at the point. This makes the saw pull heavy and run badly, as every experienced sawyer knows, and it is one of the great difficulties attending the use of the spring set. So, if one is inclined to give preference to the spring set there are certain precautions to be taken on this point. The first one of them is not to spring any more of the body of the tooth than is positively necessary to get it to set. It were better to use a hammer in setting the point over, so that it can be set over sharply right at the point instead of wrenching it over with an old-fashioned spring set, which is inclined to bend the tooth gradually from nearly half way to the back. Some of this same precaution can be taken with the modern spring sets by adjusting the die so as to bend only far enough down to get a sufficient set. After having by experiments obtained your bending for the spring set at the proper place near the point of the tooth, another way to guard somewhat against the corner wearing round is to use the swage lightly in addition to springing. That is, spring the teeth once, and the next time you file swage them lightly, which expands the point at the edge so that it will fill out what has worn away. Then, by filing down, you have a fairly good tooth.

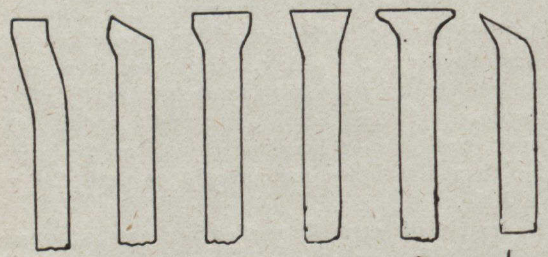
It must be remembered in filing ripsaws that when you spring set or use half spring and half swage you are getting only half as many corners as if you use full swage. In cutting spongy wood, it becomes necessary, therefore, to make your set a little wider than would be necessary in using the swage set tooth, because, having only half the number of corners, it will not cut its kerf so clean. Wherever practical try to use the swage set, and where the work is heavy make the corners heavy, and where it is light, and keen corners are wanted, rather than strong corners, you can make the corners light by proper sidefiling so that they are always the same as the spring set corner, with the exception that you have one on each side of the tooth instead of only on one side. When a saw is swaged for heavy corners, there is some tendency for these corners to get round after running a while, just the same as a spring set, and this should be remedied in one of two ways, depending on the condition of the saw. If the set is wider than necessary, one may side-file the tooth at the next filing, doing most of the side-filing on the back part of the swaged corner, and thus leave the front the widest. If the set is rather light, it is better to go over the teeth at each filing lightly with a swage and spread them again right at the point. Then, if the corners swell out back of the point from the spreading side, file them until they are straight or until the back is under a little.

The amount of set really needed in a saw is just enough to clear the blade so that it will run free without binding the metal as it passes or without heating the saw. That's what set is for, nothing else, to clear the blade of the saw, but the amount required depends at times on several different things. On green lumber or spongy lumber of almost any kind it takes more set than dry, hard lumber, because the corners of the teeth do not cut clean and there is more or less wooly fibre hangs to produce friction against the blade. If the saw is crooked or has lumps in it, it takes more than if it is perfectly straight, and if the saw is not properly aligned with the fence or gauge it takes more set, but in this case, instead of giving more set to the saw, it is much better to properly align it.

These and other similar influences are pretty generally taken into consideration, but there is another one which is sometimes lost sight of, and that is that the amount of the saw body engaged in the cut has a direct effect on the amount of set required to clear it. One might put up some pretty good logical argument on the ground that if the saw-blade is the same thickness all over, the set in the teeth, that would clear a fraction of the saw body, would clear all of it just the same. The trouble with this logic is that it doesn't take into consideration the fact that the larger the body of metal in a circular saw, or any other for that matter, the more difficult it is to keep it running true while in operation. A little heat will generate at the eye and cause dishing and the pull on the rim from the cutting strain may expand the rim a little and cause snaking, and there is enough of these influences present on nearly any saw at work to have some effect.

The lesson to learn from all the above is that the less saw you have in the cut the closer set you can run and the easier it is generally to do the work. Where one is cutting the same thickness right along it is better to have saws that are as small as possible for the work on hand, taking into due consideration, of course, the wear, and making allowance for that. Where the thickness of stock varies from time to time, it is essential to have a saw large enough to take in the thickest stock to be ripped; then there should be provided means for raising or lowering either the saw or the table so that the sawyer need not keep any more saw body extending above the table than is necessary to do the work on hand.

It not only makes it better on the saw itself, but there is less danger for the operator. This may sound like drawing the lines pretty fine in the operation of saws, but it is a good point that is too frequently overlooked. It is one of the things that serve to make the band saw of such pronounced success in competition with the circular saw in cutting lumber. Of course, there enters the matter of saw kerf, but it was found, too, that a part of the secret of success was due to the fact that there was not so much saw body involved in the cut. That is, clearance did not have to be provided for so much blade; consequently, the band saw could be run on a much closer set, thus contributing materially to economy in kerf. The amount of a 10-inch band saw in a cut, say, 12 inches deep, is less than one square foot of surface, whereas the amount of circle saw



1 2. 3. 4 5. 6.

under the conditions prevailing in the average sawmill would be frequently more than three square feet. This same thing has led to the use of band saws in ripping among planing mills and other woodworking industries which are called on now and then to rip heavy stock. And it and other causes may eventually lead to a more extensive use of band saws for ripping in the box factory. This, however, is entirely aside from the subject in hand, except that it serves to help impress the importance of having only as much saw engaged in the work as is absolutely necessary.

In the shaping of ripsaw teeth there is found about as many different styles or patterns of teeth as it is possible to make. In other words, all the changes possible to ring in on the metal involved in the saw teeth may be found by visiting different factories and viewing the work of different filers. Some look like shoe-pegs and others look like parrot-bills, and between the two there are many different intermediate varieties. There has never been established what might be called a standard shape of ripsaw teeth, partly because it is impracticable, and partly because different filers never agree. It is impractical, that is, to give a general shape, because the shape varies with the size of the saw and the number of teeth. It must vary some arbitrarily. The one thing that all authorities agree on, however, is that people should avoid square gullets, avoid filing the front of the tooth so that there is a square corner down in the gullet. It is claimed by saw-makers that this induces cracks. Whether it does or not, it is a bad practice, and when a tooth is worn until it cannot be properly filed without making a square gullet it is time to take it to an emery and grind out the throat. The better plan of all, however, is to file your factory ripsaws on an automatic sharpener, just like people file saws in big sawmills. In some of the larger and up-to-date box factories this practice already prevails, and it should be a part of every box factory filing-room where there are a dozen or more saws to file. It saves time for the saw-filer, and it ensures keeping the teeth the right shape and the saws in better balance, and it is thoroughly in keeping with modern progress generally. There are special automatic filers made for factory saws which cost less money than the larger ones, and are not so expensive, but what any box factory doing enough business to amount to anything can afford to buy one. It doesn't matter even if the filer has got time, he can better employ the time at something else—grinding knives or other more useful employment.

The time is past for filing up quantities of saws in the old-fashioned laborious way. It can be done cheaper and better with an automatic machine, and one of the best pieces of advice that can be given in connection with the maintenance of ripsaws for the box factory is to get an automatic sharpener.

In the illustrations, which are reproduced from "Packages," figure No. 1 shows a typical spring set that reaches too far down the tooth. It can be improved some by a little swaging. No. 2 shows how the corners wear off at the point. This tooth must be filed square before it can be swaged. No. 3 is a heavily swaged and squarely sided filed tooth. No. 4 shows a swaged tooth that has been side-filed "under" to make the corners light and keen. No. 5 shows that even swaged corners can wear round. This tooth needs side-filing. No. 6 is a type of keen-cornered tooth for cutting three-ply veneer stock.

OUR CIRCULAR.

By A. M. St. Cyr.

If asked what is the matter with your circular you would likely answer, "everything is the matter." It has lost the inspiring "ring" that used to thrill the sawyer and inspire the men. It has grown sulky and malicious, spoils many a board from the best part of the log, and every three lines the carriage runner is setting the guide pins. Old Mossback came over last week and "filed lead" in the teeth. The effect was universal, it led every way but straight ahead.

As a parting suggestion Mossback prescribed a new saw. His visit, however, did some good, for it taught us that long before it is time to file lead into a saw it is time to do something else. The book of instructions that came with the saw is very full of vague instructions, none of which fit our case. As the saw hangs there slightly lopped against the guide pins it is trying to tell us that we have been doctoring symptoms and not the disease.

Disregarding all fine spun theories, we go straight to the true point. The saw before us is but a disc of fine steel, sixty inches in diameter, its periphery formed into thirty chisels to cut its way through the log. As an obvious corollary the nearer they are like perfect chisels the better will they do their work. The portion between the collars and teeth is but a support for the teeth under the terrible strain of cutting through twelve inches of solid wood. The form, spacing and spread of the teeth are reserved for another article. For the present we will confine ourselves to the treatment of the main lesson in our saw. Just the reverse of what occurs to a wheel that renders "setting" the tire necessary has afflicted the saw.

The strain of running slightly expanded the rim; it began to lead in and heated the rim. It cut a beveled board and told its trouble in a sullen boom of protest as it left the log. We cooled it down, but it never quite returned to its original dimension. While the "ark was building" someone called that condition "rimbound." We know now that the word is misleading, but we have never had time to change old terms. We cannot shrink the rim as a smith "sets a tire," but can expand the inner portion to fill out the rim.

Right here, I may say that you will never be a sportsman till you can shoot "off hand." You will never be a good filer and hammerer till you can tell by a simple inspection what a saw needs, can file a tooth square without a guide and can swage one tooth just like another with the old time upset swage.

The best test is the simplest. Stand the saw upright on a plank, grasp it firmly with the hands about eighteen inches apart and give it a sudden jerk. Both the teeth and the eye will vibrate like a tense cord. If vibration ceases first at the eye it must be hammered, and here you must learn "off hand" to tell by the vibrations how much it is out of tension. While you are testing, roll it forward and test successively in each quadrant. You will likely find that some parts are more loose than others, that parts of the rim "flop," while others are almost rigid; the loss of tension has not been uniform.

Absurd as it may seem, the harder work the saw has to do the more limber it must be.

On the inference that you will speed to 10,000 feet tooth velocity and not over three-inch feed, proceed as follows:—

At a distance of one foot from the centre of the eye strike a circle; six inches farther out strike another. Draw a line from each tooth toward the centre barely crossing the outer line, and from every third tooth crossing the inner line. Mark off both sides of the saw in the same way, being careful that the marks are precisely opposite each other. As a regular tension hammer costs no more than any other see that you have one.

Now, lay the saw on a perfectly true anvil with "log side" up; and now be careful, as the chances are that you will hammer too much. At each place where lines cross strike one blow with the hammer. Do not look for dents or marks of the hammer. You must not make dents.

When you have gone around both circles stand the saw up as in the first test. You will be surprised to find that the "floppy" places are gone while the eye will tremble like a fiddle string. You note that the saw is not quite tensioned and that the log side is slightly concave, but this is as it should be, the saw is coming all right. Now, lay it on the anvil, board side up and go over it again, doing as nearly as possible one-half the hammering you did before. Now give the "shake" test and you will find it all right, and the log side perfectly true. Given the proper lead into the log it will cut a true line, stand up to its work and ring like a bell. You who have been accustomed to saws pock-marked with hammer marks wonder why you can see no marks.

The tension hammer has done all it can do long before it "dents" the saw.

In the near future I shall tell you how to dress the teeth for best results.

SPEED OF SAWS.

We all know there is a great difference of opinion among filers as to speed. Some claim that saws will crack if the speed is high; others claim the speed of the saw has nothing to do with the saw cracking. Centrifugal force does not enter into the problem of band saws as it does in circular saws, nor does the speed of the band saw have anything to do with cracking or the tensioning of the saws, although the speed of the band has much to do with the working of the saws, also with the life of the saws, as a band improperly speeded will have a tendency to induce cracks.

It is impossible for a saw of any kind to do good work under heavy feed if it hasn't proper speed. In cutting timber, such as ash, oak, maple or birch, a speed of about 8,500 feet per minute is sufficient, although the writer has run as high as 9,000 feet per minute with the very best results. For saws that cut practically all kinds of timber, wet or dry, a speed of about 8,932 feet per minute is safe to tie to; it will be found that the saw will run much easier than at less speed.

The writer recently visited several mills, and among them found only one mill that had what I would call the proper speed. The saws in this mill ran 8,000 feet per minute, doing nice work in hard maple logs. In the other mills the saws ran only about 6,500 feet, and were doing very poor work in hemlock logs. I will not say the speed of the saws in some of the mills is the cause of the poor work, for they had neither the proper hook nor throat-room to chamber the sawdust, and hook and the shape of the teeth and throat have as much to do with the work of the saws as does the speed. If the throat is very small, it will fill up with sawdust and cause the saw to heat, and then the saw is bound to be forced out of its line when in the cut. I have found a great many instances where persons in charge of band saws pay no regard to the shape of the teeth or the throat; some get the teeth into all kinds of shapes but the right one. Many saws break and do poor work on account of the shape of teeth and throat.

Some filers claim that a speed of about 6,506 is best for cutting all kinds of timber. Others say a low speed will cut the evenest lumber. This may be true where, say, only 20,000 feet are cut per day, but what would a low-speed saw do in a mill where, say, 70,000 feet are cut in ten hours? If one should undertake to saw this much lumber with a saw having low speed, the saw would be all over the log. One thing certain is, where the feed is strong the saw must have plenty of speed; if not, there will be trouble, either in the saw cracking or in making very poor lumber, and sometimes both.

Some sawmakers claim that saws will crack and run off the wheels if run at too high a speed, and say they then get the blame. There are cases where the sawmakers are to blame, also cases where the filer at the mill is to blame for the saws cracking. I never blame the sawmakers when a saw commences to crack until I am sure that they are to blame.

STRAIN ON A BAND-SAW BLADE.

Saw blades will usually stand more feed, saw straighter lines and maintain their position on the wheels better if the front is slightly shorter than the back, so that the strain placed upon the saw by the straining device tends to put the front edge under a slightly heavier strain than the back. The reason for this is that the front edge, the one that does the work, has some strain thrown on it by the power required to pull it through the cut and this is compensated for by the front being slightly shorter.

But when dust, slivers or other substances get between wheel and blade, the straining device has to compensate for this strain and do it quickly, else the result would be disastrous. To be effective, a straining device must be sensitive and the most sensitive device is that one which has no friction to retard its instant movement. It should be designed to be entirely without friction of any sort, and with no slow moving frame or heavy bodies to work against. When the force is exerted in straight lines direct from weight to fulcrum—from fulcrum to upper bearings, the movement of the straining device is instantaneous. There is nothing to retard its instant response.

EXHAUST FANS FOR SAW MILLS.

In many mills no doubt a considerable saving can be effected by means of a properly designed and arranged pneumatic plant for collecting sawdust, shavings, etc., and delivering it directly to the stokehold without hand labor. In arranging a plant each case should, of course, be judged on its merits, but to secure success the following points should always be borne in mind:—

(1) Put in a fan of ample power. (2) Run it at the correct and most effective speed. (3) Fix it as centrally as possible to the chief machines. (4) Have the main outlet pipe the same diameter as the fan outlet. (5) Give the branches to the machines long, easy curves in the direction of the current, and fit stop-gates in them. (6) The combined area of the branch pipes should not exceed that of the main pipe. (7) Fit the hoods and covers to the various machines as tightly as possible.

BAND SAW FOR CUTTING HEAVY TWISTED FORMS.

For cutting heavy, curvilinear, bevelled, or twisted forms, the best plan with which we are acquainted is to give the main column itself, which carries the saw wheels, a canting or axial motion. This can readily be done by fitting a toothed quadrant—operated by a worm and hand-wheel—on the back of the column itself. With this arrangement, the table carrying the wood is always kept level, and the saw guides do not require altering, as the radial motion, or axle, of the standard remains constant. With this arrangement the cutting angle of the saw can be readily varied as required. This form of machine is particularly useful in cutting out the ribs for ships and other twisted forms.

—Don't expect a swaged tooth-saw to do as good, clean work when merely rubbed off with a side file as it will do if properly dressed with a bevel to the tooth from the sides as well as from the point. This is especially true in the winter when green or wet lumber, partly frozen, may have to be ripped. A blunt tooth will not clear in frozen lumber, any more on small saws than it will on a log-saw, for, in proportion to size, the small saw often does more work than does the large one, sizes considered. Give the small saws a chance.

—That form of a saw which permits of its use as either a rip or cross-cut has its imitators where the original cannot be gotten. One filer makes one of his rips with a bevel to the front of the teeth and every fifth tooth is filed straight without any set and jointed slightly lower than the other teeth, just as a cross-cut-log saw is fitted. It makes a fairly good cut-off, but as rip it will not stand the feed the saws filed square across the fronts will carry.

UTILIZATION OF SAWDUST.

If there is any one thing which used to be an offence in America, and is so still in many places, it is sawdust—by which is understood not merely what dwellers in the great cities are accustomed to call "sawdust," but also the quarter-inch-wide chips ripped out of the saw logs by the 6-foot inserted teeth circular saws of the present day. Cremation piles and cremation furnaces have been used to get rid of them, for in some States it became necessary to pass laws preventing clogging the streams with the sawdust and other waste from the lumber mills. More recently, however, there have been introduced various methods of utilizing rather than destroying the material. One of these is making briquettes thereof. In this the Germans, with whom sawdust is not yet exactly a waste product to such an extent as to be an object of destruction and legislation, are particularly adept. The German briquettes everything on which he can lay his hands; even grinds up good coal and compresses it; and he makes briquettes not only out of combustible refuse, such as hemp and flax waste, and even the beet slices from the beet-sugar factories, but also out of incombustible materials, such as ore. As a rule no combining material is employed. The briquetting is done on the same plan as that employed by the Irishmen in playing the fiddle—main strength. There is supposed to be in the ordinary pine sawdust enough resin to hold the wood together if it is given a good chance.

Starting with the fresh material, which contains as a rule about 35 per cent. of its weight of water, the sawdust is conveyed by a suitable conveyor—in this case a spiral, although the writer would prefer a belt—to the drying plant. The conveyor trough is steam-heated. In the drying plant the amount of free water is reduced to about 12 per cent., and the heat here is so great that the resin is liquefied, and it is this which is used for the "bond." Of course, pine, fir, and similar soft woods are better suited for briquetting than hard woods or others which contain less resin.

Over the briquetting press there is a supplementary drying apparatus with double bottom, over which the sawdust is carried along to the double-walled hopper of the press, the hopper being similarly steam-heated. Of course, the resin must never be allowed to get solid once it has been melted, or at least made soft. The press is of the ordinary toggle type, makes 25 strokes a minute, and turns out half-pound blocks, so that in a day the output will be about 12,000 to 14,000 briquettes, weighing in all about 3 to 3½ tons.

The machinery, with supplementary dryer, double-walled hopper, and the internal piping, weighs about eight tons and costs in Germany about £300 unmounted, delivered at the shop. Foundations, countershaft and mounting are not included in this price. The main drying apparatus costs f.o.b. about £100, and uses about 90 pounds of steam per hour at 30 pounds boiler pressure. The power required for main dryer, supplementary, and press is about 16 horse-power.—Timber Trades Journal.

—The sawmills on Vancouver Island are becoming more active. The Red Fir Lumber Co., of Nanaimo, has a contract to supply 900,000 feet to the C.P.R. and other mills are also receiving good orders.

Furniture and Cabinet Making

THE MONEY IN GLUE STOCK.*

By Friman Kahrs.

It is often the case that the entire output of a factory is contracted away at one price—so much a pound for the whole lot. Under such contracts all the boilings bring the same price, as if they were one grade. If it is a cheap bone glue, and I shall use this kind for illustration, as it occurs so often, the contract price may be around 6 cents a pound.

As the dealer gets the samples of the boilings he grades them and finds that some of them are 2 or 3 cents higher in value than others. If we estimate the selling expense at 1 cent a pound on this cheap glue, the grading alone will bring the whole selling expense and a goodly portion of the legitimate profit to which the dealer must look in order to be paid for his time and his efforts.

Should the gluemaker, on the other hand, choose to dispose of his own output, it would under the business policy here outlined cost him less time and less money to sell his glue, while he could reap the present profit, which means a larger net revenue.

Improved Output.

And the mere price difference would not be a fair measure of the increased revenue, either. Where all is sold at, say, 6 cents a pound, there is no special inducement to improve the quality of the output. But if better lots fetch up to 9 cents, instead of 6 cents, then it pays to search for 9-cent lots. The stock is thenceforth somewhat selected, more of the good stock is found, the gluemaking is better looked after and the result is a considerable increase in the quantity of these 9-cent boilings and other boilings above the low-water mark.

Where the output of the factory is sold at prices fixed for different grades some grading is done at the factory, but present methods do not give adequate figures for the establishment of real glue values and there are frequent disputes between maker and dealer. If a better glue grading system is adopted disputes about glue values can easily be settled and each boiling be priced on the basis of what it contains. Then the manufacturer will be paid according to what he produces all the time, and this will be a powerful lever toward better glues and more profit.

The prices for common glue in barrel lots have for years been regulated according to the list of grades from 1¼ down to No. 2, usually with a step of 1 cent from grade to grade. Large consumers buy from 10 to 15 per cent. below list, while barrel lots may fetch 1 or 2 cents a pound above list, making a total difference of perhaps 3 cents a pound on lower grades over any upset price for factory output.

If the gluemaker retails his own glue this will be his reward.

Under present conditions the selling expenses would take the larger portion of this profit, but if a better grading system and the business policy here outlined are followed the selling expenses need not worry you. A considerable and growing number of consumers desire now to buy glues sold under guaranteed grade figures, and they are willing to give preference to glues sold that way.

The adoption of such a policy will therefore increase the value of the glue so offered. The consumers can well afford to pay more for such glue. They know it, and it can be proven in figures that it will cut their glue bills down from 20 to 30 per cent. if they buy such glue. So, even at 1 cent a pound more, the glue sold under a guaranteed working figure is cheaper than similar glue sold on talk only.

Then there is a large volume of trade buying glue in lots of less than a barrel, and this trade pays any profit you might dream of. Two instances will illustrate it. A cabinetmaker went to the store for glue. From the shelf came a box labelled, "Ground glue, warranted pure, 35 cents a pound."

And the grade was just your own cheap bone glue, which you contracted away at 6 cents a pound. Another case: A stairbuilder in a small town wanted 1¼ glue—he had heard about that kind—and bought in the nearest city 20 pounds at 20 cents a pound. And there again was your 6-cent bone glue.

These instances can be multiplied at will anywhere, and from the large number of small shops and mechanics who need glue you can easily get some idea of the big field there is for the retailing of a guaranteed article sold at an extra profit just on account of the guarantee.

The increasing demand for glue in other lines than the woodworking grades has developed a market for adhesives made from glue and other substances.

In these compounds the animal glue forms the basis, the other parts being added in order to modify the glue. For some compounds your 6-cent bone glue, made from tank liquors, is exceptionally well adapted. Others require the lower grades of hide glue and others again the highest glue grades made.

If you are after profit, this is your best field. The price you will get for your glue if you sell it as a compound is far above what it will yield at retail.

The demand for these compounds is steadily increasing. There are several large fields well worth attention. But caution is required if you want to go into this line of work. It will not be prudent to start such manufacturing unless you have tried formulæ. The wants of the trade require careful investigation and sometimes special machinery and special processes must be used in order to make a good article.

If glue—the finished product—cannot be gauged in value it is easily understood that it is still more difficult to guess what there is in the glue stock. And that is why we have heard so little about improvements in the handling and the curing of the product.

There are many chances here for making more profit than at present. Careful treatment from the start and sorting out the different kinds, these are the first steps. Next come changes in the curing process and the use of machinery designed for such work.

If these are developed it will be only one short step more, and you will have a half-finished product for which there is a

* Read at the Memphis meeting of the Tight Staves Con vention, Memphis, Tenn.

market in several industries and at prices far above the present rates for glue stock.

What applies to the stock applies also to the extraction of the stock and the making of glue. With glue valuation established on a different basis and with better glue stock and more of it the making of glue must be improved.

MAHOGANY AS A FURNITURE WOOD.

A few of the characteristics of mahogany as a wood, along with its special adaptability as an aid to constructive and decorative art, may be of interest. It is a wood which is undoubtedly the premier product of the tropical forest, and its economic utility is so wide that justice cannot be done to the subject. The object must necessarily be to lay before the uninitiated a few primary facts rather than to teach the expert, says "Timber News," and the order in which the facts are set forth is not meant to imply that they are in their proper sequence; and it also is possible that important considerations may even be omitted.

To the connoisseur mahogany possesses a beauty of appearance when of fine color and rightly figured, but extreme color becomes a blemish, especially if the texture is not good. Another important and almost unique feature is that this wood, with age, mellows in appearance and attains a bloom of color not evident when newly wrought. Possibly, with the exception of oak, it is the only wood possessing this trait. Rosewood and Padouk, when made up and newly polished, have a charming appearance, but with age the color fades, and the wood assumes a listless or dead appearance. Whether to place figure in mahogany before its color is a point upon which experts may differ, but either in itself makes a log valuable; but whilst nature is prolific, it is seldom that the combination of figure, color and texture is found in one log. Where these three factors are blended they form a beauty much to be admired, and give a value to a log ranging from 60c. to $7.20 per foot, whilst the cargo average may only be from 8c. to 12c. It will be understood that where logs realize the high prices stated they are used in veneer form, whilst the cheaper wood is used in the solid. Plain mahogany has a utility peculiarly its own, and its uses are almost illimitable; for ordinary furniture and for painting and enameling it is without a compeer.

Whilst the uses of many fancy woods are limited by their small sizes, mahogany stands out as a wood giving either extreme length or width, or both combined; hence for signs, facia boards, countertops and panels for raildway carriages, it is unrivaled. Sometimes it is of hard texture, and in other cases of a mellow nature, making it suitable for carriage panels. Then mahogany, even when figured, does not possess that alternate hardness and softness of grain characteristic of many woods, which makes it so difficult to obtain an even surface on them in highly-finished work. Some woods, whose initial cost may be low-priced, yet in their manipulation, after all the care possible has been spent upon them, show a ridgy face and lack a fine, even surface, owing to their absorbent nature and uneven fibre; they will not compare in beauty even with an ordinary grade of mahogany.

The great desideratum in high-class wood work, if the cost of the labor is to be justified, is to use a wood which when wrought will stand—that is, neither warp, twist or shrink. Many fancy woods, even when reasonably seasoned, have these failings, but in mahogany they are absent in a marked degree; it can also be readily seasoned. Of all the furniture woods available, if we except the few specially-figured logs, the average cost of mahogany is lower than that of many of its rivals; it is also less wasteful in conversion.

The first mention of mahogany occurs shortly after the discovery of America, when Cortez, between the years 1521 and 1540, employed in the construction of the ships used for prosecuting his voyages of discovery. After the conquest of Mexico, Sir Walter Raleigh, in 1527, used it for repairing his vessels. Captain Dampier mentions it in 1681, but called it "cedrela." In St. Pierre's "Studies of Nature" it is stated that mahogany grows on the shores of the Antilles. Catesby's "Natural History," 1754, speaks of the excellence of mahogany for all purposes. As to its first introduction into this country, some doubt appears to exist, and it is claimed by a firm of cabinetmakers that their predecessors, Messrs. Gillow, imported a cargo during the reign of Charles I, who died in 1649; this, however, clashes with the account given in Lunan's "Hortus Jamaicensis," which states that it was first imported into England in 1724, and relates how a few planks were sent to Dr. Gibbons, of London, by a brother, a West Indian captain. The former was erecting a house in Covent Garden, and gave some mahogany to the workmen, who rejected it as being too hard. Then Wollaston made a candle box of it, which outshone all the doctor's other furniture, and became an object of curiosity and of exhibition. Finally, some was made into a bureau for the Duchess of Buckingham. Certainly Lunan's account is well authenticated.

At this day it would be difficult to decide the rival claims as to the first introduction of mahogany, but it has certainly since then gained a prestige not exceeded by any wood, and its adaptability as an aid to constructive and decorative art is undoubted.

It will be understood that as mahogany grows in the tropical forests, where there are no roads, and, further, there exists an excessive amount of undergrowth of brushwood, which must be cleared, hillocks cut away, hollows filled, and bridges made to get the logs to the nearest waterway, and the transportation of logs weighing from one to ten tons becomes a serious difficulty in the absence of mechanical appliances. In Honduras the season for cutting commences about August. After sufficient trees have been cut, the roads are then formed; cross-cutting is then commenced; by the month of March, which is the dry season, the hauling commences. This can only be done in the month of April, as the ground at other times is too sodden to permit the removal of such heavy weights. Then, if what should be the dry period proves to be wet, the logs may be hung up for a year, and in that time may become unfit for shipment. Assuming that the logs are got to the waterways ready for the rainy season, May-June, then, if all goes well, the rivers rise sufficiently to enable the logs to be floated. But here again disappointments are frequently in store, and the logs become stranded.

In Cuba the logs are cut throughout the year, but more particularly from October to June. When they are prepared they are drawn by oxen to the edges of the forest; they are then loaded on carts to the river. When sent down to the river the logs are tied together, but at the rapids they are separated; after clearing the rapids they are formed into rafts.

Supposing that the logs are successfully negotiated through all the difficulties, from the point of growth to and through the rivers, to the lagoons. Here another danger awaits them—rivers are fresh water and sea-water, salt—but the lagoons are brackish waters, and in these are to be found the "teredo," which cannot exist either in fresh or salt water. Should the logs arrive in the lagoons, and there is no vessel at hand to receive them, then in a few days it is possible that the logs will become thoroughly honeycombed by the "teredo." A few years ago thousands of logs were landed in Liverpool which were not worth freight and charges. So it will be seen how extremely speculative it is to undertake the exportation of mahogany.

The African mahogany trade is quite a new development since 1890, and it has attained gigantic proportions; for all practical purposes its difficulties are identical with those set forth in relation to Honduras and Cuba. In Africa they have their labor troubles, and it is now difficult to get the blacks to engage in the mahogany trade, as mining, etc., offers better pay, and the work is more permanent.

It is generally admitted that the value of all timbers is appreciating, and in the near future it will be found that the value of mahogany will be seriously enhanced.

CROSSWISE DOOR FRONTS.

There is considerable interest in the question of veneering drawer fronts with mahogany, Circassian walnut, oak, etc., having the veneer run crosswise instead of lengthwise of the front. Some think this is a mistake, others think it all right, both sides of the question being argued apparently from the standpoint of appearance only. At first it does look a little odd to see veneered wood running in an unnatural direction on a drawer front, but in the course of time you get used to it, and if it is matched up in crotch or other attractive figure, of course, it makes it somewhat different than when the figure runs plain, without any special matching. The matter of appearance is probably one of getting accustomed to it more than anything else. Naturally, people accustomed to seeing wood run the natural way regard this new idea in drawer fronts as being rather freakish, while those who are familiar with them forget this freakish business and only see the beauty they display. They accept it as being veneered face anyway, and that this fact is well known and that the main object of doing the veneering, is to place the veneer in the position which will display it to the best advantage, and not necessarily in a position that will suggest the natural run of the wood and in a measure imitate solid work. Probably it is a good idea to get away from the notion of making veneered work so as to in some measure imitate solid work, because veneered work shouldn't be an imitation of anything; it should be what it is, veneering, well done and nicely finished.

There is one point, according to "Veneers," that seems to have been overlooked, and that is that veneering crosswise offers mechanical advantages where one is veneering directly on a solid core without cross-banding underneath the veneer. Where the veneer is laid with its grain running the same direction as its core, it is more likely to be buckled or split in the swelling and shrinkage of the core than if laid crosswise. So in making these drawers and placing the veneer crosswise of the body, one also crosses the grain at the core and thus gets a more substantial veneered job from a mechanical standpoint. Of course, where the very highest grade of work is being done the core is cross-banded before the face veneer is put on, and then the veneer is just as well off from a mechanical standpoint running lengthwise as crosswise. Anyway, it is well to develop discussions of this kind, because they will in turn probably bring others, and among the others that might come in this connection are some of the French ideas of placing veneer at various angles and forming a wide variety of designs and figures. Probably from straight crosswise and straight lengthwise we may develop the idea of some other positions of placing veneer that will give even a more artistic effect, especially with veneer of certain figure. So let the discussions go on, and let us hear the opinions of others, not only on this, but on other ideas connected with veneering drawer fronts.

GOOD WORK WITH THE SAW.

Smooth work with a band-saw in the cabinet shop is a subject worthy of constant effort to bring to the notice of those who have the directing of this class of work. When a cabinetmaker, whose wages are an important consideration, has to devote part of his time to scrubbing off defects of the band-saw, when those defects are easily prevented, it is simply throwing money away. A superintendent of a large factory said he did not think band-saws could be as carefully fitted on a machine as the hand-filed saws were. He had tried a machine, but the cause that led up to inferior results in his case might be entirely absent elsewhere. When one hears a saw "screeching" (no other word will express the meaning so well) while at work, it is high time the filing needs some attention and improvement. A poorly fitted saw has a sound that is different from that of a dull saw, and needs other treatment. A poorly fitted saw from a machine made to do good work is fairly good evidence that there is something else beside the saw that needs looking after. The machines are made to do good work, and will do it if properly handled by a competent man.

IMPORTATIONS OF CANADIAN TIMBER IN GREAT BRITAIN.

At Liverpool the importation of Canadian pine deals and boards has been on a very limited scale, and consignments shipped direct from Montreal are being awaited with interest at the time of writing. At the beginning of August there were 7,120 standards of Quebec pine deals in stock as compared with 4,530 at the corresponding date in 1907 and 7,460 in 1906; and 2,150 standards of Quebec spruce deals as compared with 2,050 in 1907 and 2,310 in 1906. Third and fourth quality deals are in short supply. Prices of these woods continue high, values at date being: Quebec yellow deals per standard; 1st quality, £25 to £37 10s.; 2nd quality, £18 to £24; 3rd quality, £14 to £16 10s.

New Brunswick and Nova Scotia spruce and pine deals have reached the Mersey ports in smaller quantities than at the corresponding time last year. The stock in hand at the end of August was 6,000 standards, as compared with 7,650 in 1907 and 6,830 in 1906. The consumption of spruce is now very fair and there are inquiries for forward delivery. Prices stand at £7 10s. to £7 17s. 6d. per standard for St. John and Miramichi wood, and £7 7s. 6d. to £7 15s. for Nova Scotia. Boards and spruce are selling at £6 10s. to £7 10s. per standard. The stocks of these last named woods are much reduced, but are ample for present demands.

Canadian square pine has not been imported of late at Liverpool. Business in this wood has been small, and stocks, though light, are sufficient. At the beginning of the month 23,000 cubic feet of square pine was held at Liverpool, compared with 22,000 in 1907 and 22,000 in 1906. Quebec waney pine has not been imported of late. The stocks on May 1st, amounted to 67,000 cubic feet, as compared with 98,000 at the corresponding date in 1907, and 114,000 in 1906. Values are: Square wood, 1s. 8d. to 3s. 3d. per cubic foot; waney, 2s. 9d. to 4s. 3d.; St. John, averaging 18 inches, 2s. 6d. to 3s. 3d.; Dalhousie, 1s. 3d. to 1s. 8d.

Business in red pine has been very slow. There have been no recent arrivals, and stocks, though light, are fully ample for requirements. The month opened with 9,000 cubic feet in hand at Liverpool as compared with 2,000 and 3,000 in 1907 and 1906 respectively.

Birch has had a slow sale at Liverpool, and prices are easier. Stocks are much reduced in comparison with those held a year ago. The stock of logs at Liverpool at the beginning of May represented 50,000 cubic feet, as compared with 106,000 in 1907 and 81,000 in 1906. Planks have arrived in larger quantities but the stock is still light. On May 1, the stock at Liverpool represented 75,000 cubic feet as compared with 82,000 in 1907 and 151,000 in 1906. Values are still low, being: St. John, 1s. 6d. to 2s. per cubic foot; Quebec, 1s. 8d. to 2s. 2d.; Nova Scotia, 1s. 2d. to 1s. 6d.; and planks 10½d. to 1s.

Elm has also been in less request and stocks have increased. At Liverpool the stock on May 1st equalled 25,000 cubic feet, as compared with 16,000 cubic feet at that time last year and 5,000 in 1906. The price ranges from 3s. 3d. to 4s. 6d. per cubic foot.

Canadian oak has not been imported at Liverpool for some weeks. The stocks of Canadian and United States oak have increased, as compared with a year ago, representing, on May 1st, 100,000 cubic feet, compared with 33,000 on May 1st, 1907, and 44,000 in 1906. The stocks of planks has greatly increased. On May 1st it equalled 348,000 cubic feet, as compared with 39,000 in 1907, and 51,000 in 1906. The deliveries of oak from stock continue light. Values are: first quality, 3s. 3d. to 3s. 8d. per cubic foot; second quality, 2s. to 2s. 11d.

At Manchester on May 1st, Canadian timber held the following position. The consumption of spruce deals had improved slightly and stocks were, 7,670 standards as compared with 14,590 in 1907 and 5,180 in 1906.

Pine deals had only sold to a small extent. Stocks were: 640 standards, compared with 290 in 1907 and 1,460 in 1906. Quebec board pine had come to hand in fair quantity. Sales have been fairly active, but stocks are large. At the beginning of the month they totalled 215,000 cubic feet, as against 192,000 and 111,000 in 1907 and 1906. Canadian and United States oak has not been imported lately at Manchester. The consumption has been moderate, and stocks on May 1st were 20,000 cubic feet, as compared with 5,000 in 1907. Birch, in logs, had been received in fair quantities. A moderate business has been done in this wood, which left stocks on May 1st, 12,000 cubic feet, as compared with 14,000 in 1907 and 6,000 in 1906. Birch planks have been received much more freely and good business has been done at Manchester in this wood. The stocks at the beginning of the month equalled 85,000 cubic feet, as compared with 102,000 in 1907 and 56,000 in 1906.

At London business continues quiet and holders have shown a willingness to meet customers, as regards prices, in order to effect sales. Recent deliveries of deals and boards show a shrinkage, as compared with corresponding periods a year ago. In some weeks the shortage has been very noticeable. The deliveries at the Surrey Commercial Docks from January 1st to May 9th, 1908, of deals and prepared boards totalled 50,996 standards, as compared with 62,842 in the same period of 1907. At Milwall Docks the deliveries were 16,699 in 1908, and 15,768 in 1907. At the London and India Docks, they were 2,806 in 1908 and 2,702 in 1907.

As regards price, flooring boards have maintained their position fairly well. The stock of these boards, however, has been much reduced.

At other ports than London or Liverpool the recent arrivals have been of a miscellaneous kind. Purely local requirements have influenced the importation in most cases. This has been conspicuously so at Cardiff, where poles, pitwood and pit props figure largely among the stocks lately received, wood of the sorts named being used very largely in the coal-mining industry of South Wales.

At Bristol, the arrivals have been of a very mixed character, spars, poles, rickers and miscellaneous "wood goods," forming the consignments. At Avonmouth, hardwood and fancy woods; lignumvitae, lancewood and mahogany chiefly, have formed some of the later importations. On the east coast, the receipts at Hull have been comprised of whitewood, poplar, pitprops and small goods in the softer woods; fair quantities of oak logs, and a very fair quantity of pitch-pine from Mobile. Pitwood and small wood of various kinds have figured largely among the importations at Hull, there being a steady consumption of wood of this class among the collieries and iron stone mines of Durham and Cleveland. At Grimsby, hewn and sawn fir, pitprops, railway sleepers, crossing blocks, square ends, small wood and ceiling laths, have formed recent consignments. Much of this stock would pass into the midland and southeastern counties of England for comparatively small "consumptive" uses, there being no extensive timber using industries in the immediate vicinity of Grimsby. On the Tyne, recent arrivals have consisted mainly of pitwood flooring boards and small goods, including staves and hoops. The heavier woods have been in less demand and stocks are accumulating, owing to the very light deliveries for consumption which have been made of late, through an absence of good work in the Tyne ship-building yards, and a general quietness of industry in the district. The quietness in the main industries has affected the building trade, and little new work is in progress so that the local conditions have not been such as to make large demands on stocks of timber held at Tyne ports. At West Hartlepool, the local coal mining and allied industries have made the most demands upon timber importers. Labor troubles have disturbed the shipbuilding industry of the district, so that less wood has been used in this industry than otherwise would have been. Importations of Dantzig oak of fine quality, and of oak butts, and of pitprops and square timber have been made of recent date. Stocks of such woods are quite adequate for the local demand at the present time. At Sunderland the timber trade has been very quiet owing to a lock-out in a local ship-yard which has disorganized the ship-building industry of the port. Very little timber is accordingly being purchased for shipyard purposes. Fair stocks are held by local timber merchants, though the imports have been very light for some time.

NEWLY INCORPORATED COMPANIES.

Skeena Lumber Co., Limited, Vancouver, B.C. To purchase and operate sawmills. Capital, $75,000.

Ellis Thompson Lumber Co., Limited, Vancouver, capital $15,000. To operate sawmills and deal in lumber, shingles, etc.

Canadian Barrel, Handle and Veneer Co., Limited, Toronto. Capital, $50,000. To manufacture lumber, veneer, handles and a patented collapsible barrel package and cheese-box. Mark and H. J. Armstrong, of Markdale, Ont., and W. E. Lount, 106 Shuter Street, Toronto.

Boxes and Cooperage

WASTE AND ITS DISPOSITION.*

By F. J. Kress.

In thinking hard upon the second part of this subject, there loomed up before my mental vision something that I had often seen in box factories—a huge pile of more or less long and short, narrow and wide, thick and thin, lumber which had been cut off and ripped off and disposed of, neatly piled up at first, torn down over and over again each day, looking for that carload or two order which would use it all up and turn it into good dollars. Such a disposition of waste is an expensive disposition; better far haul it out and burn it up. If there is no such waste pile, and there should not be, lumber will be cut up more economically.

There is in my mind no better encourager for making any old waste than such a waste pile. Like the mustard seed in the Scriptural parable, it grows and waxes strong until it branches out in every direction; but, unlike the trees grown from mustard seed, song birds do not rest in its branches and men do no delight themselves in its grandeur, only mice, rats, and perhaps bats have any use for it, and its a snare and a delusion to its owner.

Now, I'm a firm believer in waste, that is, I know it is impossible to cut boxes without a certain percentage of waste, depending somewhat on the quality and kind of lumber used. If it were in my power to hand you out a formula which, if followed, should enable you to manufacture boxes without waste of lumber, then I should at once become the greatest benefactor of the trade, but there is not the slightest danger, even in these days of more or less successful aerial navigation. All, no doubt, will have to continue to pay this tribute as long as boxes are made.

If a firm cuts up 10,000,000 feet of lumber a year and buys No. 5 boards, paying $16 per 1,000 or $160,000, and adds to it a work bill of $5.50 per M, or $55,000, making an expenditure of $215,000, and the waste is 20 per cent., $43,000 is the tribute.

If No. 4 boards, at $19 per 1,000, making $190,000, and a $5.25 work bill, or $52,500 is added, totaling $242,500, and the waste is 15 per cent., $33,000 is the tribute.

If No. 3 boards, at $22 per 1,000, or $220,000, and a $5 work bill is added, making $270,000, and the waste is 10 per cent., $27,000 is the tribute.

Even the smallest of these sums would be a handsome profit for a business of this output, but it is no more possible to make boxes without this waste than that shoes can be cut out of leather or a pair of trousers out of cloth without waste, so this condition should not make our business less remunerative, if the customer is made to pay for it, but that is where the shoe often pinches. Some box manufacturers are still so confident that they can turn out boxes with little or no waste, that it costs nothing whatever for work bill to make that waste, that they do not take this item into consideration when figuring a contract; and no wonder that the fondly-hoped-for profit after a years business, when the books are closed, has been entirely wiped out.

The waste of which we speak is by all, I assume, regarded as a recognized necessity, although we may forget it or be deceived by it, when figuring, and we will, therefore, call it unavoidable waste, and if unavoidable, it is part of the cost of the product, and as such we are honestly entitled to full pay for it, and none but ourselves are to blame if we are foolish enough to stand the loss.

There is another waste, however, which should receive our earnest attention and constant study to overcome it, and this is the avoidable and extravagant waste. As eternal vigilance is the price of liberty, so everlasting watchfulness is the price we must pay to keep down this avoidable or extravagant waste. Train our eye to see it. Do not leave it to the superintendent and manager altogether. It pays well enough to give it some personal attention and to prevent it, for it can be done.

The box sawyers should, if possible, be impressed with the waste cost. Few of them realize what a large sum of money it involves—how can they, if not told and often reminded? Give them object lessons by placing, side by side until you build a wide board, the unnecessarily wide strips from the rip saw, and end to end the blocks until they represent a board of several feet in length, and if done in the proper spirit, it will surely cause them to think and to be more careful.

If cutters are allowed to form the pernicious habit of ripping part of the waste off either edge of the board, or cut in two the block from the last cut at the cut-off saw, so as to make the waste appear less noticeable, you are encouraging both waste of lumber and of time. Whatever waste cannot be avoided let no man be ashamed of, let it be thrown away in the whole chunk.

I find that to keep off the floor and from around the saws all pieces of lumber, by having for that purpose an extra set of saws to which suitable orders are given for working up such lumber each day, has a good effect, and going from saw to saw at least once a day, viewing the waste made in a manner that the men cannot help but know why you are there, although you do not say a word, and the going over the kindling pile outside the furnace, bringing back occasionally such pieces as should not be wasted, all tend to reduce the percentage of waste-making and to impress the men with the importance of the matter when such attention is given it by the man who pays the bills.

Where odd widths and fractional parts of an inch widths can be obtained, it will reduce waste of both lumber and time if sorted to the half or even quarter of an inch in the yard and so put in piles.

Some firms find relief in using narrow lumber fastened together with corrugated fasteners or by lateral dovetail and glue.

"Waste and Its Disposition." Let there be a disposition to make no more waste to dispose of than absolutely necessary by ever giving the question the best thought and attention.

WASTE IN STAVE JOINTING.

Shrinkage of staves in drying may amount to $1.25 to $2 per 1,000, which, in the course of time, is quite an item in

* From a paper read before the National Association of Box Manufacturers at Detroit.

the account of the stave factory. There is another item of loss, too, that gets a little discussion now and then, but probably doesn't get as much persistent attention as it should have, and that is the loss incident to jointing.

While talking with the proprietor of a slack stave factory one day, the subject of jointing came up and incidentally, too, that of the waste due to carelessness on the part of the jointer. The proprietor said that whenever he caught a man jointing that was careless and took off an unnecessarily heavy listing he first cautioned him about it and then, if he persisted in it, he always felt that the sooner he got rid of that jointer the better, because any careless jointer can easily waste more timber in a day than it would take to pay his wages. Take a slack stave jointer with a capacity of 10,000 a day, and let the jointer cut off just 1-16 more than he should on each joint, there being two edges to each stave, this would make ⅛ in waste on each stave, or about 1,250 inches in a day. This is a little over 300 staves, and on the basis of what might be termed an average price f.o.b. mills, would amount to something like $2. With four slack stave jointers, which is about the usual crew, the loss would amount to $7 or $8 a day.

In tight stave jointing there is exactly the same chance for loss in waste that there is in slack stave jointing, about the only difference being that high grade tight barrel staves are of more value and every inch of wood wasted amounts to more than in slack staves. Of course, it takes something to make a joint on and there is such a thing as carrying it to an extreme in the way of economy, so that there will be time wasted and probably poor joints made but between the two extremes of wasting time and wasting timber there is a happy medium. Probably the main source of wasting time and timber in tight barrel stave jointing comes from having having the jointer knives set a little rank. This is a point that careful cooperage people watch very closely and as a rule they would prefer to have the jointer knives set a little close and have to take a little more time with the jointing than for the jointer knives to be set so rank that there is danger of wasting from 1-6-inch to ⅛-inch on a joint. There are about sixteen joints to a barrel and two faces on each joint, so that it doesn't take much waste to each face to make the staves come up to average width. It is easier to joint tight barrel staves, that is, easier on the man operating the jointer to have the knives set out far enough to cut freely, but it is always a temptation to cut away a little too much wood. It takes vigilance to economize in these things, but it is worth the price because good staves, after they are dried are worth too much to be carelessly wasted by the indifferent setting of the machines or careless handling of the stock. It is not always wise to depend on the operator to watch out for these things, either, but the foreman or superintendent should see to them and keep the man keyed up and doing the work just as it should be done, and then it doesn't hurt the proprietor to take a look into things himself occasionally and impress on everybody the importance of economy in timber as well as in time.

MORE ATTENTION TO DETAILS OF OPERATION.

By George R. Ford.

The eyes of the employer are a great check on wastefulness in a box factory. I have visited many factories and have invariably found that those factories where the employer kept a close watch on the details of the plant, seemed to be more prosperous and showed more activity than those where there was a highly developed system of red tape, with all tapes leading circuitous routes through various foremen and heads of departments to the employer's desk. Of course, system is necessary in any well regulated box factory, but there is no system yet invented that will anything like take the place of direct contact with the factory details on the part of the boss.

This point is of special interest to the box manufacturer, because the question of waste is the one big monster that is continually staring him in the face. He may land a particularly good contract, but by the time the work is turned out by the factory, there has been so much waste in cutting or handling the lumber before it reaches the sawyer, that the profit has been turned into an actual loss.

Take the matter of waste at the saw. The sawyer looks over his lumber and begins to cut the sizes called for in that particular order. The sawyer must decide and decide quickly how his cutting sizes can be gotten out of the lumber with the least possible loss. If he knows that sometime during the day his employer will be around to look over his work, he will be constantly on his guard, so that he will be sure the waste pile near his saw will not show to the practical eye of his boss that he has been careless in his day's work.

Some sawyers have been known to cut up into small strips or blocks particularly large pieces of waste lumber, by passing them through the saw several times before consigning them to the scrap heap. This is a particularly bad practice, since it is a great waste of the sawyer's time, as well as a waste of material. If the employer is constantly on the warpath through the factory, he will soon discover this practice and be able then to stop the leak—a thing that he could scarcely hope to accomplish from his office.

It will often happen that pressing duties from the outside in managing the affairs of the business will prevent the employer from making daily trips through the plant. But during such times he can go to the scrap pile in the yard and pick out a piece or two that he knows should not be there and carry it back to the sawyer for his inspection; and this can be done in such a way that it will not put the sawyer in a bad humour, and its effect will eventually work a revolution in the sawyer's methods. In this way the employer can effectually impress on the mind of the sawyer the great importance of the scrap pile, a thing he is too often forgetful of in the rush of his daily work.

The labor cost is an important item in the box factory, and here also the presence of the employer can do much in preventing a waste. One box manufacturer said: "The heavy foot of the 'boss' is absolutely necessary in a successful box plant." And the "heavy foot of the boss" has a very effective influence on his employees. They are always anxious to appear at their best when he is around, and they will be more apt to work with more activity and alertness when they know that he is taking a personal interest in what they are doing.

Not only does this personal interest in the details of the factory prevent a certain amount of loafing on the part of some employees, but the whole force will work with a greater enthusiasm, which is conducive to better work and in the end better boxes will be turned out, with the same expense that other factories are turning out poorer ones.

There are other large advantages to be gained in a box factory by the personal attention to the details by the employe revery day, two or three times a week, or even once a week. Of course the superintendent is supposed to look after these things, but he cannot have quite the same interest that the owner has in seeing to it that things are run as economically as possible.

On the other hand, the employer is sometimes obstinate about allowing the superintendent to make certain changes in the plant that are necessary, for the reason that it involves some little expense. If the employer is personally acquainted with the details he will see at once the handicap the men are working under.

The arrangement of the saws, planer or nailing machines may be such that much loss is made in handling the material from one operation to another. A box factory must be so arranged that the material will be handled as little as possible from the yards to nailing-up machines. Often, when a factory is built, it is thought that the best arrangement has been devised in placing the machines, yet when the plant is set to running and the rush of business is on it is found that little changes here and there will save much in time, and thus reduce the cost of operation.

I once knew of a box factory that was built two storeys high on account of lack of ground space. The company also planned to do a large business in hardwood flooring. It was found to be the best arrangement to have the cutting done on the first floor, and by means of an elevator take the lumber to the second floor for printing and nailing. The operations on the second floor were so arranged that the finished boxes would land near the elevator where they could be loaded on a truck and run on to the elevator, lowered to the ground floor and run to the loading door to be stacked on the wagons for delivery.

After the plant had been running about a month and the box department was loaded with work, the owner was looking over things about the factory in a personal way and decided he could make an improvement on the arrangement. He rearranged the operations on the second floor so that the finished boxes landed near a window, where by a little rearrangement of the yards the wagons could be run in. He then made a door out of this window and built a fairly good sized platform just outside with a shute running down to within a few feet above where the wagons would stand to be loaded.

This little arrangement saved quite a little time in handling the boxes both in the factory and on the wagons, and is only one instance of what an employer can do with a little attention to the details of the work in the factory, although he may not have as much practical experience in the mechanical end of the business as his superintendent.

It has sometimes been said that the small box factory usually makes a larger profit in proportion to the investment than the large plant. If this can be attributed to any one thing it is probably because the owner of the small factory is often his own superintendent, and in this way is in constant touch with every phase of the operation of his establishment. To stop the leaks in any box plant is an important feature of the operation of the plant and the box man cannot attach too much importnace to this phase of his business, nor feel that time spent in these seemingly small matters is wasted.

PRODUCTION OF TIGHT COOPERAGE STOCK.

The Bureau of the Census and the Forest Service of the Department of Agriculture have collected statistics concerning the annual production of various forest products, and the preliminary figures on tight cooperage stock for the year ending December 31, 1907, have just been issued.

In response to the heavy demand for forest products which extended through the major part of 1907, all industries using standing timber for their raw material showed marked activity. Both in the aggregate quantity of output and in average value per unit the reported production of tight cooperage stock exceeded that of 1906 by substantial margins. The combined production of sawed, bucked and split, hewed and beer and ale staves reported was 385,232 thousand pieces, against 267,827 thousand pieces in 1906, an increase in quantity of 117,405 thousand pieces, or 43.8 per cent., while the average value per thousand advanced from $31.32 to $33.60. The greater thoroughness which characterized the 1907 canvass of establishments engaged in the manufacture of this stock possibly accounts in some degree for the material increase indicated in the annual output.

Sawed staves, which constituted by far the greater part of the total production in both years, and which are utilized chiefly in the manufacture of barrels for oil, whiskey and wine, increased in quantity from 219,524 thousand pieces to 325,653 thousand pieces, a gain of 106,129 thousand pieces, or 48.3 per cent. This increase was accompanied by an advance in value from an average per thousand of $26.18 to an average of $27.83. The production of bucked and split staves increased from 18,352 thousand pieces to 25,082 thousand pieces, a gain of 6,730 thousand pieces, or 36.7 per cent., accompanied by an advance in average value per thousand from $47.23 to $50.92. The production of beer and ale stock increased from 20,170 thousand pieces to 21,760 thousand pieces, a slight gain of 1,590 thousand pieces, or 7.9 per cent., but the average value advanced from $42.65 to $50.09 per thousand. Hewed stock, including French claret, pipe and similar grades, which requires a high quality of white oak timber as material, and which is manufactured largely for export, showed an increase in the quantity produced from 9,781 thousand pieces to 12,737 thousand pieces, a gain of 2,956 thousand pieces, or 30.2 per cent., which was accompanied by an advance in average value from $93.62 to $118.80 per thousand.

In heading the total production reported was 27,692,994 sets, with a value at the mill of $6,864,485, as against 17,774,375 sets in 1906, with a mill value of $3,999,630, an increase of 9,918,619 sets, or 55.8 per cent. in quantity, and $2,864,855, or 71.6 per cent. in value, the advance in average value per set being from $0.225 to $0.248. The fact that the average value of heading has not materially changed, while that of all classes of staves has advanced, in some cases sharply, is worthy of note. Owing to the rapidly growing scarcity of oak, from which originally both tight staves and heading were made exclusively, other and cheaper woods are, where possible, being introduced as substitutes. Cypress, red gum, and basswood are thus in a measure supplanting oak heading, and the fact that the production of 1907 included a much larger percentage of these woods than that of 1906 accounts for the relatively low average value per set in the latter year. Beer and ale heading, which formed only 6.7 per cent. of the total production in 1907, and which was made exclusively from selected oak, advanced in average value from $0.233 to $0.267 per set, an increase of 14.6 per cent.

According to a report to the Ottawa Government made by P. B. MacNamara, Canadian Trade Commissioner, Manchester, box shooks made in Canada are preferred by British manufacturers and importers. He called recently on one of the largest shoe manufacturers in Great Britain in relation to the purchase of Canadian box shooks by his firm. They expressed an inclination to favor Canadian shipments, everything being equal, and stated that a few shipments had been received, but were not continued. He contended that the retail grocer in England demanded a well-finished box, and obtained it; so that if one manufacturing firm furnished a first-class box the others must do likewise. From a recent visit to the United States and Canada he formed the idea that the retail grocers in these countries were not so particular regarding the box as they were in England, and that, therefore, the box shooks heretofore received by them were not of sufficiently high standard to satisfy the retail trade there, and that purchases were not continued. This firm is prepared to take up the matter with the Canadian sawmill owners, and furnishes the following specifications for a perfection box: Sides, 18⅛ inches x 11⅝ inches x 5-16-inch, in two pieces; tops and bottoms, 16⅞ inches x 13⅛ inches x 5-16-inch, in three pieces; ends, 12⅝ inches x 11⅝ inches x ⅝-inch, in two pieces; bars, 11⅝ inches x 2 inches x ⅝-inch. It is necessary that a sample shipment of 1,000 feet be made, and this sample shall represent the average quality of all future shipments, and on this alone will business connection depend. In order to obtain and secure a market in England for box boards the Canadian sawmill owners must avoid want of uniformity in the cutting and variation in the thickness, and the deliverance must be regular. The c.i.f. quotation must include cost of putting them free over the side of the ship into the companies' steamers at Liverpool.

A very great demand exists in the Manchester district for them, the chief source of supply being at present Norway and Sweden, but these sources are being gradually depleted and prices have materially advanced.

COOPERAGE STOCK REPORT.

Sept. 26, 1908.

During the month of September trade has not shown the full recovery expected, principally owing to the fact that the export apple buyers are holding off the market to a great extent, but business picked up considerably towards the end of the month, not only in the fruit barrel stock, but in all lines of stock.

There is going to be more apple barrel stock used than the August reports of the crop would show. Owing to the percentage of fruit suitable for export being very large, a less number of apples will go in the barrels than when the crop is larger and the apples smaller.

Now that the new wheat has started to come in, most of the mills are running day and night, using large quantities of flour barrel stock, which makes the flour milling industry lively. From present indications all of the flour barrel stock in the country will be required to take care of the home trade without shipping any for export.

The fruit preserving season now being in full force, means that more sugar barrel stock was used during September than any previous month this year, and, as the beet sugar campaign will soon be on, a boom in prices of sugar barrel stock is looked for, with a clean-up for the year of the mills on this grade.

The general trade of the country continues to improve, no doubt helped by the bountiful harvest, so that the manufacturers of cooperage stock are taking a more optimistic view than at the close of last month.

INTERMITTENT ADVERTISING.

If a man is ill, and the physician prescribes a certain medicine for him, to be taken at regular intervals, what would you think of a nurse who disregarded the instructions and administered the medicine intermittently?

You would think it inexcusable, if not criminal carelessness, would you not?

And that is just what it would be.

Now, when a business is being advertised, it is for the purpose of making that business more vigorous, or to prevent competitors from making it less vigorous than it is.

Isn't that right?

Then, would it be good policy to advertise intermittently?

Wouldn't that be right in line with the policy of the nurse who neglected to give her patient his medicine regularly?

Certainly it would.

I have known business men to start advertising their merchandise in daily papers and keep it up constantly every day for months at an expenditure of thousands of dollars before they ever derived any benefit that they could trace even remotely to that advertising. But finally the change came, and new faces crowded the store, drawn there by the persistent, intelligent advertising. These advertisements were written so as to attract attention and carry conviction. They were among the best worded and most attractively designed advertisements that appeared in those particular papers, and it required months of constant hammering away to get the trade started; it continued to come. And their advertisements were eagerly watched for every day.

And they continued to advertise.

—The system by which planing cylinders may be adjusted up or down by means of screws in the frames is one of the best things about the modern machine, and the solid sash makes it the more so, because it keeps the boxes in perfect line, and raising one end of the cylinder does not make the boxes bind in the least. In planing fine work, where perfect thickness is required, what could be better than the adjusting lifting screw? If a man tries to alter the thickness of either edge of his stock by setting out the knives, he has a long job on hands, while altering the cylinder by means of the lifting screw is only the work of a very few minutes.

—The Canadian Trade Agent in Japan sends a report, in which he speaks of the great possibilities for Canada in the lumber and timber trade, especially for pine and the British Columbia heavy timbers. He shows the growing need for these for railways and national works going on in Japan, especially in the Imperial yards, where millions of feet of lumber and timber will be needed during the next two or three years for building wharves, ships, and so on. He is of opinion that $1,000,000 worth of lumber and timber will be needed in the shipyards alone during the next year. He shows how 280,000,000 feet of lumber can easily be used in Japan, a large part of which must be imported. The United States now gets the bulk of the import lumber trade, and is hot after it. The coming great Japanese Exposition, to be held in 1912, is also pointed to, as it is claimed 72,000,000 feet of lumber for buildings to be put up will be needed for it. Then the city of Tokio is practically being rebuilt, and there are vast possibilities there.

Machinery and Mill Equipment

BELTS AND BELT LACINGS.

One machinist tells us, emphatically, that a "hinge" lacing is the only one any sane man will use; another insists that his peculiar method of fastening is the only right one; yet another consigns to perdition all who use anything but hooks. It is for us to give ear—within reason—to the claims of each, and to use that method which seems best adapted to the case in hand. So varied are the conditions under which belting and belt fastenings are used that one cannot, without undue arrogance, do more than to generalize as to what is best in them, and expert choice is a matter of selection, governed by the immediate conditions.

It is probably conceded by all that, under average conditions and for continued use, the best grade of leather belting is the most economical and effective. There are other reasons than parsimony, however, for the use of the various low-priced belts. Much dampness makes rubber preferable, and extreme length often makes the lighter weight of cotton a valuable feature; while many other variations of conditions and preference tend to prevent the exclusive use of leather.

For woodworkers, the width of the belt is usually decided by the pulleys on the machine, which, most regrettably, are usually too narrow. Whether this is because manufacturers desire it to appear that their machines require a minimum of power or because machinists fail to appreciate the difference between the conditions in a woodworking shop and in their own, is immaterial. The fact remains that the dry and dusty atmosphere in which woodworking machines are usually operated is far from being conducive to the best results from belting; and one should not fail to use a belt as wide as his machine will take.

Beware, too, of economy in length. As a general rule it is advisable to have a belt as long as circumstances will permit, and there is little danger of error in the way of getting one too long, unless it is vertical or nearly so. The best service is given by a belt sufficiently long so that it will do its work and yet sag a trifle between the pulleys, as the elasticity thus attained mitigates the irregularities of stress and speed.

The idea that more power may be transmitted by a long belt than by a short one having the same tension, as maintained by some, is hardly more tenable than the notion that a heavy balance wheel creates power, but it is certain that the longer belt requires less apparent tension and that it will wear longer. It is also true that the longer belt causes less strain on the bearings, as its superior elasticity lessens the jerks caused by faulty lacings or other lumps passing over the pulleys. With the most perfect machinery there are always some irregularities and we should aim to cushion these as much as possible.

In this matter, as in all others, conditions make a lot of difference. It is probable that, with water or electric power, with a belt or even thickness running over turned iron pulleys, in a place where sawdust, shavings and the like are not apt to get under it, a short belt will give nearly as good service as a long one. With an internal combustion engine, or even with steam power, under ordinary shop or mill conditions, the case is quite different.

All belts stretch, and, as it is not usually convenient to change the relative positions of the pulleys on which they run, it is expedient to have some simple method by which the ends may be quickly joined. The oldest method of so doing—and probably the most common to-day—is by means of lacing with a leather thong. Consequently all belt fastenings are spoken of, in a general way, as lacings.

It is highly desirable that the joint in a belt be fully as flexible as other parts; while, on the inside at least, there should be no break in the surface texture. A well made lacing of leather gives the desired flexibility and approximately even texture. It is impossible, however, to make a lacing with this material which will not cause a slight (more often it is considerable) break in the continuity of contact between the belt and the pulley.

This is a matter of more moment than at first blush appears, as it is quite possible that this slight break, besides adding much to the strain on the belt and bearings, may be the starting point of a serious slip. If you watch an engine starting a heavy train you will note that when the wheels once begin to slip, practically all tractive force is lost till the steam is shut off sufficiently for the wheels to get a new grip. So, when a belt once starts to slip it will not pull anything like its normal amount till it gets a fresh start. Now it is probable that, if our eyes were quick enough to see it, nearly every slip would be found to originate at the point where the lacing strikes the smaller pulley. On the smaller pulley, because the sharper bend makes the jar greater and breaks the contact to a proportionally greater extent than on the larger one.

The form of fastening which most perfectly preserves the continuity of the inside of the belt is doubtless the "boot leg lacing," made exactly as was the seam in the side of the leg of the "stogies" our fathers used to wear, except that the projecting part of the seam is outside. This projecting seam is an unsightly thing, somewhat dangerous to the unwary, and cannot be used when the outside of the belt runs close to any part of the machine or building. For rubber and cotton belts it is by far the strongest joint known, as well as the cheapest, for the lacing not coming in contact with the pulley, there is no wear on it, and any stout cord answers as well as lace-leather for the purpose. Even as people will buy poisonous food of correct color in preference to healthful food off color, the looks of this joint count very much against it; and this, coupled with the real danger from the ugly proturberance on the outside, effectually bars it from common use.

There are many forms of metallic belt fasteners which, if properly used, give excellent results. The most strenuous objection to them probably arises from the fact that one accustomed to using lace-leather is apt to use a larger size than he should, thus needlessly impairing the flexibility of the belt. With sizes adapted to the work and with holes so punched that the strain thereon will be equal, most of these will be found exceedingly satisfactory and cheap. It is true that a loose end is apt to "raise hob" with wood pulleys; but one should always use care in the matter of loose ends.

The writer has found wire lacings very satisfactory on leather belts, and a form of hook so pointed that it may be driven without the need of punching holes, has been found very expeditious and durable. The superior strength of metal makes it possible to use fasteners of such small size as to make a very flexible and strong joint, but with it, as with any other material, the efficiency depends largely on the skill and judgment of the person doing the job.

Of course an endless belt that would not stretch would be ideal, but while we can make belts practically endless we cannot avoid the stretch. The man who has the time and ability to make cemented splices in his belts, whenever they need taking up, needs no condolence; but most of us feel that we cannot afford the time.

The use of a tightener, though it practically makes two short belts of one, would be permissible, if at all, with a belt so joined. A tightener, however, is at best added mechanism, added friction, and added trouble, while its use is very apt to be abused. Many instances might be cited where machine operators have found it more convenient to put more pressure on the belt-tightener than to find out just why more power was required, thus reducing loss of power and often serious damage. As a general rule tighteners, like sticks nailed up to keep belts in place, indicate something wrong with the machine operator.

Speaking of keeping belts in place, suggests a further word in that regard. If the shafts are parallel, the pulleys in line and slightly crowned, a belt of the same length on both edges will stay on and run true without any guides, provided it is not overworked.

Occasionally we hear some novice gleefully announce his discovery that a belt does not always seek the high point on a pulley, but to these should be suggested the expediency of lining up their shafts. Two pulleys may be so shaped and placed that a belt will run centrally upon them, even though the shafts are not parallel; but it is extremely bad practice, and should never be followed except in cases of the most dire necessity.

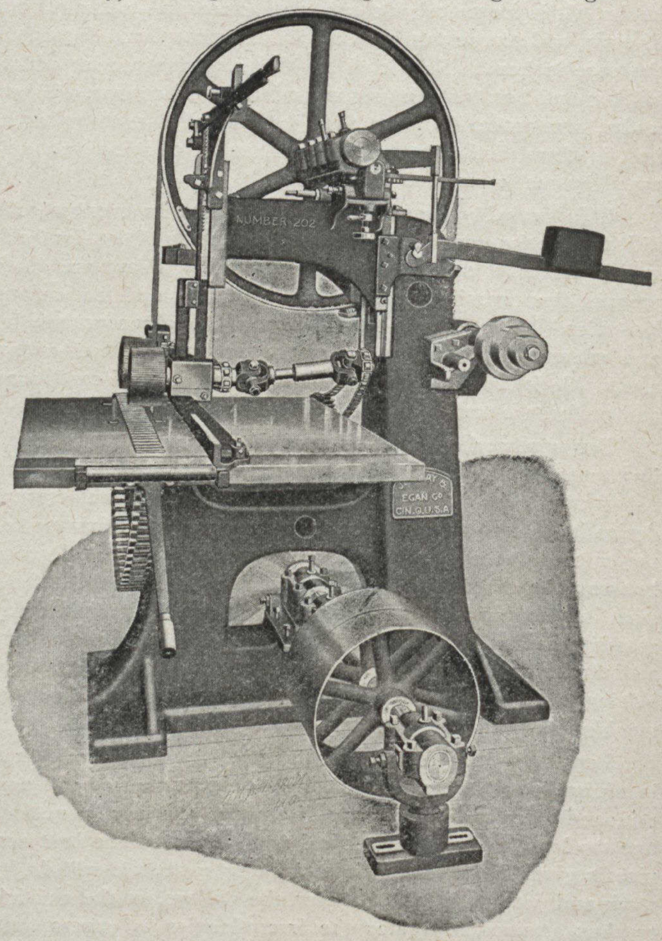
The dry atmosphere of woodworking plants, as before mentioned, makes necessary in order to attain the best results from leather belts, the application of a very limited amount of some dressing of an oily nature in order to keep them soft and pliable. The dust, with which such atmosphere is inevitably laden, makes the application of any great amount—especially if it is at all sticky—very objectionable. Such stick dressing sometimes serves a good purpose in tiding over a time of special stress; but it is likely to do more harm than good. Unless used with the utmost discretion, it soon forms, with the dust it inevitably collects and holds, a coating which seriously impairs, rather than increases, the tractive power of the belt. It is well to bear in mind that belt-dressing has virtue only in so far as it soaks into and softens the belt, and that anything which tends to form a coating, or to harden the surface, is detrimental.

A NEW COMBINATION BAND RIP AND EDGING SAW.

The accompanying illustration shows a new combination band rip and edging saw. For edging, the table is provided with a travelling chain under the out-feeding roll, as shown in illustration, and is operated by a sprocket chain and gearing from the same shaft that runs the upper feed rolls. This travelling chain has a vertical adjustment and can be quickly dropped below the surface of the table to be out of the way for ripping.

The column is very heavy, cored and perfectly free from vibration. The distance between the fence and the saw blade will admit material up to 24 inches wide. The rolls may be raised to receive timber 12 inches thick. The machine will edge material 12 inches wide. The table is of ample size, and has at the front a plainly stamped index. Idler rolls are fitted in the table to remove friction. A cam lever releases, moves and clamps the fence, accomplishing the adjustment of the fence more quickly than by any other means yet devised.

The wheels are 42 inches in diameter, entirely of iron and steel, with spokes. The lower, heavy and with solid web, cirulating less dust and sustaining great momentum, so that its speed governs that of the upper, preventing the latter overrunning the former. The wheel shafts are of steel, extra heavy, running in extra long self-coiling bearings.



No. 202 Band Rip and Edging Saw. Manufactured by J. A. Fay & Egan Co., Cincinnati, Ohio.

The straining device (controlling the upper wheel and the path of the saw blades on the face of the wheel) is new and very sensitive, and has a forward, backward, and also a side adjustment. It is regulated by an adjustable weight and a compound lever so sensitive that no matter what the vibrations are the strain takes up the slack in the blade instantly, adding wonderfully to the perfect working of the machine and the life of the saw blade.

The saw guides are the latest improved pattern with sectional hardwood blocks arranged to permit of taking up the slightest wear and perfectly guiding the blade in the plane of the cut.

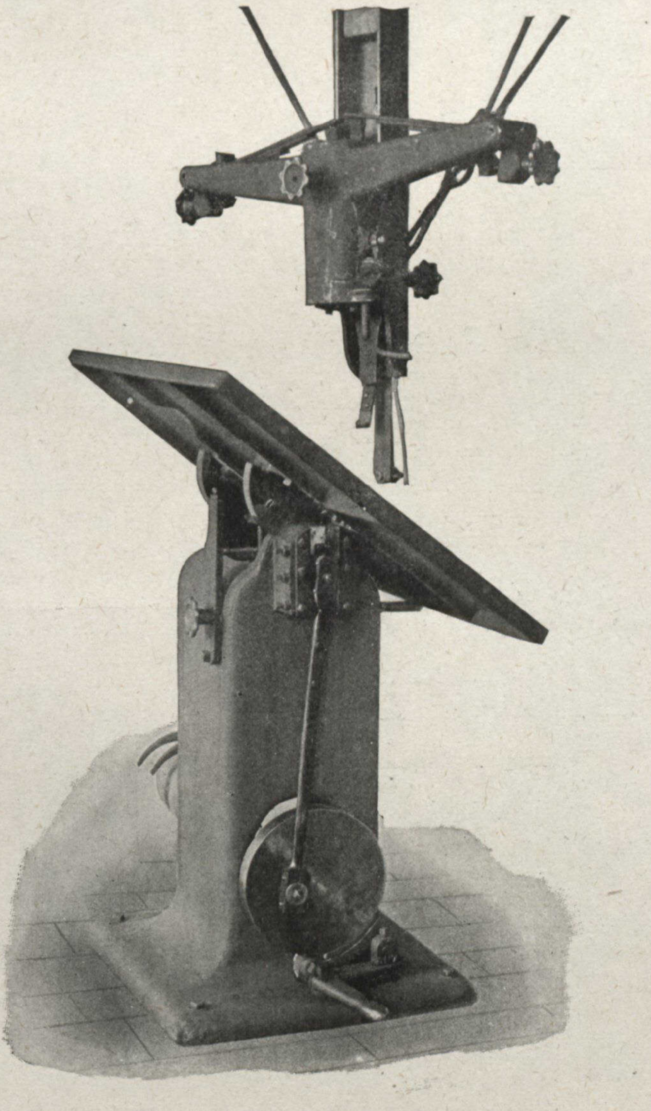
The feed is very powerful, the driven feeding-in and feeding-out rolls placed close together, enabling short stock to be worked to advantage. They are adjustable up and down instantly by means of the long lever above, convenient to the operator, or they may be raised from the board, instantly stopping the feed, or lifted quickly out of the way for use as a hand -feed rip saw, all of which may be accomplished by a single movement of the long lever. The feeding-out roll bearing is adjustable to take up the slack in the driving chain.

For further information regarding this tool, write the manufacturers, J. A. Fay & Egan Co., 153-173 West Front Street, Cincinnati, Ohio, who make a standard line of woodworking machinery.

AN IMPROVED SCROLL SAW.

The accompanying illustration represents a No. 322 Improved Scroll Saw with Tilting Table and Air Pump built by the Clark Demill Company, Limited, Hespeler, Ontario.

Especial care has been given in designing and building so as to furnish a first-class machine at a comparatively low price while the high standard of our workmanship is maintained and in many particulars advanced.



No. 322 Improved Scroll Saw.

Probably more Scroll Saw blades have been broken through poorly constructed straining attachments than from any other cause. We have found from experience of years that the machine illustrated above is one we can recommend as having the provisions in the strains to meet all requirements in a very successful way.

They have a complete system of numbering and lettering applied and available when repairs are necessary.

The frame is a cored column cast in one piece, being very broad at the base to enable the machine being run at a high rate of speed without jarring in the least.

The straining device is a model in construction, consisting of two steel springs constructed of a series of plates of graduated lengths so arranged that a movement of ⅝-inch on the point of springs gives the saw a stroke of 4 inches. The strain can be increased or diminished at the will of operator.

The table 29 x 36 inches can be set in a moment at any desired angle, either to the right or to the left, and is securely held in place by an eccentric lever.

The crank shaft is of special steel 1 7-16-inch diameter, bearings are 4 inches long lined with the best babbitt. Machinery can be belted from any direction.

The crosshead is made of bronze running in V-grooved slides, which are made adjustable for taking up wear should any occur after long usage. Slides are self-oiling.

The machine can be started or stopped by the foot lever at front. The movement of the lever to stop the machine also engages the brake.

Adjustable stay rods are attached to the frame of the straining device to hold it firm and true when put up.

We furnish one of each following sizes of saws, 3-16, ¼, ⅜, 1½. They are quickly adjusted and the machine easy to keep in order.

PULLEY WORKING LOOSE.

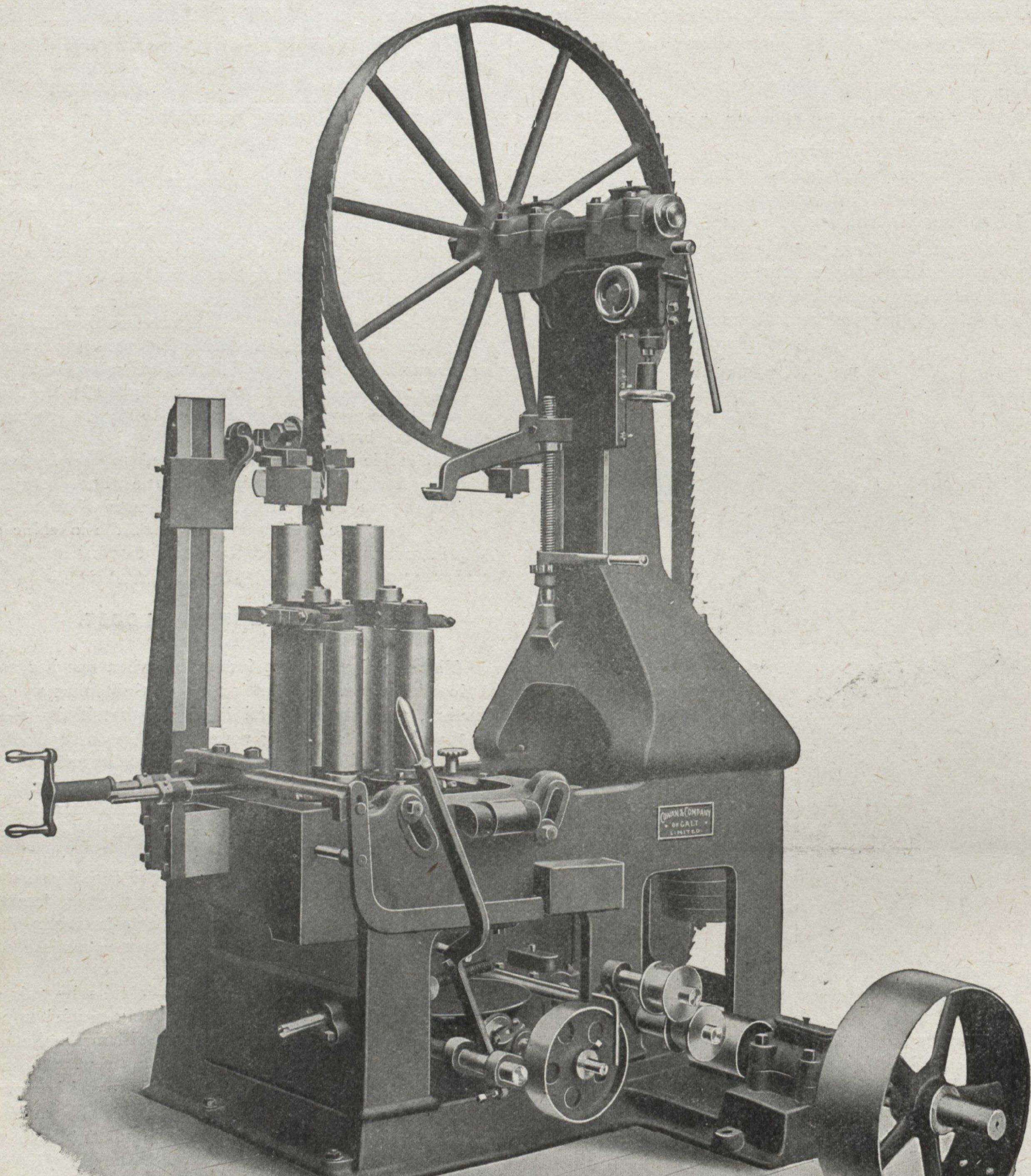
There is always room for trouble when one has anything to do with wood. In putting on or tightening up a wood bushing, the first essential is to see that it fits the shaft, for therein lies its holding power. If it is too small, of course it can be worked out, though the job is well worthy of the best workman on the premises. In new work, however, it generally fits; and, when readjustment is called for, the hole is generally too large. Then appear a multitude of devices and makeshifts, some of which would scare a mud turtle. Some people plane off the edges of the bushing and screw up the bolts some more, sometimes putting something between the bushing and the hub of the pulley, while others wrap the shaft with a piece of leather, and many resort to a piece of sandpaper.

The writer has attained the best results by using plain paper tightly wrapped on the shaft, being careful to use just enough so that, when compressed, it will make the bushing fit snugly all around, just as when it was new. Too much is as bad as too little. Paper, tightly compressed is a very firm substance indeed; and, in this position, holds much better than leather, which is rather slippery and too elastic for the purpose and fully as well as (I think better than) sandpaper. Sandpaper is "good grit," but grit, indiscriminately applied, isn't good for machinery. The glue and sand, on sandpaper, rather tend to prevent that close-fitting contact that is so essential to a good grip; and, admitting that it holds as well as plain paper, when it does slip, there's something doing which were better undone. It would seem that an even firmer grip might be attained by wetting the paper before wrapping it on the shaft; though, as it would be necessary to let it dry thoroughly before the pulley was put on, it would probably be best to use paste instead of water to moisten it with, in order to guard against its unwrapping as it dries.

CANADIAN FAIRBANKS COMPANY.

That the natural resources of this country are appreciated by our leading financiers is evidenced by the growth of the wood-working industry. During the past few years many large corporations have been formed to enter into the manufacture of lumber and this great business is becoming more and more a factor in our country. The Dominion is rich in lumber and our friends across the border are becoming uneasy on account of the advantage we have over them in not having cut the greater part of our timber lands.

To keep pace with the growth of the wood working industry some of our largest and best industrial establishments have built extensive plants for the manufacture of wood-working machinery. Among these concerns Messrs. Cowan & Company, of Galt, Limited, are the largest and most exclusive manufacturers of wood-working machinery in Canada. The identification with the manufacture of wood-working machinery for a long period of years and the leading part they have taken in its development has given extensive and valuable experience which is placed before their customers and users of wood-working machinery in general through ma-



Band Resaw, No. 171.

chinery of the most modern design. It is the purpose of this company to manufacture wood-working machines which are the best in their respective classes and careful attention is constantly given to every detail to insure workmanship of the highest order.

Messrs. Cowan & Company keep in close touch with the needs of the country and are particularly well adapted to meet any special requirements by knowing the existing conditions. Messrs. Cowan & Company are principally a manufacturing organization, however, and as the trade can best be served by dividing the manufacturing and selling organizations they have found it advisable to enter into an arrangement with Canada's largest and best equipped railway, mill and supply house, The Canadian Fairbanks Company, Limited, to act as their selling agents.

The Canadian Fairbanks Company have warehouses in all of our large cities and reach every point in the Dominion through a force of travelling men aggregating nearly one hundred. Many of these men are mill engineers, especially trained in the machinery line and prospective buyers will be able to obtain much information from them. The Canadian Fairbanks Company carry the Cowan machinery in stock at their various warehouses and sawmill and lumber manufacturers will be very glad indeed to know that they can obtain prices and information pertaining to machinery, such as they may require, at any of these houses which are situated at Montreal, St. John, Toronto, Winnipeg, Calgary, and Vancouver, or through the salesmen direct who will call on application.

The Canadian Fairbanks Company also handle mill and factory supplies such as are used in the manufacture of lumber and a purchaser can buy his entire equipment from this concern should he so desire, thus getting the benefit of the lowest prices and at the same time dealing with one party instead of several.

We are illustrating a new band resaw recently brought out by Messrs. Cowan & Company. This machine was produced with the idea of meeting the demand for a high grade resaw which is well suited to general work. It is specially adapted to the requirements of sash and door factories, furniture shops and planing mills, etc., and is provided with every appliance which experience has shown to be needed.

The general construction is massive and the vibration is reduced to minimum. Every working part is so placed as to be within convenient reach of the operator and the entire arrangements indicate superiority in construction, capacity and convenience.

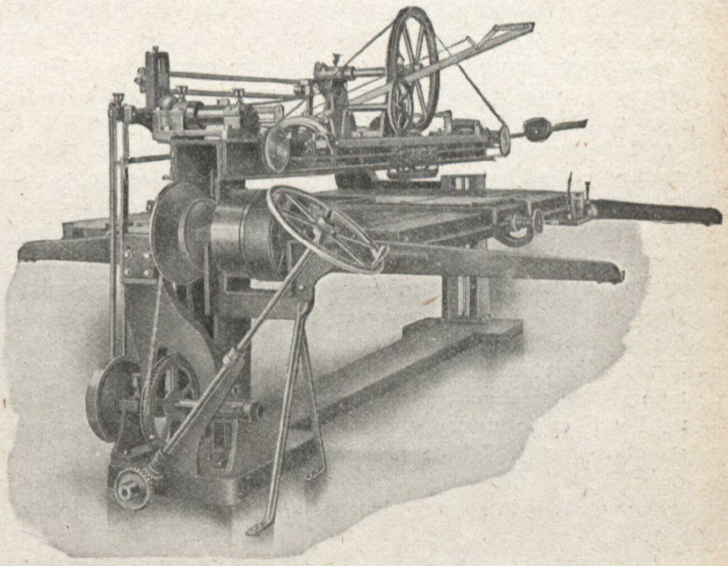
These machines are built in various sizes, and the Canadian Fairbanks Company will be pleased to quote prices and furnish any other information on application. This company solicit inquiries from lumber manufacturers requiring the best machinery which our most modern factories can produce.

HOW TO BRAZE HOLLOW CASTINGS.

Take old wagon or buggy boxing and crack it. Drive a very thin wedge in the crack to keep it from closing tight when hot. Take the softest brass fillings or spelter that can be got. Mix it with about one-eighth of its bulk of boric acid. Put the box in the fire and heat red. Dip a point of a lily in the mixture and spread it along the crack; blow up until the brass is melted. Take out and lay it away to cool. Be careful not to jar while hot. Take a sledge and mash up when cold and you will see that you have brazed the easiest thing possible, and for this reason the brass was clean and the work contracted and did not move while heating and cooling, as separate pieces would, which is the secret of the whole job. If your break is dirty or rusty, file, scrape, saw and brush with muriatic acid. Or if you use common soldering acid in the shop that is best.

FISHER SANDER COMPANY.

The Fisher Sander Company, manufacturers of Sanding and Rubbing Machinery, Berlin, Ont., had an interesting exhibit at the Toronto Exhibition last month of their sanding machine which is becoming increasingly favored in piano, organ and furniture factories, carriage factories, car shops, and all having to do with interior hardwood finish. People were noticeably interested in the exhibit, and several machines were sold. One great reason for this is that it will take work direct from the press and finish it without any handwork ready for the varnish room, thus saving all hand scraping. The sand belt is of ordinary sandpaper, with a working sur-



face of 11 square feet with no waste of paper. The gap end allows the operator to finish material double the length of the table. Among the establishments which are using this machine and who, judging from letters received form them, are more than satisfied, are the Toronto-Waterloo Office Fixture Company, Waterloo, the Kensington Furniture Company, Goderich, Bell Piano and Organ Company, Guelph, etc. etc. This company also make the rubbing machine shown in accompanying illustration. It is said to be the only machine on the market which will rub and polish table or desk tops without removing same, as the rubbing table drops 32 inches, thus allowing work of that thickness to be finely finished. The machine is furnished with gap end allowing operator to finish material of double length. The Canadian Office and School Furniture Company of Preston has one of these machines and it is doing splendid work.

Besides the above machines, the Fisher Sander Company make a graining machine and several other woodworking specialties.

FRICTION DRIVES.

A friction drive for heavy machines or saws in a woodworking shop is objectionable as a rule, and not always a success on such light drives as a feed-belt unless the care of the machine is in competent hands. The exception is found to the rule where the frictions are in the hands of a careful mechanic who will see that the feed disks are in good shape. The tendency to let a friction run as long as it will do the work is general, and they are often run after they have reached a condition that calls for renewal or repairs. This is generally the case where the friction is on a line shaft and is difficult of access to make the needed repairs. A bevel friction drive to a resaw in a planing-mill had worn down until the face of the paper was below the line of the flanges. As always happens when things are neglected, the saw this friction drove stuck in the cut and a hasty effort to throw off the friction broke off the lever just below the catch. Before the engine could be stopped the paper had ignited and started a blaze which took the most active work on the part of the crew to check before it set the mill on fire.

LOOK AFTER THE BELTS.

Many a belt gets the main portion of its care when it is put on the pulleys for the first time. As a rule new belts are carefully put on, and right there the care stops, unless they are main driving belts or something of that kind, coming directly under the supervision of the engineer.

Take small belts in the factory that drive rip saws, cross-cuts, and even many planer belts, and after they are carefully put on they get very little specific attention until they force it on themselves by failing to do their work, by continually slipping on the pulleys, or the lace or fastening coming undone and attracting attention. Then, especially if the belt forces attention by slipping on the pulleys, attention is generally interpreted to mean tightening, and whoever has that belt in charge proceeds to take his belt tools and take a little slack out, after which it is put on to work again until it forces attention once more. Then it gets the same attention again. There are exceptions, of course, but as every man knows who works with or around belts, this is the way it is in so many instances as to make it practically a rule.

Of course, it is easy to understand how we get the idea that causes attention to slipping belts to take the form of tightening, but after working past the "a b c" stages of learning, we should also begin to recognize the fact that tightening is not the only attention a belt should have. Frequently by giving it attention in other ways it not only relieves the apparent necessity for tightening, but lengthens the life of the belt and makes the work much easier on the machinery. Attention to belts should include, among the first things after a man passes the "a b c" stage, proper cleaning and keeping in order—that is, keeping the material of the belt in such condition that it will give the best possible service in transmitting power.

Every once in a while some woodworker tells of extremely bad conditions he has found certain belts in, and of the treatment he has given them to attain better results. Generally, especially if it is a leather belt that is concerned, the belt has become foul either from oil or from the reckless application of some belting compound, either purchased or home-made. Sometimes to all this is added accumulations of dust and other foreign matter from its surroundings. Naturally the first thing to do under such conditions is to clean the belt either by washing or scraping, or both. In performing this task ideas and practice vary somewhat, and probably always will, but all agree that it is necessary occasionally to clean a belt to put it in fit working condition.

In cleaning leather belts, the material or agents most generally used are benzine, naptha or gasoline, or turpentine. Sometimes one or the other of these alone, and at other times a mixture composed of some two or more of these agents, is used, the object being always to take out the surplus grease or fatty matter, and at the same time do as little harm to the fibre of the leather as possible. Benzine alone is probably more generally used than any other individual agent, and, generally speaking, it is probably the best thing that can be used for cleaning leather belts. Some make a mixture of three parts benzine and one part of turpentine; others use gasoline and turpentine in the same proportion, and others, especially where gasoline and benzine are regarded as too dangerous substances to have about the place, use turpentine alone for loosening up the dirt and taking out the grease.

In some of the large mills, where close attention is given to all details, it is the practice to have a room or little work-shop fitted up as a sort of belt hospital or general repair place. Then the care of practically all the belts in the institution is turned over to some one man, who will generally give them the attention they require in a deliberate and workmanlike manner, and not have to rush through his work or do it at night and be handicapped by insufficient light and other difficulties of doing a job of this kind in the dark. Other institutions less pretentious, but with an equally fair share of up-to-date ideas, make provision at some convenient point in the factory for working on belts. They have a special bench fitted up with all manner of tools they are likely to need, and various other conveniences for giving the afflicted belts their proper treatment. There are many others, however, where about the only thing that is provided to take care of belts is belt punches and lace leather, and it is in such institutions that we find the strongest disposition to give attention to belts by tightening only.

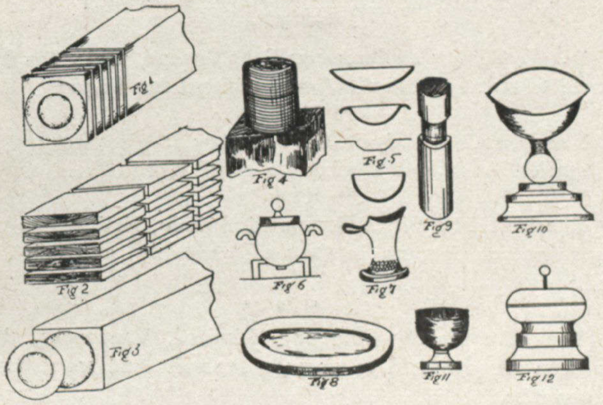
Some day we will reach the point in the care of belts where both propietors and employees will recognize the fact that while belts may not need attention as frequently as saws and planing knives, still they do need it occasionally, and their needs are, in a certain measure, as important as those of the saws and knives. It will mean money saved to have an equipment about the place for properly caring for belts, just the same as we have filing and grinding-room equipment for the care of saws and knives.—C. T. J.

—Look for hot boxes the last thing before shutting down at night. Probably nine-tenths of the fires that occur in woodworking establishments come from hot boxes. There should be some person about every wood-working plant whose special business it is to look after the boxes, and he should be held as strictly responsible for this work as is the night watchman, who has the card punched for every time that he winds his clock. After going his rounds the caretaker should report to the proper person the condition of every box and bearing about the concern. The operator of every planing or molding machine should know for certain the condition of every box and bearing about his machine before he leaves it.

WOODEN DISHES.

There is always a lively demand for various descriptions of wooden dishes. The bakeries buy a great many wooden plates every season for pies. Butter manufacturers and distributers consume thousands of dozens of wooden dishes annually, says Hardwood Record. In Canada the increasing tendency of the people to enjoy picnic parties is another source of demand.

While wood of tough, elastic and firm fiber should be chosen for the manufacture of hardwood dishes, we often find that some very inferior woods are used. In fact, some of the so-called hardwood dishes are made from cheap grades of softwoods and finished and polished like hardwoods. White woods, beech, maple, etc., are used extensively. Maple is preferred, but this wood cannot be obtained in every community readily and other varieties are often used. The object is to get a firm dish, free from any odor of the wood. Numerous samples of wooden dishes shaped from various woods are



made, but are not marketable except for special purposes, due to the odors of the wood adhering to the fiber, regardless of baths to remove it. The wooden dish intended for butter, lard or other article of food, must, of course, be devoid of any taint. Neither can there be any substance in the wood which might discolor foods.

There is much to be considered in the selection and assorting of the wood to be used and in the making of the dishes. Many dishes are placed aside as "seconds," even though made from the right wood, if they show knots or adhering pitchy substances, rendering the dishes unfit for placing among the choice or first selection. The seconds sell at reduced prices and are used for packing materials that are not affected by odors.

Wooden dishes are being used for many purposes aside from that of packing for commercial ends. They may be seen in use in the "hurry-up lunch rooms," where the thin, cheap plates are used once and thrown away. People making auto trips buy lunches put up with wooden dishes for use en route. Tourists do the same.

As to the manufacturer of hardwood dishes, after the wood is selected it is cut into convenient shapes for handling. There are two essential divisions of the work, one of which involves a cutting-out operation to make the form of the dish, and the other involves a pressing or squeezing operation, by which the form of the dish is compressed into shape. Then there is the veneer dish, fastened together at the corners with wire staples. The logs for the making of the cut dishes are taken to the mill and blocked off into flitches, either in the form shown in Fig. 1 or in Fig. 2. Or the dishes are cut out one by one from the solid block, with cutting blades, so that they are separated singly, as in Fig. 3. The blocks from the processes in Figs. 1 and 2 are intended for the turning of substantial wood dishes for table purposes. The thin butter and pie plates are made from veneer in quick time, or turned out from the solid piece with special machinery.

When the blocks are furnished as in the first views, an opportunity is given workmen to produce some artistic dishes for table purposes. In recent years there has been a large call from wealthy people who desire to fit out rustic rooms in country residences where the furniture is made of rough lumber with the bark left on. Such an equipment usually includes some artistically engraved hardwood dishes, which are purchased plain, as a rule, and are turned over to the wood engraver to ornament.

Automatic cutting machines are, of course, doing away with much of the handiwork formerly required. These machines can turn out good plates at high speed. There is a gripping contrivance on the carriage, and this device holds the block and feeds it. The knives cut the disks from the face of the block, one after the other, something after the order shown in Fig. 4. In Fig. 5 are shown different types of dishes required by the present market. There are many special designs needed every season, according to the requirements of the packers and the housewives who use wooden dishes.

Frequently the automatic machinery has to be dispensed with in order to fill certain orders for urns of the style shown in Figs. 5 and 6. Manufacturers of certain goods may desire a special type in which to pack goods for the market. They are always looking for packing contrivances that will catch the public. Hence we find in every firstclass wooden dish-making establishment a room in which special packages are modeled for the patent medicine man or the dealer in articles which require attractive packing for the retail market. Often trifles are purchased for the sake of getting the package. A certain candy is selling very freely throughout the country just now bcause many children want the handy, little barrel used for packing.

In Fig. 8 is shown one of the heavy dishes turned out of hardwood and finely polished. ome of the walnut and cherry dishes of this order are very pleasing to look upon; they are used as bread or salad dishes on dining tables. Fig. 9 is one of the little wooden tubes of which many are made every year. There are a few stand-dishes like that exhibited in Fig. 10 manufactured, also drinking cups, as shown in Fig. 11, and covered devices of the class shown in Fig. 12. The field is unlimited, and many manufacturers are making money from the production of wooden dishes and packages.

TIMBER TESTING MACHINE.

Bridge builders and contractors for buildings which are intended to carry variable loads will find much of interest in a unique machine designed by the Government of the United States to help them to answer the question which comes up very often: How is the strength of wood affected by repeated shocks? At the present time no satisfactory answer can be given. To fill the need for information on this important subject a special form of impact machine has been designed by the United States Forest Service to investigate the behaviour of wood under repetitive loading, and it is to be built by the University of Washington at Seattle, Washington, and is to form a part of the Forest Service timber testing station operated in co-operation with the university. This machine will be provided with a 1,500 pound hammer, which can be dropped upon the wood specimens under test from any height up to three feet. It is so constructed as to be both automatic and autographic. The record showing the behaviour of the specimen under test is drawn on a long sheet of paper, which constantly unwinds from one cylinder and rolls up on another. This record is drawn by means of a pencil attached to the hammer of the machine. When the machine is started the hammer is automatically raised to a height previously determined, when it falls on the specimen, and continues to be automatically raised and dropped until the machine is stopped. From the results to be obtained from the tests made with this machine the Forest Service hopes to be able to devise more accurate and reliable methods for calculating the stresses which timbers used in bridges and other structures subject to repetitive loading have to stand.

Woodworking News from all Canada

Readers of the "Canadian Woodworker" are cordially invited to forward to the Editor items of interest to the trade, particularly those relating to the erection or extension of woodworking establishments.

Miller's sawmill at Pokiok, N.B., has resumed operations.

* * * *

Boyd Bros.' sawmill near Flesherton was burned. Loss, $1,500.

* * * *

The Crown Furniture Co., Limited, Preston, Ont., has assigned.

* * * *

Mitchell Bros.' sawmill at Berkeley, Ont., has been burned.

* * * *

Larose and Larose will start a sash and door factory in Montreal, P.Q.

* * * *

R. Cunningham & Son's sawmill at Port Essington, B.C., has been burned.

* * * *

H. Stead will establish in New Westminster, B.C., a launch building factory.

* * * *

J. and D. A. Harquail will establish a woodworking factory at Campbellton, N.B.

* * * *

A. Mercure's lumber mill at St. Cyrille de Wendover, Que., has been burned down.

* * * *

Shepard & Morse's sawmill at Hintonburg, Ont., has been damaged by fire at a loss of $1,000.

* * * *

A. Bolvin's sawmill in Indian Lorette, Que., has been burned down. Loss, $10,000.

* * * *

Brayden & Johnston will erect a sawmill at Canoe Creek Siding on Salmon Arm, B.C.

* * * *

The Nipissing, Ont., planing mills have changed hands and will resume operations shortly.

* * * *

R. B. Bissett's sash and door factory at Strathcona, Alta., has been burned down at a loss of $25,000.

* * * *

The Canadian Pacific Lumber Co.'s large sawmill at Port Moody, B.C., is now in full blast.

* * * *

The Sackville Woodworker Co., Sackville, N.B., have started construction on their new factory.

* * * *

The Joliet Match Company, Joliet, Ill., will put up a mill for making wood splints at Fort Frances, Ont.

* * * *

E. J. Young, Madison, Wis., and F. N. Norton, Medford, Wis., will build a sawmill at Indian River, B.C.

* * * *

The Laidlaw Lumber Co.'s sawmill at Sarnia, Ont., has been damaged by fire to the extent of $6,000.

* * * *

McWhinney's shingle mill at Eburne, B.C., has resumed operations, turning out 50,000 shingles per day.

E. Frogernan, employed in the Barchard box factory, Toronto, had four fingers badly ripped on a saw.

* * * *

W. G. Gorvett's planing mill at Arthur, Ont., has been burned down at a loss of $6,000, insured for $1,200.

* * * *

The Canada Furniture Co.'s factory at Woodstock, Ont., has started operations again with a full force of hands.

* * * *

The De Kleitz Piano Company, Buffalo, N.Y., will establish a branch factory in Ontario, probably at Guelph or Berlin.

* * * *

The John Murray Company, Limited, Vancouver, B.C., has been incorporated to operate sawmills and manufacture woodenware.

* * * *

F. W. Oke's new furniture factory in Peterborough is approaching completion. Operations will be begun as soon as possible.

* * * *

The Marmora, Ont., cooperage mill has been burned down. Loss, $20,000, partly insured. Sixty men are thrown out of work.

* * * *

Bristol, N.B., planing mill has resumed operations after a close-down of some weeks for repairs and the installation of a new engine.

* * * *

The J. E. Murphy Lumber Co., which owns sawmills and timber limits on St. Joseph's Island, has been granted a winding-up order.

* * * *

E. B. Dennison and Geo. Mayer, of Chicago, will erect a sawmill of 100,000 feet capacity on Smelter Lake, north of Grand Forks, B.C.

* * * *

Some incendiary started a fire at S. C. Smith's sawmill at Vernon, B.C., but the watchman discovered it in time and it was extinguished.

* * * *

The Malcolm Lumber Co. have taken over the business of the Telford Lumber Co. at Fairview, B.C., and are putting up a 50,000 feet sawmill.

* * * *

The Mundy Lumber Co., Revelstoke, B.C., have shut down their mill at Three Valley as they have large stocks on hand to meet the fall trade.

* * * *

M. J. Scanlon, of Minneapolis, is now completing arrangements for the erection of two large sawmills in British Columbia at a cost of $750,000.

* * * *

Davy's sawmill at Bancroft, Ont., has been destroyed by fire, together with about 1,000,000 feet of lumber. It is stated there was no insurance.

* * * *

The Canada Furniture Manufacturers, Limited, are considering a proposal to remove its headquarters from Toronto and centralize at Woodstock, Ont., or some other place.

* * * *

The Crystal Beach Company, Limited, has been authorized under Ontario charter to operate a saw and planing mill, and sash and door factory.

* * * *

An employee named Bedard, in the Riviere a Jaune Lumber Co.'s mill at Lake Beauport, Que., had his hand seriously injured on a circular saw.

* * * *

J. Guthrie, of the F. H. Rice Lumber Company, Victoria, B.C., will build a large sash and door factory at that place, with a capacity of 2,000 doors per day.

* * * *

The Rat Portage Lumber Co.'s mill at Kenora, Ont., caught fire in the filing-room a few days ago, but fortunately it was extinguished before much damage was done.

* * * *

A site has been purchased along the river front, between Aylmer and Hull, on which a large sawmill will be erected. We cannot at present give the names of parties interested.

* * * *

The Adams River Lumber Company, which is building a saw mill at Shuswap, B.C., will shortly begin work on another mill at Nelson. J. P. McGoldrick, of Spokane, Wash., is interested.

* * * *

The Fraser River Lumber Co., Limited, of Millside, B.C., are making good progress with the rebuilding of their mills on the Fraser River. The daily capacity will be 350,000 feet per hour.

* * * *

The Capilano Timber Company, Limited, Vancouver, capital, $300,000, has been formed to take over timber lands from A. B., S. M., and W. E. Nickey, and to manufacture and deal in lumber, etc.

* * * *

Clifford Murchie, an employee of the Fort Frances Lumber Co.'s sawmill at Fort Frances, Ont., fell on to a saw and severed his arm. His recovery is improbable through loss of blood.

* * * *

The Ellis furniture factory at Ingersoll, Ont., has been burned down. In the same fire a large quantity of maple and pine lumber owned by Sumner and Brebner, piano manufacturers, was destroyed.

* * * *

A. Dunn and Ed. Young's sawmill at Young's Point near Peterboro, Ont., was burned down. The saws were mostly destroyed, and the machinery in the engine and machine room damaged. The loss was partly covered by insurance.

* * * *

W. H. Cook, president of the Duluth, Virginia, and Rainy Lake Railway, purposes to establish a large sawmill and planing and box factory at Fort Frances, Ont. His associates are interviewing the Ontario Government with reference to a lumber tract.

* * * *

New York capitalists have purchased 16,000 acres of cedar timber limits on the north-east side of Vancouver Island for $300,000. They will establish a logging camp this fall and may erect a sawmill.

* * * *

The door and sash factory belonging to the estate of the late W. F. Forrest at Atwood, Ont., is advertized for sale. Tenders will be received by the Trusts and Guarantee Co., Limited, Toronto, up to October 10th.

The Lake Superior Corporation's sawmill and veneer mill at Sault Ste. Marie, Ont., were the scene of a serious fire on the 27th, and much valuable lumber was burned, but the buildnigs fortunately escaped serious injury.

* * * *

Morlock & Cline, Limited, Guelph, have been incorporated with a capital of $150,000 to manufacture and deal in furniture, interior fittings, upholsterings, lumber and veneers It wi'l acquire the business and property of Jas. A. Cline, Limited, and Morlock Bros., Guelph.

* * * *

Bush fires have been very bad last month in the vicinity of North Bay. At Callender the sawmills of J. B. Smith & Co., Darling & Sons, and the Temagami Lumber Co. were forced to shut down in order that the workmen might fight the fires threatening the town and the mills.

* * * *

The Palmer Piano Co., Uxbridge, Ont., has assigned. The liabilities are stated at $75,000, with assets of nearly $100,000. The assignee has ordered a continuation of work at the factory, as the company is really solvent. The embarrassment is believed to be only of a temporary nature.

* * * *

The White Bros. Lumber Co., a Michigan corporation capitalized at $2,000,000, has acquired timber limits on Kallanch River, Vancouver Island, to the value of $2,000,000, and will, if the United States Government places lumber on the free list, erect a sawmill near Alert Bay with a capacity of 1,000,000 feet per day.

* * * *

One of the finest sawmills in British Columbia is that now in course of erection by the Adams River Lumber Co. at Shuswap. During the past few months the company has expended no less a sum than $108,000, and when the machinery, which has been ordered, amounting to over $91,000, arrives, the company will be able to boast of one of the most up-to-date, well-equipped mills in the Province. They have already built seven miles of road to connect Adams Lake with the Shuswap Lake, and have at the present time 70 men employed. A gang of men are also at work building a road from the north end of Adams Lake up the Tum Tum River twenty miles.

SIDELINE WORK.

Some thrifty carpenters and cabinetmakers earn considerable extra money during the course of the year by what is known as sideline work. This consists in manufacturing special articles.

Almost every shop has more or less of a call for the designing and constructing of special devices and this sort of work always pays well. Many woodworkers have introduced a system of odd-hour work in their shops, solely for the purpose of making special contrivances for the market. There are times when the most thrifty shops experience idle hours, and sometimes days. Instead of laying off one or more men, the special work department is opened up, and various articles of household and general use are turned out. These articles are put on exhibition, and, as a rule, sold at good values.

In recent years there has been considerable of a request for articles for dens. There are few houses now in which there is no den. The den is the point of admiration of many hosts. The den is the place where considerable money is spent in order to have something different in it to attract and entertain. There are quaint receptacles for flowers and cigar ashes. There are novel designs in wall pockets. There are wooden jardinieres and colored articles and utensils of various patterns. Some of these devices are tediously but exquisitely engraved with wood cutting tools. Some are merely stained wood.

There are sets of furnishings bearing dragon heads. There are wooden ornaments carrying owls' heads and horns. There are snake skins stretched tightly and smoothly on a glistening panel of highly finished hardwood. In fact, quite an endless display of articles from the sideline shop may be observed. There are likewise wooden finger bowls, while various utensils constructed from selected woods may be seen on all sides. The artistic wood age seems to prevail. Of course all this kind of work means that the woodworking artizans have something to do along this line. Hence, the usefulness of an equipped shop for he work. In many cases the equipment consists only of a bench and a few tools besides a common turning lathe. In other cases one may see quite an elaborate outfit of machinery and tools for producing the artistically designed articles demanded at the present time.

One of the articles in common service is a wooden lantern cage, calculated for hanging on a porch or for use in a dull-lighted den or library. Sometimes these wooden cage light holders are hung in halls. The wood should be selected with a view of making a sombre appearance. Some black walnut cages which I saw were exceedingly novel and attractive as designed and finished. Of course, pine or any white wood might be used and stained. But the hardwood in its original state always appeals in hall ornaments of this class.

While it is the general rule to make only one article of each kind, so that each patron may have something different, it often occurs that it is advantageous to turn out a number of pieces of the same pattern. Hence the sides, ends, bot-bottoms and tops can be fret-sawed out in desired numbers. These parts are set up and fastened with wire nails and then the finish is put on. When made in this way, the expense is not very great. But like the single dress pattern, some persons will pay elaborately in order to be the sole possessor of that particular design. Hence, in some shops it is understood between the patron and the proprietor that the only article of the kind made on that pattern is sold to the customer. Hence the exclusive possession is a factor which is valued by the patron.

It is a good plan to make up a number of articles and place them on exhibition. Customers will be drawn to the shop.

—Located in the north-east corner of the Machinery Hall at Toronto Exhibition we struck up against a "camel," at once recognized as being the well-known trade mark of F Reddaway & Co., the sole makers of "Camel Hair" belting, of Montreal, P.Q. This company had a most attractive exhibit, showing a big 22-inch belt, also various and sundry methods of joining same, one method in particular drawing a large amount of attention, i.e., an 18-inch motor drive belt fastened with the Crescent joint, so arranged that half the belt was perfect on one side and again on the other, making it so that no "knocking" would arise over the pulleys. Their other line was also in full view and awaiting the call for emergency fires, all their unlined linen hose being specially coupled up with Toronto Fire Department thread.

POSITION WANTED—By first-class rotary sawyer, steam or friction feed, or as filer or general mill foreman; sober and steady; references furnished. Address Box 6, "Canadian Woodworker," Toronto.

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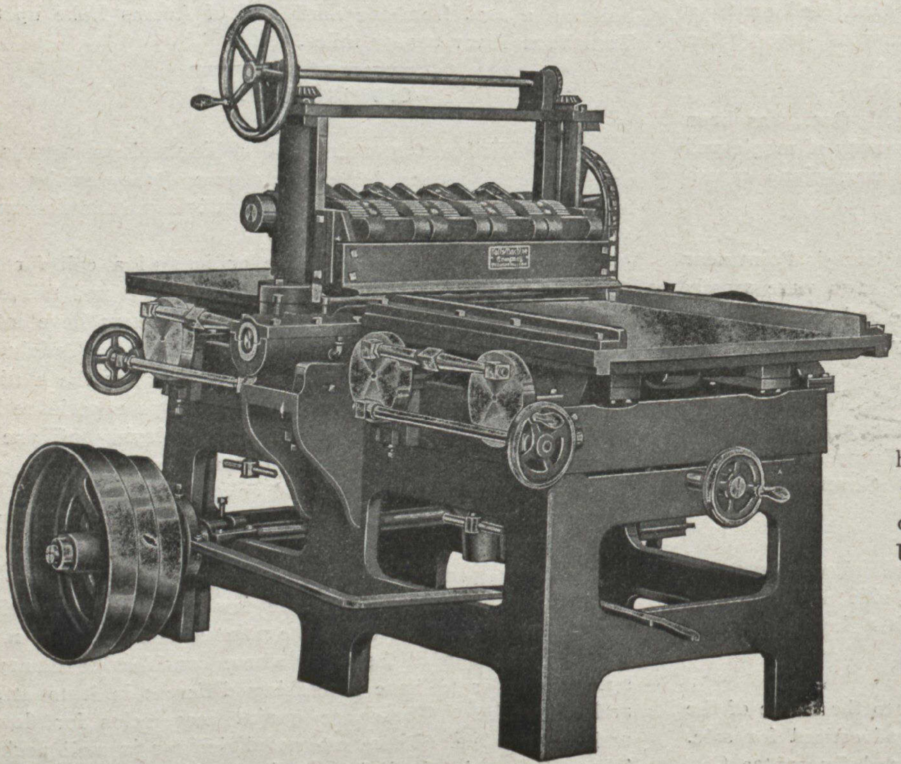

Feeds from 15 to 45 feet per minute. In feeding narrow stock through a 24-inch machine, for instance 4-inch stock, and feeding four pieces at the same time, the capacity at the end of the 10 hour day on the slowest feed would be 36,000 feet, and on the highest feed 108,000 feet.

Compare this with your present hand planer capacity. Would it not be worth your whileto make the change from the hand planer to the UNDERCUT?

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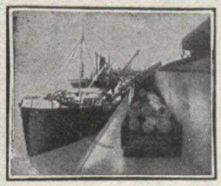

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73,000	ft.	Mahogany Crotch Veneers.
24,000	ft.	Cedar Crotch Veneers.
60,000	ft,	Long Figd. Walnut Veneers.
38,000	ft.	Figd. Walnut Butt Veneers.
87,000	ft.	Curly Birch Veneers.
312,000	ft.	Qtd. Sawn Oak Veneers.
71,000	ft.	Qtd. Sliced Oak Veneers.
93,000	ft.	Circassian Walnut Veneers.
138,000	ft.	Cuban Mahogany 1 in. to 4 in.
286,000	ft.	Afr. & Mex. Mahog. 1 in. to 4 in.
23,000	ft.	Circassian Walnut 1 in. to 3 in.

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WANTED

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THE SNOWBALL LUMBER CO.,
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WANTED

By end of August one band sawyer and one band saw filer, stating experience and wages expected. Apply
The DALHOUSIE LUMBER CO., Ltd.,
Dalhousie, N.B.

POSITION WANTED

A First-Class Spindle Carver wants position at once. Has had six years experience and is capable of doing any kind of work on the spindle Machine.
ORSON GASHMEIER,
Box 5 Bridgeport, Ont.

POSITION WANTED

First class mill foreman wants position. Competent in all classes of work in the woodworking line. First class on new work and detail work, and thoroughly understands the handl ng of help. Box 252 Canadian Wood worker, Toronto.

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Carriage Woodworkers wanted. The Baynes Carriage Co., Ltd., Hamilton, Ont.

MEXICO'S HARD WOODS.

"I was amazed at the almost infinite variety of woods of value to woodworkers that are growing in the forests of tropical Mexico," said a timber expert who recently made a tour of that part of Mexico. "There are several varieties of mahogany, cedar, oak, rosewood, ebony, dyewoods and endless other hard woods with Spanish names, but corresponding to our hickory, cherry and other fine American woods that are now extremely scarce and costly.

"Many of these tropical woods are as strong as iron. While the mahogany, cedar, rosewood and dyewood are well known to us through importations from there, the unknown varieties of woods that are just as valuable are quite as plentiful.

"Among these is one called zapote, which grows to a great size. Although the wood of this tree has peculiarly valuable qualities for lumber, it is seldom used in that way, the tree being valued merely as the producer of chicle, the sap which forms the basis for most chewing gum.

"The wood of the zapote tree is dark red and is easily worked until thoroughly seasoned, when only the finest edged tools will have any effect on it, and a sharp pointed nail is driven into it with difficulty. The fiber of the wood is so dense that the wood sinks in water like iron.

"In prehistoric ruins that abound in these Mexican tropics are timbers and door frames that are as perfect to-day as when they were first placed in position. The wood takes a magnificent finish, as do nearly all of these Mexican hard woods, and would be a rare article for the cabinetmakers."

ADVERTISERS' INDEX

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Sliced Mahogany		Sawn Mahogany	
1/30"	458,000 ft.	1/20"	35,000 ft.
1/28"	67,000 "	1/16"	10,000 "
1/24"	5,000 "	1/8"	27,000 "
1/20"	43,000 "	3/16"	10,000 "
Crotches	70,000 "	1/4"	3,000 "

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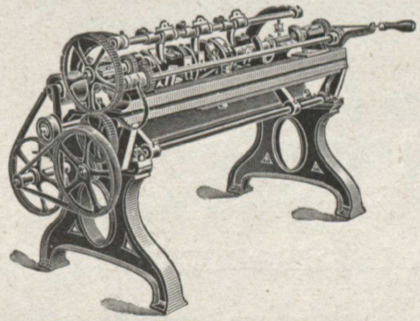

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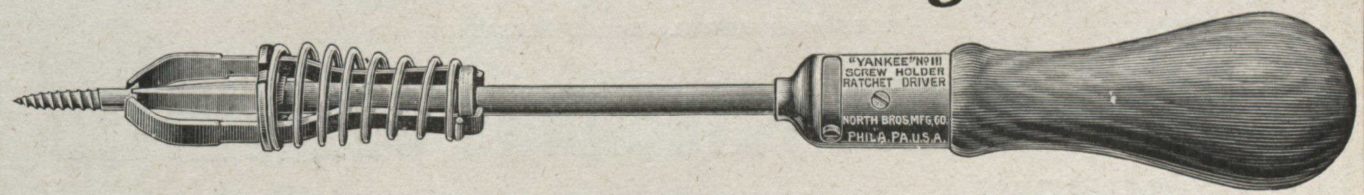

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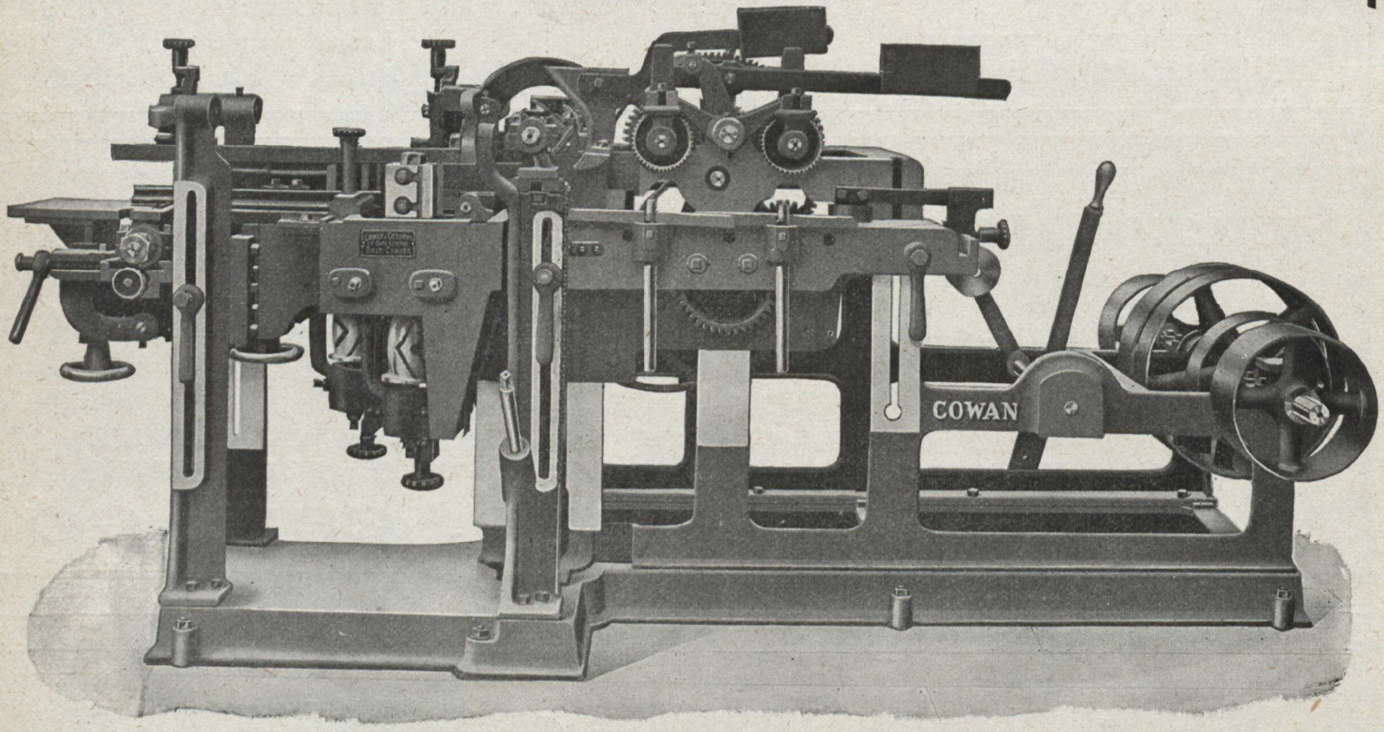
CANADIAN MADE



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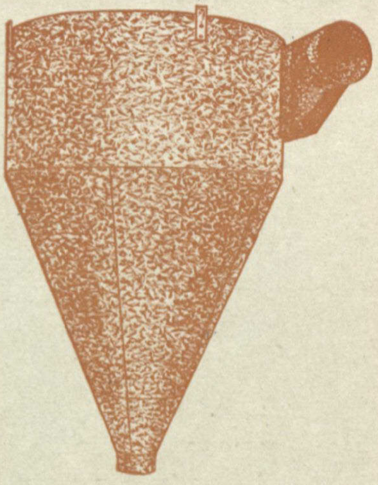

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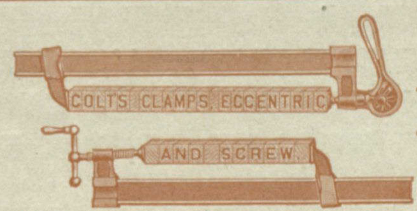

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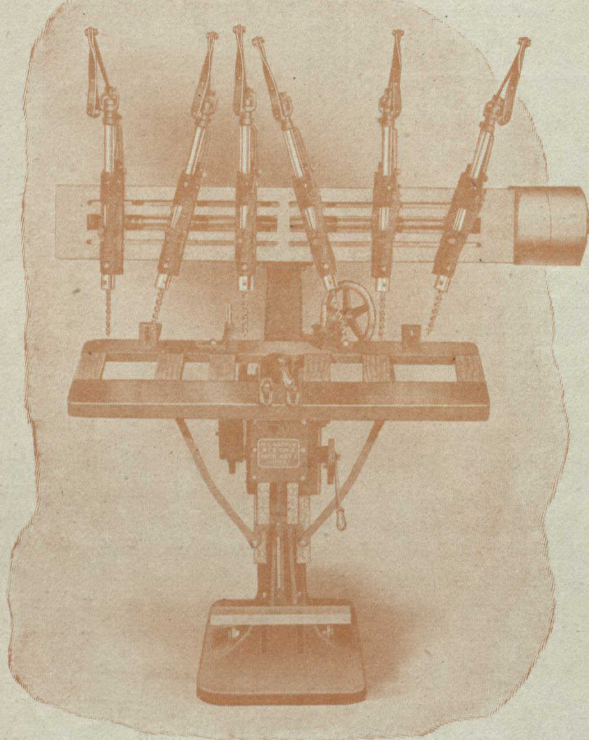

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The annexed cut represents M. L. Andrew & Company's patent improved combined straight and angle boring machine. Both spindles and table can be set either straight or to different angles to accommodate the most difficult boring. The machine is especially adapted to agricultural work, wagon, carriage, furniture and general manufacturing purposes. Machine is built in various sizes and with any number of spindles. Don't order any other make of machine until you have thoroughly investigated the merits of our machines.

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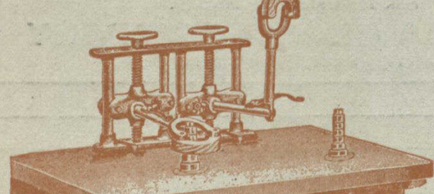

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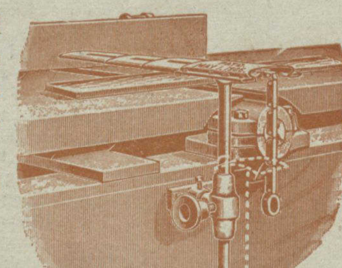

Jointer Guard
Dotted line shows it at side of machine for rabbiting.

The Jones Jointer Guard
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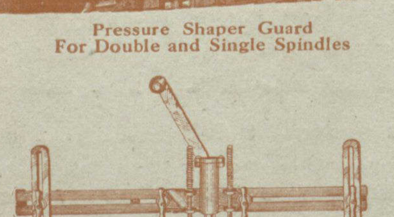

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