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BY THE WAY.

AN option held by J. T. Hurst and S. O. Fisher, two Michigan lumbermen, on seventy-two square miles of timber on the Walnapitae River, Georgian Bay, has been closed. The limits were owned by McArthur Bros., of Toronto, and the consideration, it is stated, is \$550,000. The expectation is that a cut of 250,000,000 feet will be realized from the property. Fifteen years ago, so runs the story, McArthur Bros. paid \$75,000 for these limits. The difference between \$550,000 and \$75,000 is a tidy sum. Would our Henry George friends take this as a case of unearned increment?

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Among several reasons given by a Chaudiere lumberman for the boom in lumber this year is this: "A feeling has suddenly grown up that the lumber trade has reached a kind of crisis, or, in other words, that the forest supplies have come to a point where they have turned on the down-hill grade towards depletion. Under such a belief, or fact, prices must keep up right along, and far-seeing lumber dealers are endeavoring to hustle in all the stock they can before the product market takes another jump." It is difficult to realize that such a crisis in lumber has yet been reached in Canada, though the period has been hastening undoubtedly by our prodigal treatment of the forests of late years.

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THE United States Congress has adjourned, but among the list of bills that received the official assent we do not find the Bryan free lumber bill. It vexed the bosom of our friends of the Northwestern Lumberman, and was the subject of columns of protests from certain lumbermen throughout the country, who thought they saw in it "a monster of such frightful mien," that were its provisions to become law the immense lumber business of the United States would immediately vanish into thin air. We are glad that relief has come to break the tension of anxiety which, along with the hot spell, was commencing to prove excessively overpowering. The man who wants his lumber on an easier basis is not in it this time, and must grin and bear his lot yet a little.

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THE American agent at Waubauskene, Ont., having raised the question whether rafts of saw logs shipped from Canada across the lakes to the States, being exempt from duty, are subject to the requirements of certified invoices, the authorities at Washington have quoted the provisions of section 4 of the act of June 10, 1890, which says no merchandise exceeding \$100 in value except personal baggage can be admitted to entry without a duly authenticated invoice or bond for the production of such invoices. There would seem to be no good reason why this regulation should not apply to logs. Its application does not carry with it the payment of duties, their exemption being already provided for, whilst an official record of the logs received in the States from Canada, would, for statistical and commercial reference, prove very useful.

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IN a little hand-book recently issued by the Western Retail Lumbermen's Association we have a good index of the business intelligence and strength of this organization. The membership embraces about 150 firms and the territory extends over the C.P.R. main line as far west as Indian Head and all their branches in Manitoba to their terminus; the N.P. railway in Manitoba and M. & N. railway to its terminus. The book before us gives full list of the members, constitution and by-laws of the association, and the inspection rules of the Northwestern Ontario and Manitoba Lumber Association, governing and grading white and red pine lumber. A freight tariff is not the least important feature of the

book. The association is one that means business and holds its members up to its by-laws under a penalty for breaking the price list agreed upon, so that if caught, they shall on conviction, pay the difference on the whole bill in question of the wholesale cost and the retail price at that point, into the funds of the association. Should a dealer refuse to pay on the second offence he will be expelled from that association and the Wholesale Dealers' Association, for it is a joint one, and the honorary members shall be notified by the secretary that such party is no longer a member. This latter notification is equivalent to saying: "Don't trade with him."

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Benjamin Harrison is not the only man engaged in the business of retaliation. To pay the United States back, in its own medicine, for placing heavy duties, under the McKinley Bill, on Australian wool, the legislators of the Antipodes have decided to retaliate against the United States by imposing a duty of \$6.25 on Oregon pine. Our British Columbia correspondent intimates that this action will no doubt stimulate trade between that province and Australia. We do not think that the fears entertained of British Columbia fir being included under the high tariff, because of a wrong understanding of names, need give anxiety. The tariff measure is leveled against the United States, and Australia can have no object in closing out our woods. The total exports of the products of the forest from Canada to Australia last year amounted to \$254,973, including pine deals to the value of \$12,950; spruce deals, \$45,853; laths, palings and pickets, \$4,942; planks and boards, \$187,591. This is not a very large trade, and will bear increasing, but it is to be remembered that the market in Australia has been severely depressed for a year and more and dullness still prevails. During the past year the United States exported to Australia, under the head of "wood and manufactures of," deals, boards and planks to the value of \$1,123,066; lath, \$16,317; palings, pickets and bed slats, \$10,727; shingles, \$1,125; box shooks, \$2,931; staves and headings, \$19,545; all other lumber, \$28,431, sawed timber to the value of \$206,754; hewn timber, \$3,229; logs and other timber \$1,260.

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It is the habit of some United States lumber journals to belittle the quality of Canadian woods, though the readiness with which American operators secure large holdings of timber in this country is a striking illustration of a contradiction in terms. But the best testimony touching the character of our timbers is that of the men on the spot who have an experimental acquaintance with our woods. Referring to parts of the Georgian Bay district, Michigan lumbermen, who are at work on the Vermillion, Whanapitae and Spanish rivers say that in size and extent there is no timber grown in their state that will equal the timbers of these territories. From the information that reaches us through our Michigan correspondent and from other sources there can be little doubt that United States lumbermen will put in a particularly active season in the Canadian woods the coming winter. We are losing the sawing of part of this timber because of it being towed to Michigan mills, but it becomes more apparent each month that these conditions will be altered in the near future. We intimated last month that the purchasers of the Dodge estate, a Michigan concern, who had intended towing their logs to their mills on the other side would now do the sawing in Canada. We hear of other United States firms who are seriously considering the problem whether it would not pay best to erect mills at various desirable points adjacent to their limits, saw their lumber here, and ship direct to United States ports by means of barge and tugs. The argument is that this would pay better than towing the logs over and afterwards shipping.

THE NECESSITY OF A STANDARD RULE FOR BELTING.

BY C. R. TOMPKINS, M.E.

THE question of the power that may be transmitted by leather belts has been so frequently discussed in the various mechanical and trade papers that it would seem as if some definite standard of value ought to have been established long ago. But still there seems to be as wide a difference of opinion between those who claim to be experts as ever. Each one seems to have his own theory, and sticks to it, whether correct or not.

One cause for this difference of opinion is in the amount of tension that a belt should be submitted to, for we are all well aware of the fact that the greater the tension the greater will be the frictional resistance upon the face of the pulley, but economy and durability in many cases are left out of the question altogether. It should not be a question of how much power can be transmitted by a belt of certain width, but rather how much power can be safely and economically transmitted by the same.

Here the main question arises upon which "doctors" disagree. One author says a belt one inch wide will resist a strain of 675 pounds, while another well-known author says: "A leather belt will safely and continuously resist a strain of 350 pounds per square inch of section." Now, while a good piece of leather belt one inch wide might support a weight of 350 pounds without breaking, this is no criterion to go by. A belt is never made of one solid piece of leather, but is formed by joining several pieces together by cement, rivet or lacing, and as the strength of all material is no greater than its weakest place, that point must be taken for the basis of all such calculations. Again, suppose a belt joined together by either process would stand a strain of 350 pounds to the inch in width without breaking, the question arises whether it is practical or economical to any belt at that tension. Take, for example, a belt 12 inches wide and subject it to that tension, the whole stress would be $12 \times 350 = 4200$ pounds, or two and one tenth tons. Now, I submit to any practical mechanic how long would a belt of that width last under that stress, or what would be the effect upon the journals and box of a shaft three inches or less in diameter that are so frequently driven by belts of that width. The question of how much stress will a leather belt stand without breaking is not the question to be taken into consideration in practice, but rather what is the most practical stress for economy and durability. Now, it has been demonstrated by numerous tests made by the writer that an average belt one inch wide, when joined together by either of the methods referred to, parted at a stress of 210 pounds, and this being the case, and it is conceded by all mechanical experts that in practice no body should ever be subjected to a strain greater than one-half its ultimate strength, it follows that in practical use a leather belt should never be subjected to a stress greater than 100 pounds to the inch in width, which, in the case of a 12 inch belt, the standing stress would amount to 1,200 pounds, which is all that should be required of it, and if the conditions are such that a belt of that width will not transmit the required power at that tension, rather than to increase the tension and destroy the belt, it is better and more economical in the end to increase the size of the pulleys and thereby increase the speed of the belt, for the power of a belt in all cases is the speed multiplied by the stress.

The power given out by a belt under a certain stress is another question upon which there is a wide difference of opinion. But this question is so easily tested by any one who will take the trouble to do so, it would seem as if it should have been settled long ago, and a definite standard arrived at.

For the benefit of any who may desire to satisfy