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THE CANADA LUMBERMAN

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HON. A. S. HARDY,

COMMISSIONER OF CROWN LANDS FOR ONTARIO.

HON. ARTHUR STURGIS HARDY, Q. C., Commissioner of Crown Lands for the province of Ontario, whose portrait we present herewith, is a well known figure among lumbermen, from the fact that he has had in his hands for a number of years the administration of a department with which they have had much to do. A brief sketch of his career will be of interest.

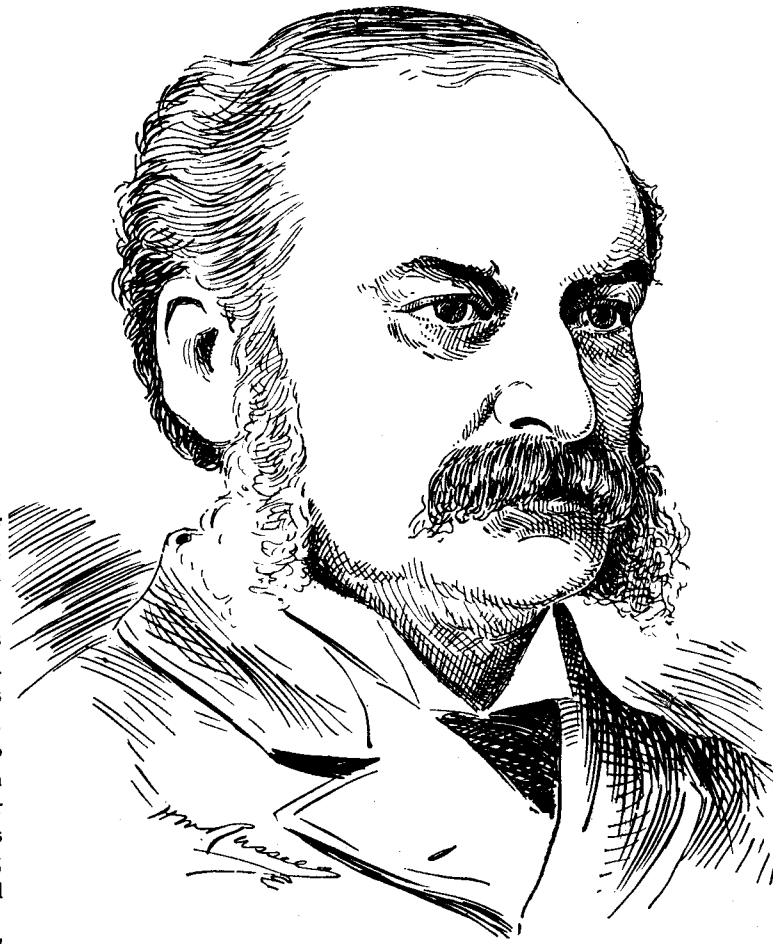
Mr. Hardy was born at the little village of Mount Pleasant, in the county of Brant, Ont., on the 14th of December, 1837. His father was Russell Hardy and his mother Juletta Sturgis, both of V. E. stock. Russell Hardy was a farmer at Mount Pleasant, but subsequently moved to Brantford and engaged in commercial pursuits. The subject of this sketch commenced his education at the school in his native village, and afterwards attended the Brantford grammar school and the Rockwood Academy. Having made up his mind to study law, he entered his uncle's office at Brantford, and afterwards spent some time in the office of the Hon. R. A. Harrison, afterwards Chief Justice Harrison, in Toronto. In 1861 he passed as an attorney, and immediately commenced practice at Brantford. In 1865, at Easter term, he was called to the bar. At that time Hon. E. B. Wood was the leading lawyer in Brantford, in fact he was one of the leading practitioners in Ontario. Sometimes called "Big Thunder," his elocutionary powers were known far and wide, and by means of the power which a strong mind exercises over weaker ones, he was able to sway juries almost at his will. But the young lawyer who had just passed was ready to face him. The first brief he held was in an important case, in which he was opposed to his powerful elder. Mastering all the details of his case, he presented it with marked ability, and won. Thenceforward his success was assured. His business grew, and a lucrative practice was rapidly built up. His success in criminal cases was remarkable. From 1865 to 1867 he defended no less than 16 prisoners charged with capital offences, of whom only one was convicted, and he did not suffer the extreme penalty of the law. In 1867 he was appointed city solicitor for Brantford, in 1875 he was elected a bencher of the Law Society, and in 1876 made a Q. C.

Such a man was almost certain to be called upon to take an active part in politics, and few resist the temptation. When Hon. E. B. Wood entered the government of the late Hon. John Sandfield Macdonald, in 1867, Mr. Hardy was urged to oppose him. He wisely declined, preferring to give his entire attention for a time to his profession. He, however, took part in the campaign, and it was largely due to his efforts that Mr. Wood's former majority was greatly reduced. In 1873, when Mr. Wood resigned to take the appointment of Chief Justice for Manitoba, Mr. Hardy took the field as a candidate, and was elected, after a bitter contest, over Mr. J. J. Hawkins, a strong local candidate, by a majority of 189. Two years later, at the general election, no one was found to oppose him, and he was returned by acclamation. He has since sat continuously for South Brant.

In 1877 Mr. Hardy entered the government of Sir Oliver Mowat as Provincial Secretary and Registrar. On the retirement of the late Hon. T. B. Pardee in 1889 he was transferred to the Department of Crown Lands, which he has since continued to administer.

Mr. Hardy early evinced those qualifications which

have contributed in such a marked degree to his success. While attending the Mount Pleasant school as a boy, he was fond of elocutionary exercises. He is a ready and effective speaker, a good debater, has a great amount of dash and fire, combined with attention to details, mental alertness and a pleasing manner. He is quick in detecting the weak points in an opponent's argument, ready at repartee, and can work in a humorous story with effect. He is withal a hard hitter, and where vigorous campaign work is to be done, is the member of the government usually selected. He is earnest and enthusiastic, a hard worker, and his administration of the crown lands department has been able and vigorous. Whether the policy pursued is the best for the country we leave for the politicians to decide.



HON. A. S. HARDY.

In the event of a vacancy in the premiership while the Reform party is in the ascendant, Hon. Mr. Hardy will be the coming man.

Mr. Hardy is a member of the Church of England. On the 19th of June, 1870, he married Mary, daughter of the late Mr. Justice Morrison, by whom he has four children. While his home is at Brantford, most of his time is spent at the seat of government in Toronto.

STRENGTH OF BRIDGE TIMBERS.

AT the fifth annual Convention of the American Association of Railway Superintendents of Bridges and Buildings, held at New Orleans in October, a report was presented by a committee which had been appointed to investigate the strength of bridge and trestle timbers, with special reference to Southern yellow pine, white pine, fir and oak. The report contains some very interesting facts for lumbermen. It appears from the tests applied that Canadian pine stands high up in its adaptability for railway bridges and trestles, the only woods which surpassed it being Georgia yellow pine and

Douglas yellow fir. Summarizing the conclusions of the committee we have the following facts brought out:—

Of all structural materials used for bridges and trestles timber is the most variable as to the properties and strength of different pieces classed as belonging to the same species.

The various names applied to the same species in different parts of the country lead to great confusion in applying the results of tests.

Variations in strength are generally directly proportional to the density or weight of timber.

As a rule, a reduction of moisture is accompanied by an increase in strength; in other words, seasoned lumber is stronger than green lumber.

Structures should be, in general, designed for the strength of green or moderately seasoned lumber of average quality and not for a high grade of well-seasoned material.

Age or use do not destroy the strength of timber, unless decay or season-checking takes place.

Timber, unlike materials of a more homogeneous nature, as iron and steel, has no well-defined limit of elasticity. As a rule, it can be strained very near to the breaking point without serious injury, which accounts for the continuous use of many timber structures with the material strained far beyond the usually accepted safe limits. On the other hand sudden and frequently inexplicable failures of individual sticks at very low limits are liable to occur.

Knots, even when sound and tight, are a cause of weakness both in beams and struts. They are detrimental to timber even in compression.

Except in top logs of a tree, or very small and young timber, the heart-wood is not so strong as the material further away from the heart.

Top logs are not as strong as butt logs.

Compression tests vary less for one species of timber than any other kind of test, and are therefore the most reliable.

Long timbers generally fail by lateral deflection or buckling when the length exceeds the cross section by 20 diameters.

Uneven end bearings and eccentric loading of columns produce more serious disturbance than is generally supposed.

Compound columns show the same unit resistance as each component stick.

More attention should be given in practice to the proper proportioning of bearing areas, in

other words, the compressive bearing resistance of timber with and across grain, especially the latter, owing to the tendency of an excessive crushing stress across grain to indent the timber, thereby destroying the fiber and increasing the liability to speedy decay, especially when exposed to the weather and the continual working produced by moving loads.

The strength of timber, the report points out, varies greatly according to the physical properties of different sticks of the same species, due not only to locality where grown but also to percentage of moisture, degree of seasoning, grain, texture, proportion of hard and soft fibres, presence of knots, etc.

The committee recommend further tests of the various timbers.

The results so far are eminently satisfactory as to the quality of Canadian pine, and must help to encourage its use for bridges and trestles.

The Sutherland-Innes Co., of Chatham, have assumed control of a large stave mill at Munising, Mich.

LUMBERMAN FOR SENATOR.

A WELL-KNOWN Buffalo lumberman, Mr. Abraham J. Elias, whose portrait is presented herewith, has received the Democratic nomination for Senator for the 47th Senatorial District of the State of New York. This district is embraced within the city of Buffalo. We notice that the candidature of Mr. Elias is endorsed by some of the leading lumber firms of Buffalo, including Mr. J. B. Wall, of the Buffalo Hardwood Lumber Company. This seems to be one of the best guarantees of Mr. Elias' fitness for the high position to which he aspires.

THE ST. ANTHONY CO.'S. MILL.

A YEAR and a half ago the country at the foot of Long Lake, an expansion of the Madawaska River, 144 miles west of Ottawa, was an unbroken forest. Now there is situated there one of the most complete and perfectly equipped saw-mills in Canada, and a thriving village growing up, containing an industrious community. This is due to the building of the Ottawa, Arnprior and Parry Sound Railway, which has opened up a district containing much valuable timber, that could not before be reached on account of its distance from railway communication. The railway is not yet completed, but work is being rapidly pushed, and it will be in operation, if no unforeseen delay happens, to Parry Sound next season. Meanwhile it is being operated to the end of the track.

The St. Anthony Lumber Co., which has built the mill referred to, is composed of Messrs. E. M. Fowler, of Chicago; Arthur Hill, of Saginaw, and E. C. Whitney, the manager, who makes his headquarters at Ottawa. Of course there have to be two or three other shareholders to meet the conditions of the law, which requires at least five persons to form a joint stock company, but the three gentlemen named are virtually the company. Mr. Whitney is a Canadian by birth, having been born three miles from Morrisburg, in the county of Dundas, but he has lived for 30 years in the United States, and gained his knowledge of the lumber trade at Minneapolis. He possesses much of that shrewd character and energy which is typical of so many of his fellow-citizens on the other side, and he will doubtless make the business of the St. Anthony Co. a remunerative one. He is a brother of Mr. Whitney, M.P.P. for the county of Dundas, and a prominent figure in the Ontario legislature.

The company purchased limits from Messrs. Pattee & Perley, the well-known Ottawa lumber firm, in 1892, and have since secured other limits, so that they have now nearly 400 square miles from which to draw their supply of logs. These limits are on the head waters of the Madawaska and its tributaries, and are said to be the best in Ontario. They contain a vast amount of white pine which has never been touched. Their property at Whitney, where the mill is situated, consists of some 1800 acres. Long Lake affords excellent storage facilities for logs.

The mill buildings consist of the lumber mill, 88 x 208 feet, a shingle and lath mill 48 x 50, a sorting shed 32 x 270, a boiler and engine house 72 x 82, and an electric power house 36 x 46. The lumber mill contains three band saws and one gang. The band saws are driven by an 800 horse power Milwaukee built engine and the gang by a 200 horse power Saginaw built engine. The electric plant has a separate engine of 75 horse power, built at Peterboro. Steam is supplied by 8 boilers, 60 x 20 feet each, having 18 six inch flues. There is also a 125 horse power boiler for the steam pump, but this is not fired when the mill is running. Saw-dust is used for fuel and the furnaces are fed automatically. The surplus and mill refuse is consumed in a burner 30 feet in diameter and 90 feet high.

The buildings are covered throughout with iron, no shingles being used whatever. The sprinkling system of fire protection is employed. No other mill in Canada has it. The boiler and engine house is fireproof.

The mill will cut white pine lumber, lath and shingles. It has a capacity of 200,000 feet per ten hours. The

output will be shipped over the Ottawa, Arnprior and Parry Sound Railway to the United States market.

The mill differs from all others in Canada and is provided with the most modern machinery. The logs are not touched by hand from the time they enter till they are sawed. The lumber is sorted automatically, and is taken from the mill to the piling ground on small cars, the facilities being such that two single horses can haul it all away.

In June, 1894, Whitney was a forest; on July 25th, 1895, the mill commenced sawing. It is the intention of the company to build up a model community. The business of the place will be kept in the company's own hands, and no outsiders will be allowed to locate on their property. The sale of whiskey will be strictly prohibited, and drunkenness, or connivance thereat, will be punished with instant dismissal. The men are at present accommodated in the company's boarding houses, but cottages will be provided for the married men, to each of which a quarter of an acre of ground will be attached, which the men will be obliged to cultivate. Some fifty such cottages will be erected. It is the intention to gather together an industrious and thrifty community, which will be characterized for sobriety and



MR. ABRAHAM J. ELIAS.

industry. There are 340 men employed at the mill and about 500 in the woods.

THE S. HADLEY LUMBER CO., LTD., CHATHAM, ONT.

THE S. Hadley Co., Ltd., of Chatham, Ont., do business in a large two storey brick building 60 ft. by 84 ft., situated on Wellington street. Their wholesale yard is on Thames street, on the bank of the Thames river, and the retail and storage yards are on Wellington street, one at their mill and one further down the street. On the ground floor is their engine room and lumber dressing room. The engine and boiler room, in one, is under the care of Mr. A. Jones, who has one assistant. The engine is a 45 h. p., McKeough & Trotter, makers, Chatham, and the boiler, by the same makers, is also 45 h. p. They intend putting in new engines and boilers. A dry kiln, with a capacity of 20,000 feet, is also on the ground floor, and was made by A. R. Williams & Co., Toronto. The same company have also placed one upstairs, having a capacity of 18,000 feet. The dry kilns are supplied by a Williams blower. The same blower heats the building with hot air.

The machinery on the ground floor consists of a double surfacer and planer, a large sticker, and a swing cross-cut saw. The machinery upstairs consists of a

large and a small sticker, a universal jig saw, and paperer and boring machine combined, a tread saw table, a shaper, a doweling machine, a blind and slot machine, a band saw, a tenoning machine, a large mortiser, a foot power mortiser, a tread boring machine, a turning lathe, and all the tools of a well equipped factory. A blower draws all the shavings from the machine into a 12 inch main and sends them to a 'cyclone' on the roof, when the wind passes out and the shavings shoot down into the shavings room or the furnace, at the will of the engineer, who controls their course by a slide which throws the shavings into the furnace pipe or the shavings room pipe.

The firm, consisting of three brothers, do an extensive trade in contractors' supplies and a wholesale lumber business. They also do fine woodworking, such as panels, mantels, and engraved furniture. They have a large list of customers and have been busy all season, and have good expectations of the spring trade.

A SAW MILL SUIT.

THE following suit recently came before the Court of Appeal for Ontario:—

MCNAB VS. TOWNSHIP OF DYSART.—Judgment on appeal by defendants from order of Chancery Divisional Court, whereby, owing to difference of opinion, directing judgment to be entered for plaintiff for \$200 and costs on High Court scale was affirmed. The plaintiff built a saw mill on the shore of Head lake, in the township of Dysart, upon or contiguous to the former site of a mill, and upon what he claimed was made ground, caused by reason of the deposit of a large amount of sawdust, refuse, and other stuff from the former mill, and not, as he claimed, to encroach upon any lands of defendants. The defendant Prust, the clerk of the said township, under orders from the corporation, entered and took down and removed the mill, and plaintiff brought this action for \$5,000 damages. The trial judge found that one-half the mill was built upon an allowance for road of defendants, and that a consent given by defendants for erection of mill had been duly and properly rescinded, but that the by-law so doing, not having been confirmed by the County Council, was without force; and that the other half of the mill was erected on ground leased by plaintiff from one Irwin, the owner thereof, and that defendants were not justified in interfering with such half. Appeal dismissed with costs. Watson, Q.C., for appellants. Steers (Lindsay) for plaintiff.

CHATHAM, ONT., ITEMS.

[Special Correspondence CANADA LUMBERMAN.]

THE S. Hadley Lumber Co., Ltd., Chatham, report that barn boards are in good demand at present and stock is good. The prices are firm, collections hard and business slackening off. They have had a successful season and have received a boat load, besides that coming by rail, every two weeks from Georgian Bay.

P. L. Barry has let his stock run down as he desires to sell planing mill and stock and retire from business.

J. J. Piggott & Son have had a busy season both in the retail and wholesale yards in Chatham and Windsor, and the planing mills are running long hours to keep up with orders.

Blonde Bros., lumber dealers and contractors, are ending up a successful season, though some of their work will not be completed till far into the winter. They have the carpenter work of the R. C. church at Goderich.

The water is low in the Thames river, making it difficult for boats with lumber cargoes to come up so far as Chatham.

The Sutherland & Innes Lumber Co. is said to be one of the largest and wealthiest in the world. Its headquarters are at New York and Liverpool, England. It operates 17 large mills in Canada besides many in the United States.

The value of the manufactures of wood imported into Canada and entered for consumption, during the month of October, was \$60,969, and the duty collected thereon \$13,863.45. The value of wood, cabinet makers, etc., imported for consumption, free, was \$62,753. The value of products of the forest exported was, the produce of Canada, \$2,903,977, produce of other countries, \$20,576, total \$2,924,553.

AN OJIBWAY DIARY.

WE present to our readers herewith a fac-simile of a couple of pages of the Ojibway diary recently sent in as a report to the Crown Lands Department at Toronto, and referred to in the last issue of the LUMBERMAN. The diary is written in lead pencil in a small book, and the fac simile is for the first part of the month of May, the dates of which will be seen on the margin. Sunday is marked by a cross, thus x. Ignace Dufond, the author, is a fire ranger on Mr. W. McKay's limits, and is a

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clever half breed. The Amable Dufond River is named after his father who lived in that section. The diary is all written in syllables and follows the phonetic system, regardless of rule, the syllable to express a certain sound not always being spelled the same. There is nothing to indicate the end of a word or sentence, so that it is rather difficult to read. Any of the readers of the LUMBERMAN who understand Ojibway can amuse themselves trying to make it out.

TIMBER AND FORESTRY.

LECTURE BY SIR HENRI JOLY DE LOTBINIERE.

THE Y. M. C. A. of Montreal, has recently inaugurated a course of popular lectures on the national resources of Canada, the first of which was given on the 7th of November, by Sir Henri Joly de Lotbiniere, the well-known authority on forestry, who chose for his subject "Our Timber and Forests." The following is a report of the lecture.

Canada, he said, though it was looked upon as the land of forests, only ranked as the fourth timber exporting country in the world. Sweden and Norway exported a larger quantity of timber than we did, as did also Russia and Austria. Canada's exportations in the way of timber consisted chiefly of pine and spruce, the former of which was now found mainly in Ontario, while the greater proportion of the latter was to be found in this province. In "Forest Wealth of Canada," published by the Federal Government, Mr Johnson, Dominion Statistician, expressed the opinion that the first quality of pine had disappeared, and though there was a considerable quantity of the second quality, still Canada was within measurable distance of the time, with the exception of spruce, as to wood, and British Columbia, as to provinces, when it would cease to be a wood-exporting country. To prove his statement that the first quality of pine was rapidly disappearing, Mr. Johnson had furnished figures from the cullers' return of 1865 to 1893, which showed that there had been a gradual decrease in the average number of cubic feet per stick.

Up to within a few years ago, said Sir Henri, we alone worked our forests, but now our neighbors to the south had kindly come in, and were demonstrating the activity characteristic of them by removing our pine trees, as was shown by the fact that out of seven hundred and forty million feet of lumber cut down in Ontario last year, two hundred and forty million feet were exported to the United States. Canada had lost the monopoly of her forests, and if the present ratio of destruction was to continue it would be but a very few years before the forests of our country would disappear forever.

He contended that it was not the cutting down of the logs from which the country derived benefit, but it was the manufacturing of them, and it was, therefore, essential that Canada should take such steps as would insure the manufacture of logs into timber within the Dominion. If the timber was manufactured here, it would afford employment to those young men who were now forced to beg their duty to posterity or to themselves when, having lost the flower of their forest almost completely, they allowed the little that remained to be taken away to the United States in order to be manufactured there. It was the duty of the present generation not only to hand down the Canadian forests to their posterity unimpaired, but in an improved condition. The pine forest of our land had almost disappeared, and great care must be exercised in the future if a total annihilation was not to ensue.

As to spruce, which was found in the Province of Quebec much more plentiful than pine, the great danger that threatened it was the pulp wood industry, which consumed enormous quantities each year. To supply the raw material for the 1,250 tons of ground wood pulp, chemical pulp and sulphide pulp, now used in the United States, about 2,200 cords of spruce per day were required. Every twelve months 100,000 acres of forest is cleared of its mature spruce, while nearly 4,700,000 feet of spruce logs are used up for this purpose every twenty-four hours, or upwards of 500,000,000 feet per annum. During the last ten years the pulp business in the United States had increased 500 per cent. Five years ago the ground product was estimated at \$12,375,000. It continued to be the great staple of paper manufacture. For its ordinary daily supply of paper the New York World requires all the marketable spruce fit to cut which grows on seven acres of average spruce forest, and the Petit Journal, published in Paris, France, with a circulation of 1,000,000 copies per day, consumes in a twelve month 120,000 fir trees of an average height of 66 feet. This was equivalent to the annual thinning of 25,000 acres of forest.

Last year the American manufacturers exported over \$2,000,000 worth of pulp paper. This was two and one-

half times the amount of their business in the same line in 1894. This year they expected that the amount exported would total a sum of \$2,520,000. The pulp industry in the United States alone, in its drain upon the spruce forests of Canada, used up these native imports of 100,000 acres per annum. Wheels, horse shoes, water pipes, pails, tubs, flower pots, domestic utensils and furniture of every description, protective armor to torpedo rams, bullets for rifle use, boots and shoes, bed clothes, apparel for the body, food products, alcohol and yarn, were now manufactured from pulp wood.

The lecturer contended that the forest should be studiously protected by legislation. In Canada, the Dominion Government was the custodian of the forests, the latter being Crown property. They could control the output and could bring legislation to bear upon the question of preserving them unimpaired for future generations. To prevent the rapid destruction of the spruce forests, Sir Henri recommended that the cutting down of young trees should be prohibited by legislation.

He explained the important part which the forests played in the economy of the world. They were necessary to the fertility of the country, to the success of agriculture, to the navigation of the rivers, and for those industries which require a regular supply of water. The forest preserved the rain among its roots, thereby lending moisture to the surrounding country. Used with a wise discrimination, the Canadian forests would last forever.

In conclusion, Sir Henri maintained that the cheapest way of propagating trees was by sowing the seed of the kinds required, and making regular nurseries, from which they could be transplanted to the forest. Thus, with comparatively little trouble and inconvenience, there could be restored to the older settlements a great deal of the forest wealth that had been wasted. As in the case of planting, great care should also be exercised in pruning. Every tree grown in the open would necessarily have to be pruned each year, and as in everything else, there was a right way as well as a wrong way of doing this. The limbs should be cut off even with the trunk of the tree. When this was done nature speedily healed the wound and the life of the tree was saved. But if a small portion of the limb was allowed to remain the result would be death and destruction to the tree long before nature, in spite of strenuous efforts to the contrary, was able to cover the wound with the protective bark.

A number of specimens, showing the results of good and bad pruning, were exhibited by the lecturer, who concluded his remarks by touching upon the benefits which would accrue from interesting the young in agriculture.

In replying to a vote of thanks Sir Henri added a few explanations with regard to the growing of pine from seed.

PUBLICATIONS.

It is announced that ex-President Benjamin Harrison is engaged in writing a series of magazine articles for The Ladies' Home Journal, in which periodical they will begin in the December number.

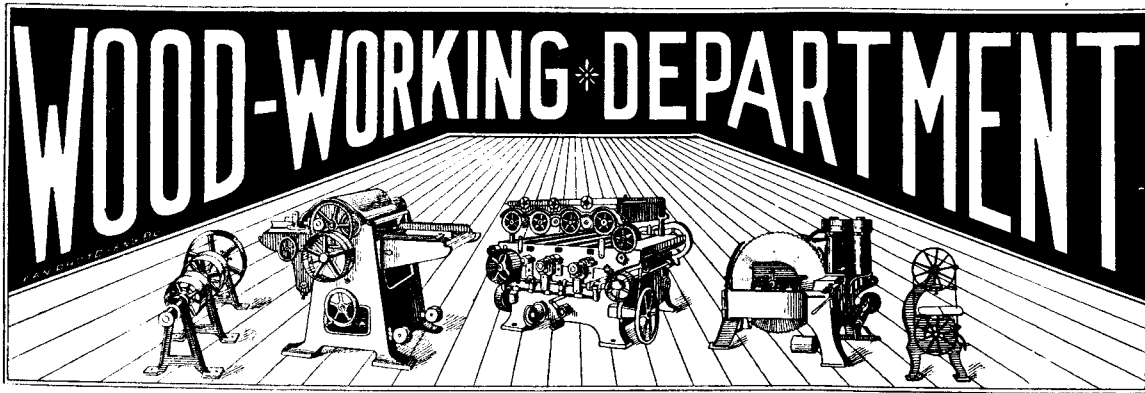
The Magnolia Metal Co., 74 Cortland street, New York, have recently published a new illustrated catalogue, containing results of tests by the United States Navy Department, Ohio State University, Cornell University, Mason College, etc., demonstrating the superiority of magnolia metal as an anti-friction metal. Its superior adaptability for machinery bearings in steamships, railroads, electrical, saw and rolling mill work, is proved by the numerous testimonials printed in this catalogue from companies who have tested its quality for these purposes.

People everywhere are standing aghast at the wondrous strides of the Family Herald and Weekly Star, Montreal. Certainly few Canadians were prepared to see a Canadian paper take the head of the procession and become such a conspicuous all-round favorite so soon. The Family Herald and Weekly Star, Montreal, is simply a marvellous production, and to think that it is only a dollar a year adds to everybody's genuine amazement. It is well worth while sending to the publishers, Montreal, for a sample copy, which we are told will be sent free just to enable people to see what can be produced in the newspaper line for a dollar a year. Few people will credit their own senses when they see it. Artists who have seen the premium picture to be given with the Family Herald this year ("Little Queenie" we think is the name of it) say that the premium is quite as wonderful as the paper itself.

WHAT IS SAID OF DODGE PATENT FRICTION CLUTCH PULLEY.

QUACO WEST, St. John Co., N.B., Oct. 29th, 1895.

GEO. H. EVANS, ESQ.,
Agent Dodge Wood Split Pulley Co., St. John, N.B.
DEAR SIR,—I have had one of the Dodge Wood Pulley Co.'s Split Friction Clutch Pulleys in use for the last month. It transmits so h.p in a stationary rotary saw-mill, and never slips or shows the least sign of weakness. It gives me perfect satisfaction in every respect.
Yours respectfully, (Sgd.) S. PATTERSON.



HIGH SPEED HORIZONTAL SAW FRAME.

THE illustration herewith represents the most condensed horizontal saw frame (for working at a high speed) which has hitherto been brought into the market. For years different firms have endeavored to produce a good machine of this class with partial success only, but Messrs. Kershaw Bros. claim to have in this machine accomplished the purpose which has been so much desired. Many representatives of large firms in the timber trade have seen it in actual work and express the opinion that it is the best devised machine for doing the class of work for which it is intended that has ever been brought to the notice of the trade. One great difficulty in putting down this kind of machine up to the present has been the great amount of space required, but in this example this difficulty has to a great extent been overcome, and it may be employed where the saving of space is a consideration. It contains a great improvement in having the driving crank for working the saw placed in a vertical position, which dispenses with all balancing. It also prevents the action of pushing down and lifting up of slide, and thereby considerably reduces the vibration, insures much greater steadiness in working, and enables the machine to be worked at a far greater speed than any other for the class of work for which it is intended. Another most important feature is that it dispenses with all compensating pulleys, thereby keeping the belts at one uniform tension, and saving much expense. The slide carrying the saw is raised and lowered by power (to suit the different thicknesses of boards to be cut), worked from the quick return motion shaft, needing no belt. It can be worked by hand if desired. The feed motion is driven from the vertical crank, and the belts for this never vary, therefore dispensing with compensating pulleys. The machine is entirely self-contained, and all the working parts are brought within easy reach of the operator. The construction of the machine is very simple, and so arranged that it is not liable to get out of order. The machine is well adapted to meet the requirements of cabinet makers, joiners and builders, railway wagon builders, saw mill proprietors and others.

A machine to cut 42-inch logs has just been completed and is in actual operation at the works, Hebden Bridge, Yorkshire, England.

A good engine in charge of a good man rarely requires to be stopped in working hours. When one is stopped frequently it would be a good plan to find out whether it is the engine that is out of order, or the man in charge of it.—The Engineer.

WOOD-WORKERS' LISTS.

By OWEN B. MAGINNIS.

I HAD intended writing up this subject before, but deferred it, hoping some other better hand than I might take hold of it, as the subject is one of interest and importance to many.

Foremen usually make out lists; that is to say, it devolves on them to pick and count out the number of pieces of stuff of different dimensions which have to be selected, sawn out, and wrought to a finished shape. Some of the more extensive establishments have a draughtsman, who is partly a mechanic, to do this work; but in the average shop it is the foreman's duty, and in this article I will endeavor to lay before him some sug-

gestions as to how this important matter should be done regularly and methodically.

Most work is made from standard patterns. When working from drawings which are furnished by the architect or designer, the foreman will, in many cases, be required to work out the construction in his own head, to economize the cost of construction, that the forms may come within the scope of the machinery in the mill. In addition to this, it may happen that he may reduce the cost of production by an analysis of the details, thus saving time and labor.

For example, in the trim, sash and door business, much lumber and working may be saved by a foreman who can change construction, and, by a judicious arrangement of the stuff, make the form fully adequate without injuring it. This is especially the case in hard woodwork, which of necessity must be economically

treated, owing to the high price of the material, and where a backing of pine is introduced to lessen the amount of hardwood to be used. When the prices of San Diego or red and white mahogany, quartered oak, cedar, maple, etc., are remembered, it can readily be understood why economical construction is of so much importance in modern wood-work, and how a foreman must treat the construction so as to save the expensive material.

Many foremen redraw the details in the constructive form they judge will be the cheapest to adopt, and by doing this they render them so clear in their own minds that making out the lists is a comparatively easy matter. This may either be done full size on manilla detail paper or on a drawing board, with all dimensions figured, and with the full laying out delineated, giving an elevation, with horizontal and vertical sections. Everything should be clearly shown, in order that a cabinet-maker or a bench-hand may at once grasp the method of putting the whole construction together, when the pieces are wrought by the machines and are brought to his bench. For doors and sash, a laying-out rod, as I once stated in these columns, will be sufficient, with a sketch of the elevation of the constructed detail; but for trim or difficult work, more explanation will be necessary. Laying out in pencil on boards is preferable to paper, because there is no danger of the drawing being torn or dirtied by use. After an experience of some years I would en-

dorse the board, although the paper has the advantage of being easily filed away for future reference; still, when it becomes torn or dirty its usefulness is so much impaired that it is hardly safe to refer to it again. Owing to the continuous handling in the mill, by some wood-workers with not too clean hands, paper working drawings get terribly mused, though they are often essential when the work is too large to lay out on a convenient board. I would suggest that where the board can be adopted, it is preferable.

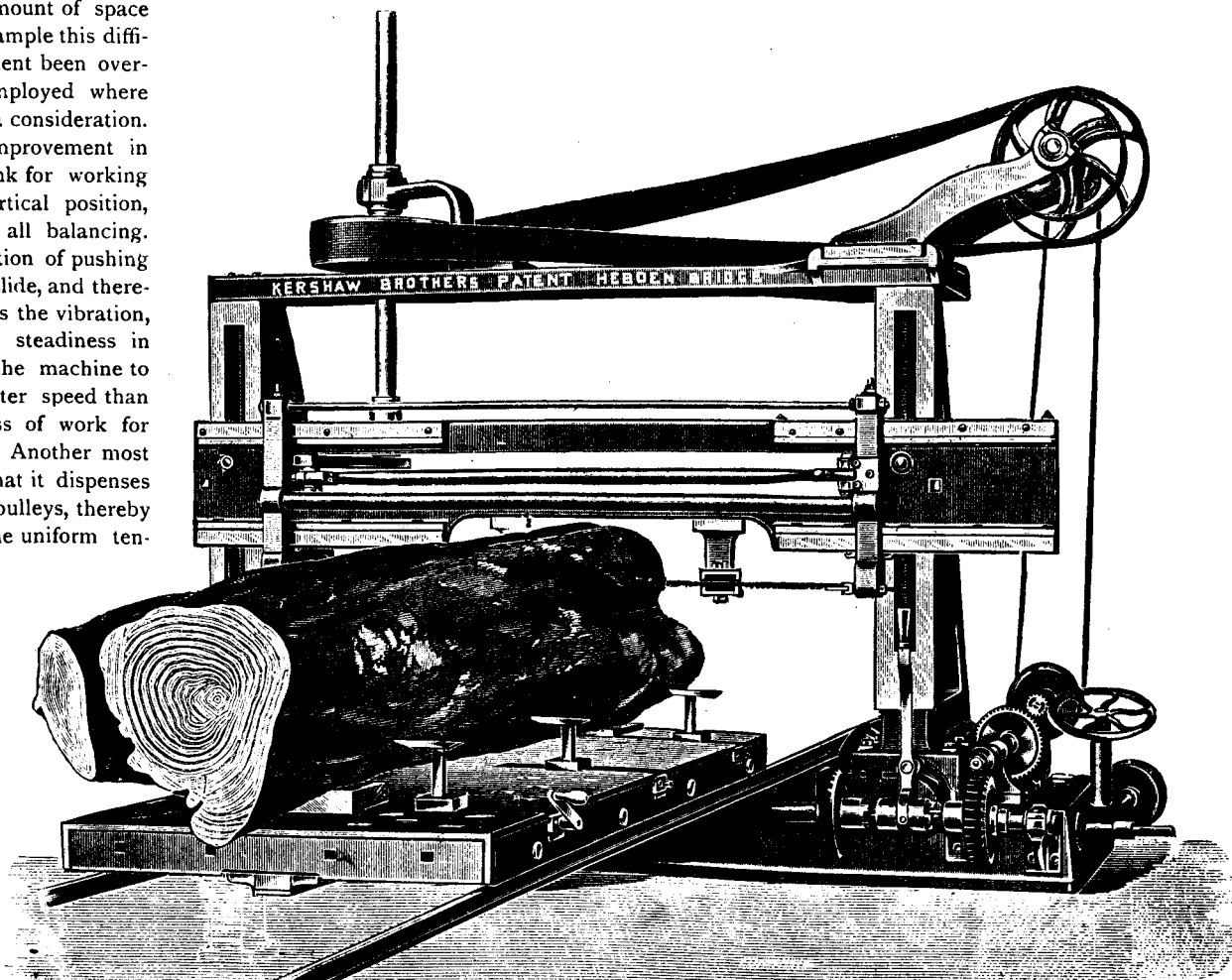
The foreman having laid the job out in a fully comprehensive manner, the next step is to prepare the lists, and here arises the necessity for another consideration on his part. I refer to over lengths. It will of course be understood that all pieces will require to be slightly longer than their finished lengths, also wider than their finished width, in order that there may be sufficient over-

stuff to permit them being worked by the machines. The extra stuff must be gauged by the foreman, and will be determined by his experience and former results; but there must be sufficient to enable each and every wood-worker to shape the pieces to the forms demanded in the layout.

I will take one simple detail of hardwood doors, and endeavor to explain the listing of the stuff necessary to be gotten out for their construction. Supposing one dozen veneered quarter oak doors have to be made to order, and that they are all of the same size, and of the following dimensions:

	Ft.	In.
Width.....	2	8
Height.....	7	0
Thickness.....	0	2
Stiles.....	0	5
Top Rail.....	0	5
Bottom Rail.....	0	11
Inside Rails.....	0	4
Panels.....	0	10 15-16
Thickness of Raised Panels.....	0	1 1/4
Moulding, Raised.....	0	1 1/4

Here we show the whole dimensions of the door



HIGH SPEED HORIZONTAL SAW FRAME.

Now commencing with the stiles, we find that they must have pine cores, with quartered oak band strip. The cores will require to be glued up in separate thicknesses to form one whole piece, which is done to lessen the danger of its working under climatic influence, which one solid piece would certainly do. The method of using pine cores glued up in pieces of $\frac{3}{8}$ or $1\frac{1}{2}$ -inch stuff, is therefore universally followed, so that the foreman will require to figure thus in his list, or, rather, to make out his list as follows:

LIST OF STUFF FOR 12 QUARTERED-OAK VENEERED DOORS FOR MR.

	For stiles: 24 cores out of 1-inch stuff, to finish 4 $\frac{3}{8}$ inches wide, 1 $\frac{1}{2}$ inches thick.
	For top rails: 12 cores, same stuff, to finish 4 $\frac{3}{8}$ inches wide, 1 $\frac{1}{2}$ inches thick.
PINE CORES.	For bottom rails: 12 cores out of 1 $\frac{1}{2}$ -inch stuff, to finish 11 $\frac{1}{2}$ inches wide, 1 $\frac{1}{2}$ inches thick.
	For inside cross rails: 48 cores out of 1-inch stuff, to finish 4 inches wide, 1 $\frac{1}{2}$ inches thick.
FOR FRAME VENEERS OF $\frac{1}{2}$-INCH QUARTERED OAK.	Stiles: 48 pieces, 7 feet 1 x 5 $\frac{1}{2}$ inches. Top Rails: 24 pieces, 2 " 1 - 0 x 5 $\frac{1}{2}$ " Bottom Rails: 24 pieces, 2 " 1 - 0 x 11 $\frac{1}{2}$ " Inside Rails: 96 pieces, 2 " 1 - 0 x 4 $\frac{1}{2}$ " All above to finish $\frac{1}{2}$ -inch less.
FOR PANELS.	48 pieces of plain oak, 11 x 23 inches of one inch stuff, to finish $\frac{3}{8}$ -inch. 96 veneers of quartered oak, 8 $\frac{1}{2}$ x 21 $\frac{1}{2}$, of $\frac{1}{2}$ -inch veneer.
PINE FILETS.	280 feet sawn pine filets, $\frac{1}{2}$ x 1 $\frac{1}{2}$ inches, to go under moulding.
QUARTERED OAK MOULDING.	290 feet 1 $\frac{1}{2}$ -inch raised moulding, $\frac{1}{2}$ inch thick, out of one-inch stuff.

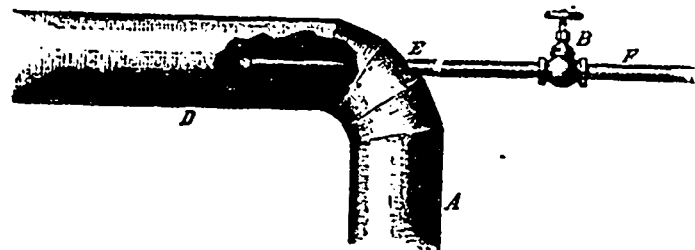
This is an approximate list of the stuff required for these doors, which, with the sketches I have enumerated, will be sufficient to enable the sawyer to cut out his stuff, and being passed from him to the planers, give them a full idea of the finished sizes. Sometimes the foreman will only give the finished sizes, relying on the sawyer to use good judgment in selecting and cutting up the stuff, but this method places a responsibility on the sawyer which many are not able to assume.

All lists should be returned for reference and kept clean.

In closing this article, I might say that it is submitted with the intention of placing before the fraternity a suggestion for this work, and I will be glad to welcome criticism, be it favorable or adverse, for the general benefit of all wood-workers.—The Wood-Worker.

SAWDUST AND SHAVING STEAM JET BLOWER.

At a mill at Walterboro, South Carolina, there was an exhaust fan to convey sawdust from the mill to the refuse pile, which always proved a source of annoyance, as it was in a secluded spot under the mill and very seldom got any attention. Mr. W. J. Taylor, who had to do with the mill, designed a steam jet blower, the construction of which the accompanying cut will explain.



SAWDUST AND SHAVING STEAM JET BLOWER.

He says: "I first got a six-inch galvanized iron elbow, cut a hole in same large enough to insert a three-quarter inch steam pipe at E. I then put on six feet of piping, A, which formed the suction. Then I made my discharge pipe, D, 150 feet long, and at one place the pipe had to be elevated to a height of eighteen feet to allow railroad cars to pass under. I then ran my steam pipe from boiler to within one foot of elbow, put on three-quarter globe valve, B, then twenty-inch steam jet pipe, C, made of three-quarter steam pipe, with opening at discharge end closed down to three-eighths of an inch, which forms the jet. I turned on steam and it very easily kept all of the sawdust away from the mill, and we cut on an average from twenty thousand to thirty-five thousand feet of lumber per day. This blower can be constructed of wood where metal piping cannot be easily obtained, and for an experiment will answer every purpose for a long time. Of course, it does not work

as well as the metal pipe, as there is more liability of its becoming clogged. Cheapness and efficiency are its chief points.

WOODWORKING IN JAPAN.

MR. R. L. Greenlee, of Greenlee Bros., woodworking machinery manufacturers of Chicago, who is making a tour of the world, has been spending several months in Japan, making a close study of the country and its people. The result of his observations is given in an interview with William E. Curtis, special correspondent of the Chicago Record. In the course of that interview Mr. Greenlee said:

I have been looking extensively into manufacturing while I have been in the country, and the result of my observation is a very strong conviction that the Japanese will soon be able to furnish themselves with all they use and wear and eat without assistance from foreign nations. They have very little woodworking machinery. Nearly all of the machinery I have seen in Japan, and nearly all the imported tools, are of English and German manufacture.

Lumber is worth about twice as much in Japan as it is with us. Common lumber, which we sell for \$10 and \$12 a thousand feet, will bring 40 yen—that is \$20 gold—here. This is due chiefly to the scarcity of timber and the great labor required to work it up by their primitive processes. They have been cutting timber off their mountains here for 2,500 years, and, although the forests have been reproduced again and again during that period, it is difficult and expensive to get logs down from the mountain sides in the absence of the necessary facilities. They usually go into the woods and cut one log at a time, which they haul out by hand or by oxen, for many miles. Where streams are convenient they use them as we do, but they have no saw-mills in the mountains, although there is an abundance of water power everywhere. I understand they have tried them, but they have not been successful.

They cut all their lumber by hand with a wide and thin saw during a time of year when they have nothing else to do, and each man who is engaged in business that requires lumber usually buys his own logs and cuts them up himself at odd times. Women and men both work at it. One man or woman will work on the top of the log while another works underneath, but usually not with the same saw. I have seen four or five men working on the same log, each sawing off his own board. They raise the log at an incline of 45 degrees, with one end on the ground and a rest about the middle, and when they work down to the rest they tie it up and begin at the other end.

All the lumber is dressed by hand. I have found but one planing mill in the country. That is at Yokohama. It employs about 150 hands, and, curiously enough, its entire product is made into boxes and shipped to India. It does no business in the local market. The machinery is all from Boston. The manager tells me that the company is thinking of enlarging the plant by adding a sash factory and machinery for making blinds and doors, also for the India market. I do not know why they do not sell their goods in the local market, but I presume there is a good reason for it; perhaps they get better prices in India.

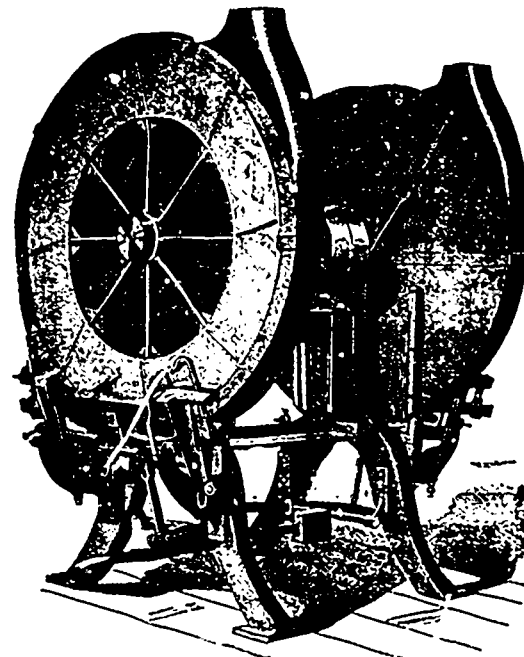
The Japanese make all the woodwork about a house by hand, and most of their houses are all wood. They are very skillful in all kinds of cabinet and joiner work, and are more rapid than our people. Their tools are better adapted for doing close work than ours, and are kept very sharp. Besides, they give a great deal more patience and labour to an article than our carpenters and cabinet makers. You never see scratches from nicked tools in their planed work. They use very few nails, but mortise almost everything. It is usually so well done that it is difficult to detect the joints except by the grain, and it lasts for ever. Some of their ships are made without a bit of iron in their composition. Everything is mortised.

The Japanese are very skillful in handling machinery when once they learn how. They learn best by imita-

tion. It is difficult to make them understand how to use a machine by explanation, but if they can sit by and see some one else do it they will learn very rapidly. And in copying machinery they reproduce the original with great exactness and fidelity, even to any blemishes or ornaments that may appear. I have seen some remarkable examples of their imitation. Usually the finish is a little rougher than the original, but the working parts are identical, and they get the finish all right after a little experience.

COMBINED FAN AND STAVE-JOINTER.

WE herewith present an illustration of the Holmes combined fan and stave jointer. One of the objections to all stave-jointers driven by power is the dust and shavings made, the removal of which demands constant care and expense, and occupies a large amount of valuable room, while the air in the entire building is completely filled with dust, destroying the health, comfort and clothing of all who are compelled to remain therein, at the same time forming one of the most dangerous tinders for the reception of sparks, taking up the oil from the boxes and journals, inducing crustation, heat, ignition, and not infrequently destructive conflagrations. All the dust and shavings are blown by the fan-jointer through conductors to the fuel-room, free of



COMBINED FAN AND STAVE JOINTER.

expense. This machine is built double or single and of sizes to suit from kegs to barrels, each wheel has its own shaft, tight and loose pulleys, and runs independent of each other.

The wheels being overhung, there is nothing to prevent the light from striking the face of the wheel from all directions, and giving the operator a full view of the stave he is jointing. No oil dripping upon the operator as he performs his work, as in jointers where wheels are in-hung. Full view across face of wheel in setting knives, as the shield is flush with face of wheel. Rim of shield, cast iron, and back of sheet iron, consequently no wear out to it.

The patent clamp used on the machine is claimed by the manufacturers to be the quickest, simplest and easiest acting clamp in the market, of great power and strength, holding the stave firmly, taking the wind out of crooked stock, presenting it to the wheel and releasing it as the clamp drops to its rest. More or less bilge is secured by simply moving two set-screws and raising or lowering the clamp. Bevel is changed by two set-screws, which move the foot of the clamp in or out. Hooks are adjustable to different lengths of stave in a moment's time. Double independent jointers, or both wheels on same shaft, as customer desires, the difference in price being slight. All size of jointers are made.

The machine is made by the E. B. Holmes Machinery Co., Buffalo, N. Y.



MONTHLY AND WEEKLY EDITIONS

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ADVERTISING RATES FURNISHED ON APPLICATION

The CANADA LUMBERMAN is published in the interests of the lumber trade and of allied industries throughout the Dominion, being the only representative in Canada of this foremost branch of the commerce of this country. It aims at giving full and timely information on all subjects touching these interests, discussing these topics editorially and inviting free discussion by others.

Special pains are taken to secure the latest and most trustworthy market quotations from various points throughout the world, so as to afford to the trade in Canada information on which it can rely in its operations.

Special correspondents in localities of importance present an accurate report not only of prices and the condition of the market, but also of other matters specially interesting to our readers. But correspondence is not only welcome, but is invited from all who have any information to communicate or subjects to discuss relating to the trade or in any way affecting it. Even when we may not be able to agree with the writers we will give them a fair opportunity for free discussion as the best means of eliciting the truth. Any items of interest are particularly requested, for even if not of great importance individually they contribute to a fund of information from which general results are obtained.

Advertisers will receive careful attention and liberal treatment. We need not point out that for many the CANADA LUMBERMAN, with its special class of readers, is not only an exceptionally good medium for securing publicity, but is indispensable for those who would bring themselves before the notice of that class. Special attention is directed to "WANTED" and "FOR SALE" advertisements, which will be inserted in a conspicuous position at the uniform price of 15 cents per line for each insertion. Announcements of this character will be subject to a discount of 25 per cent. if ordered for four successive issues or longer.

Subscribers will find the small amount they pay for the CANADA LUMBERMAN quite insignificant as compared with its value to them. There is not an individual in the trade, or specially interested in it, who should not be on our list, thus obtaining the present benefit and aiding and encouraging us to render it even more complete.

THE SOUTH AFRICAN TIMBER MARKET.

THE recent enormous development of gold mining in South Africa has had the effect of giving a great impetus to the timber trade at the Cape, and a good deal of attention is being paid to the possibilities of that country as a market for our timber. British Columbia has exported a considerable quantity this season, and is naturally scanning the possibilities of the future.

There has been an abnormal inflation in the value of mining shares, many of which are quoted at prices far beyond their actual value. A crash is sure to come before long, and how far mining will be carried on afterwards is so very uncertain that the lumber trade depending upon it is precarious.

Up to the present Cape Colony has been practically a non-producing timber country, though she has stores of forest wealth in the interior. Although Cape Town, the principal city, was built many years ago, the country around has only been developed recently, and the import of timber to any extent is the growth of the last ten years. The demand has been supplied principally from Sweden and Norway, the former having sent double the quantity last year over the preceding year. About four years ago a firm operating on Puget Sound determined to have a share in this growing trade, and sent a trial cargo. The experiment was not a success, but it established the fact that if properly managed a large and remunerative trade could be built up, and since that time a considerable trade has been carried on, at first by means of small sailing vessels, and subsequently by large steamships, which carry as much as two or two and a half million feet.

One serious drawback to the trade is the fact that the inland buyer requires to have the goods delivered on his premises by the seller, and railway freight rates from coast points—Delegoa Bay, Port Elizabeth, etc.—are very high, for instance 5s. 9d. per 100 lbs. actual weight. Besides, there is the risk of demurrage at the port of discharge, as well as duty, landing charges, etc., with

the risk of rejection on arrival. The dealers there are not disposed to buy f.o.b. or c.i.f.

As already stated, South Africa has great forest wealth of its own. With the growth of the country this will be developed, in fact the government, naturally desirous that as little as possible of the wealth of the country should go abroad, are taking steps not only to conserve the primitive forests, but to re-forest the denuded portions, and to that end has divided the country into four districts, with a conservator, rangers, foresters and other officials for each. In one of these districts, in 1894, 3,500,000 trees were planted at a cost of one half penny each, and in the other districts extensive planting was also done. All the railway ties required can be furnished at home, and a creasoting factory is projected, where railway timbers can be so treated as to increase their durability. Last year a large quantity of timber was brought in from the neighboring country of Beccuanaland, which is shortly to be annexed to Cape Colony. The chances are, therefore, that in the course of a few years the Cape will be in a position to supply most of the home market.

The mining boom has created a demand for timber of unusually long lengths, say up to 18 inches square and 60 feet long. The Pacific coast fir is admirably adapted for this, while the Baltic cannot furnish it. Hence, a share of the trade has been easily secured for the former. Much lumber for building is also consumed, as may be inferred when we state that the population of Johannesburg and surrounding district is increasing, by immigration alone, at the rate of from 1,000 to 1,500 souls per month.

So long then, as the present mining boom continues, with the resulting influx of population, there will be a large demand for lumber at good prices, but the future is uncertain, and therefore it is a trade which must be entered into with much caution and a great deal of risk.

CANADA'S LUMBER EXPORTS AND CONSUMPTION.

IF any of our readers ever thought of the matter they have probably come to the conclusion, without looking into the figures, that Canada, with her vast timber areas, exports more lumber than, with her comparatively sparse population, she consumes at home. Yet such is far from being the actual fact. She uses twice as much lumber at home as she sends abroad. A similar fact exists with reference to the New England states, where the home consumption is largely increasing. Is there not a lesson here, that we should be careful in the manner of disposing of our timber? While there can be no objection in encouraging our foreign trade, thereby bringing wealth into the country, we should not be too lavish in sending away what may in the future be required at home, at least there should be no waste, which it is to be feared goes on to a considerable extent in our forest products.

Another fact is of interest, namely, that we export considerably more lumber to the United States than to Great Britain. In 1893 our export of forest products to the mother country was \$11,105,482, while to the United States we sent \$14,841,455 worth. Yet though we sent abroad nearly \$26,000,000 worth of goods out of our forests our total production was \$80,000,000 worth, so that we consumed at home about \$54,000,000 worth, or more than \$11 per head of the population.

AMERICAN FORESTRY ASSOCIATION.

THE American Forestry Association, which recently held its annual convention at Springfield, meeting, by the way, in a church, had its attention called, by means of a letter from Secretary Morton, to a very prolific cause of forest fires, and a suggestion as to a means by which the danger might be minimized. He wrote:—

"It is very important that the American Forestry Association should formulate and commend to the various States a system regulating the clearing up of debris after cutting the large trees for timber. The devastation of the woodlands by fire could be avoided if each State would make it a penal offense to leave the brush not utilized for lumber lying upon the ground as kindling for the great forest fires. Until there be uniform legislation in regard to this matter the annual forest conflagrations will continue. It is deemed advisable that the

Geological Survey and the Division of Forestry cooperate in mapping and determining the value of the national forest reserves. The Geological Survey might continue its topographic mapping of the national forest reserves and locate all areas suited to the purpose. This is already authorized by law."

We in Canada might gain a hint here.

EDITORIAL NOTES.

HIGH freight rates and lack of tonnage, with possibly a little slackness in the market, caused a falling off in the lumber which passed through the Soo canal, United States side, during October, of nearly one-third. The figures for 1894 were 108,274,000 feet, for 1895, 77,263,000 feet. It does not take much to change the current of trade.

AT the recent annual convention of the National Association of Builders of the United States, a resolution was offered calling upon the Secretary of the Interior to enforce all laws looking to the protection of the public forests from unnecessary and wanton destruction; also urging upon the governors of the several states the recommendation of legislation in their annual messages looking to the preservation of the forests.

A PECULIAR law suit was recently tried in Wisconsin which will interest lumbermen who drive logs down streams. The plaintiff had given a boom company the right to overflow his land, and in the course of operations some of their logs floated over his property, so he sued them for storage. The court gave judgment for the company, holding that the stream, in its widened condition, was a public highway, open to all. So this enterprising individual saw his prospective source of revenue ruthlessly cut off.

THE railways of Maine are reaching out for business in the northern part of the state. While spruce is the staple lumber of that state there is a good deal of hardwood, which has been unavailable because it was not practicable or economical to attempt to drive it on the rivers, and accordingly the market was supplied from what could readily be loaded on the cars. But the railways are penetrating further and further every year, and developing a lumber business which could not otherwise have been done.

WHILE the Franco-Canadian treaty opens up a promising market for our timber, there is another European country with which we might cultivate trade to our own advantage, namely, Denmark. An official now stationed at its capital writes to this effect: "The opening of the free port of Copenhagen affords a good opportunity to American dealers. Lumber shipped in bulk can be stored at low rates in the ample yards of the free port and from there be distributed to the various ports of the Baltic, according to the demands of trade."

IT does not look as if there would be much use for soup kitchens this winter. Any able bodied man who is willing to work can find employment, for the demand for labor is, strange to say, greater than the supply. This may not be strictly correct locally in all instances, but there is work in the country, and if it cannot be found in one place it can in another. Lumbermen find it hard to get men for the woods. Particularly is this the case in Michigan and throughout the northwestern states. Last year the labor market was overstocked, this year the demand is greater than the supply. This is a healthy sign.

THE manner in which facilities for reaching the market enhances the value of timber properties is well brought out in a case which has come under our notice. About five years ago the owner of two hundred acres of land near Eganville, a small village in Ontario, offered it for sale to the owner of the neighboring property, the price asked being eleven tons of hay, delivered at Eganville, eight miles distant, hay being then worth twelve dollars a ton. The offer was declined, the land not being considered worth what was asked. The building of the Ottawa, Arnprior and Parry Sound Railway, which

passes within four miles, has so enhanced the value of about 150 acres of cedar, hemlock and hardwood bush upon it, that the proprietor has sold the timber for \$640 and still has the land left.

The growth of the pulp business is most remarkable and promises in the near future to outvie its past record. The consumption of paper has grown so enormously of late that immense quantities of pulp are required by the paper makers, and in addition it is used for a great variety of fabrics hitherto made from other vegetable or animal materials. The outside world is looking more and more to Canada as a source of supply, but the temptation to meet this demand must not lead to prodigality in dealing with her spruce timber. Some leading lumbermen advocate an export duty to check the outflow.

THERE are a good many moose destroyed in connection with the lumber shanties every year. The men shoot them, or they are killed by settlers and others, who sell them to the lumbermen for food. As the killing of moose, elk, reindeer and cariboo is absolutely prohibited in the province of Ontario till October 25th, 1900, in order to prevent their utter extermination, notice has been issued by the government that the law will be strictly enforced, and lumbermen have been cautioned against violations of the statute. We trust the warning will be heeded, for their own sakes as well as for the preservation of this species of game. The penalty for infraction of the law is \$50.

DURING the past season only about two-thirds the quantity of logs taken across from Canada to Michigan last year were floated over to be sawed in Michigan mills. Two concerns which put 100,000,000 feet of logs into the Georgian Bay last season will not have more than 25,000,000 feet this year. Some of our contemporaries in the United States do not like this, and object to free lumber, which allows their men to cut up their logs in Canada and take over the lumber without having to pay duty, but if a duty was to be imposed, Canada would simply be obliged in self protection to impose an export duty on logs, and they would be no better off. It is wiser all round to leave things as they are.

Two of the greatest fire fighters in America, Chief Bonner, of New York, and Chief Sweeney, of Chicago, have pronounced the sky scraping buildings of their cities huge fire traps, especially when their contents run largely to inflammable materials, and this although their construction is supposed to be fire-proof. The iron of such buildings is liable to expand and let the floors fall, causing a general collapse. Both these veteran fire chiefs pronounce in favor of buildings of brick and yellow pine. In such the fire burns more slowly, and there is a better chance of saving the contents. The dealers in yellow pine can afford to present these men with a handsome testimonial. They have given their business a valuable advertisement.

THE treaty between Great Britain, on behalf of Canada, and France, signed at Paris 6th February, 1893, came into force on the 14th of October, 1895. Under its provisions Canadian building timber in rough or sawn, wood pavement, wood pulp, flooring in pine or soft woods, furniture, staves, and wooden strips, when imported direct, accompanied by certificate of origin, will receive the advantage of the minimum of tariff on entering France, Algeria, or the French colonies. It now remains for Canadian lumber dealers to exploit this new field and work up a trade with France in our forest products. The importations of lumber into that country amount to about \$40,000,000 annually, of which Canada sends comparatively a small amount, the official figures for 1894 being \$117,682. Mr. Edward Jack, of Fredericton, N. B., who for years has been a student of French affairs, views the present situation as exceedingly hopeful, and suggests that the proper authorities send some one to France for the purpose of investigating the character, size and description of Canadian lumber which would suit the French market.



CHEAP wheat, oats, corn and potatoes do not encourage the farmers to launch out and erect new houses, barns and other improvements, thereby promoting the sale of lumber, but it does mean that poor people can have plenty to eat the coming winter, so I do not worry because the prices of farm produce are low.

I do not generally approve of monopolies, but Switzerland proposes to establish one which I am prepared to endorse. The government is the monopolist, but does not look for profit. It merely seeks a pretext for prohibiting entirely the manufacture of phosphorous matches, which produces disease and death to those engaged in it. Its results are said to be as bad as leprosy.

Some time ago I had occasion to visit a small saw mill which was worked by steam, and it struck me that the safety valve on the boiler was too heavily loaded. On enquiry it turned out that the man who was running it did not know much about safety valves or boilers, and a brief calculation showed that he was carrying a load of steam far beyond the safety point. I have no doubt there are many who have to do with steam machinery who cannot calculate the proper position for the weight on a lever safety-valve. To such I would commend a study of the interesting article on the subject to be found on another page.

Don't I wish I was a lumberman. They can talk of millions as glibly as I can about single dollars, and perhaps have a better right to. I read that Donald Grant, a Minnesota railway contractor, has, with half a dozen associates, secured a concession of 14,000,000 acres of land from Venezuela, and has organized a company with a capital of \$25,000,000 to work the limits, which contain some of the finest wood in the world, and are said to be worth \$50,000,000. The name of the chief promoter is of a Scotch flavour. I wonder if he does not belong to that canny race of which Max O'Rell tells such a good story as to their success in foreign countries. Well, if I cannot handle millions I am at least spared much anxiety, and with this I must console myself.

The canal mule and his driver are to be displaced by that ever encroaching power electricity. The test made at Tonawanda, in moving boats on the Erin canal by the trolley system, seems to have demonstrated its practicability, and the approval of Mr. Chas. R. Barnes, state electrician, a practical man of twenty years experience, has been given. Mr. Lamb, the inventor of the system, is receiving well deserved congratulations. Three and a half miles an hour at the start is a very good gait. I am pleased for the mule's sake, for few animals had a harder life than he, I am also glad for the forwarder's sake, for a saving of 88 per cent. in towing by mule and of 70 per cent. by steam is a consideration these hard times.

A CROP bulletin issued by the Department of Agriculture for Ontario recently reports a falling off in the hay crop this year of over 700,000 tons, which represents a loss to the farmers of more than the value of the entire wheat crop of the province. It also means something to the lumberman, for a short crop must result in high prices. But the price will not go up as it once did, for railways are great equalizers, and hay can be brought from where it is more abundant at a comparatively small cost for freight. But if the hay crop was light oats gave an extraordinary yield and are cheap, so that lumbermen will simply have to feed less hay and more oats. When the new steam logger comes into use the price of fodder will be of small moment. All it requires is wood and water, which can always be found on the spot. And

this is a world of compensations. Though hay for the horses may be dear provisions for the men are cheap.

MR. G. W. HOTCHKISS, a veteran lumber journalist, rather startled his companions on the recent Hoo-Hoo excursion to Duluth, by asserting that there were some present who would, before their business career terminated, handle African and Siberian lumber. He said that the great forest of white pine in the latter country, said to be 3,000 miles long and 1,000 miles wide, the only pinus strobus in the world, so far as known, outside this continent, would be cut into lumber and laid down in New York, when the Nicaragua canal and the trans-Siberian railway, the latter promised for 1897, are opened, at as low a figure as Pacific coast lumber can be supplied for to-day. As for Africa, while it is importing timber from America to-day, it has large forest wealth of its own, and the tide of business may soon be turned, as it has been in many another instance. Conditions change rapidly nowadays, and Mr. Hotchkiss' prediction may come true, and that before very long.

FORESTRY FOR FARMERS.

THIS is the title of a pamphlet lately published by the U.S. Department of Agriculture, the author being Mr. B. E. Fernow, chief of the division of Forestry, who is well and favorably known to Canadians interested in the important matter of which he treats. In this pamphlet he begins in a very logical way by showing how trees grow—their food, materials, growth, soil and light conditions, and physiology of tree growth. In treating of the question of "sap up and down," he says:—"The growing tree in all of its parts is more or less saturated with water, and as the leaves, under the influence of sun and wind and atmospheric conditions generally, transpire, new supplies are taken in through the roots and conveyed to the crown. This movement takes place even in winter, in a slight degree, to supply the loss of water by evaporation from the branches. In the growing season it is so active as to become noticeable, hence the saying that the sap is "up" or "rising," and when toward the end of the season the movement becomes less, the sap is said to be "down." But this movement of water is always upward, hence the notion that there is a stream upward at one season and in one part of the tree, and a stream downward at another season and perhaps in another part of the tree, is erroneous. The downward movement is of food materials, and the two movements, of water upward and food downward, take place simultaneously. In the part which describes how a forest is to be planted, the writer discusses the subject of what trees are to be planted, and the adaptability of the trees to climate and soil, the mutual relations of different species, with reference especially to their relative height, growth and light requirements. He makes the very just remark that "Mixed forest plantations (made of several kinds) have so many advantages over pine plantations (made of one kind) that they should be preferred except for very particular reasons. Mixed plantations are capable of producing larger quantities of better and more varied material, preserve soil conditions better, are less liable to damage from winds, fires and insects, and can more readily be reproduced."

Any person who has noticed a sapling of the white pine, growing in a pasture by itself, cannot fail to see how many branches it usually has in the middle or lower portion of its trunk, and how much it differs from the same kind of tree when it stands in the thick woods. The reason of this is that as the lower limbs have abundance of air and light, their growth is much more vigorous than if the light and air were partially excluded from the lower part of the tree, when that vigorous growth which is wasted on the branches would be spent on the development of the crown and trunk. He finds that our sapling pines in New Brunswick grow best on sandy soil, more especially when they are found associated with the white birch, which, when the pines become tall and overshadow them, die out and leave the field to their long-lived associates.

Mr. Fernow points out the manner in which the farmer should treat the wood lot, and concludes by giving directions as to how the wood crop should be cultivated. On the whole this little work of 60 pages is probably the best on practical forestry which has yet made its appearance in America.

Fredericton, N. B.

EDWARD JACK.

The lumber cut at Duluth for 1895 will aggregate nearly 500,000,000 feet. The mills will run till ice compels them to stop.

The Jackson saw mill at Tonawanda, which was burned on Oct. 27th, is the last of the log mills at that point. It had not been run for a year on account of the falling off in demand for the long bill stuff that it used to cut.

THE LEVER SAFETY-VALVE.

THE following interesting article on the safety valve is reproduced from a late issue of The Locomotive.

GENERAL REMARKS. We have received so many requests for a rule for calculating the position of the weight on a safety-valve, and the blowing-off pressure when the position of the weight is given, that we have thought it wise to publish such a rule in The Locomotive. It would be easy to give a simple formula for the purpose, but we have considered that the wants of engineers would be best met by explaining the theory of the lever-valve, and showing, as clearly as possible, the reason for each step in the calculation.

OBJECT OF THE SAFETY-VALVE.—The object of the safety-valve, as every one knows, is to prevent the pressure in the boiler from rising to a dangerous point,

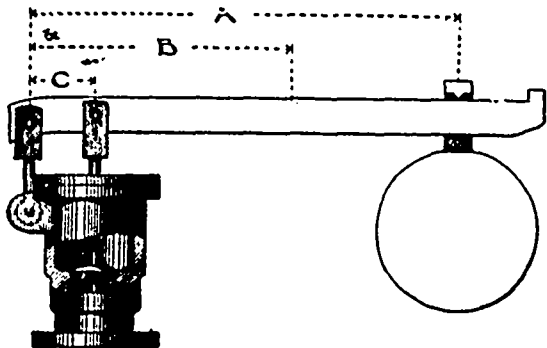


FIG. 1.—DIAGRAM OF A LEVER SAFETY-VALVE.

by providing an outlet through which steam can escape when the pressure reaches a certain limit, which is determined by the strength of the boiler, and by the conditions under which it is to work. The simplest device for attaining this end is the "dead-weight" valve, the principle of which is illustrated in Fig. 2. It consists simply of a plate of iron, laid upon a nozzle, and held down by a weight. The calculation of the blowing-off point of such a valve is very simple. In the valve here shown, for example, the steam acts against a circle two inches in diameter. The area of a two-inch circle is $2 \times 2 \times .7854 = 3.14$ sq in., and the weight tending to hold the cover plate down being 314 lbs., it is evident that the valve will not blow off until the steam pressure reaches 100 lbs. per square inch. Dead-weight valves are used somewhat in England, but they are seldom

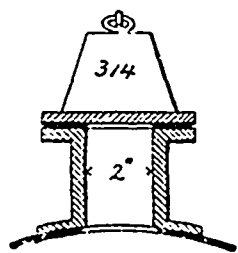


FIG. 2.—A "DEAD-WEIGHT" VALVE.

met with in this country, the commoner form here being that suggested in Fig. 1. It may be well to say that Fig. 1 does not purport to be a good form of valve. We should certainly object to it, if it were placed upon a boiler offered to us for insurance, because no guides are provided for the lever or for the valve stem. These features were intentionally omitted in the engraving, in order that their presence might not draw the attention away from the main points under consideration—the calculation, namely, of the blow-off pressure and of the position of the weight.

THEORY OF THE LEVER.—In order to be able to perform safety-valve calculations intelligently, one must have a clear idea of the principle of the lever; and it is hoped that such an idea may be had from a study of the illustrations that are presented herewith. These represent a lath or other light piece of wood which is balanced upon a knife edge, and into which, on the under side, a number of small staples are driven at equal distances. A number of

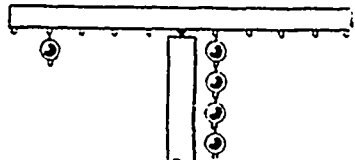


FIG. 4.

balls of lead are also supposed to be provided, all exactly alike, and all being furnished with a hook at the top and a staple at the bottom. Two of these weights, when hung upon the first staple, as shown in Fig. 3, will just balance one weight hung upon the second staple, on the other side of the fulcrum. In the same way, four of them, when hung upon the first staple, as shown in Fig. 4, will just balance one hung upon the fourth staple. Five upon the second staple, as shown in Fig. 5, will just balance two upon the fifth staple; and three upon the fifth staple will just balance five upon the third staple, as shown in Fig. 6. It will be seen that in every one of these cases the lath is balanced, provided the weight upon one side, when multiplied by its distance from the fulcrum, is equal to the weight upon the other side, multiplied by its distance from the fulcrum. This is the principle of Archimedes, and it is used in all calculations relating to the lever. (The reader may find it a profitable exercise to show that the systems shown in Figs. 7 and 8 are balanced. A suggestion is afforded him in Fig. 7, while in Fig. 8 he is left entirely to his own resources. He should find no difficulty in either case, however, if he has grasped the fundamental idea which is contained in the illustrations given above).

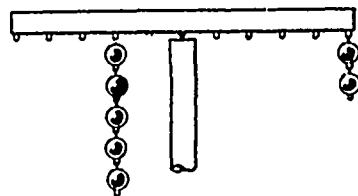


FIG. 5.

APPLICATION TO THE SAFETY-VALVE.—We are now prepared to apply the principle of the lever to the safety-valve, although there is still one point to be cleared up before we can give a complete rule. (The point to which we refer is the influence of the weight of the arm which carries the ball; but for the present moment we shall consider this arm to be devoid of weight, and we shall introduce a correction for it later on.) Fig. 9 is a crude representation of a safety-valve, in which the total steam pressure against the disk of the valve is supposed to be 40 lbs., and the ball is supposed to weigh 10 pounds. If the valve stem is 6" from the fulcrum, the ball will have to be 24" from the fulcrum in order for the valve to blow off at the given pressure—that is, at 40 lbs. This is easily seen, since 6×40 equals 10×24 ; but if the reader has any doubt about the applicability of Archimedes' rule in this case, he may note that the upward pressure due to the steam can be conceived to be replaced by a 40 lb. weight hung 6" to the left of the fulcrum, as indicated by the circled circle. The lever will then be equivalent to the one shown in Fig. 10, which is similar in all respects to those shown in Figs. 3 to 8, and to

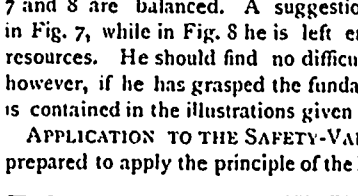


FIG. 6.

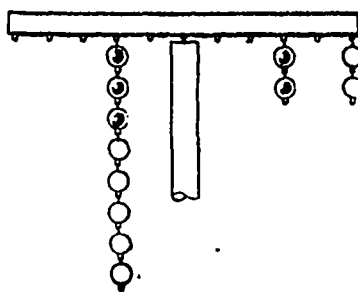


FIG. 7.

which Archimedes' rule plainly applies. If the blowing off pressure were not given in Fig. 9, and we were required to find it from the other data there shown, we should reason as follows: When the valve is on the point of blowing off, the upward thrust of the valve-stem is just balanced by the downward tendency of the ball; and, therefore, from Archimedes' principle, 10×24 must equal 6 times the thrust of the valve-stem. But 10×24 equals 240, and hence 240 is 6 times the thrust of the valve-stem, and $240 \div 6 (= 40$ lbs.) must be the total pressure exerted on the disk of the valve when it is about to blow off. If the pressure per square inch were desired, we should have to divide 40, the total pressure on the valve disk, by the area of the disk in square inches.

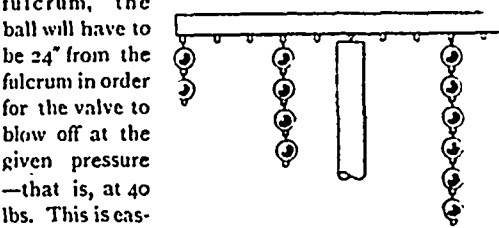


FIG. 8.

THE ARM OF THE VALVE.—In order to take the weight of the valve-arm into account, we shall first make a short digression for illustrating the meaning of the expression "center of gravity." Consider, first, the system shown in Fig. 11, where there is one ball on the first staple and one on the fifth.

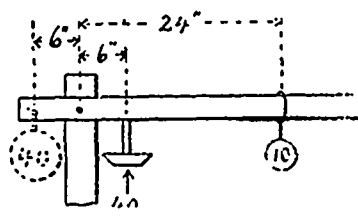


FIG. 9.

The one ball on the fifth staple is equivalent to five balls on the first one; so that the two balls on the right hand side of the fulcrum are equivalent to six balls suspended from the first staple. They are therefore balanced by the two balls on the third staple; and, in general, if two balls be hung from any of the staples, they would be exactly balanced by a pair of balls whose distance from the fulcrum was the average of the distances from the first two.

FIG. 10. FIG. 11. FIG. 12. FIG. 13. FIG. 14. FIG. 15.

FIG. 11. FIG. 12. FIG. 13. FIG. 14. FIG. 15.

FIG. 11. FIG. 12. FIG. 13. FIG. 14. FIG. 15.

FIG. 11. FIG. 12. FIG. 13. FIG. 14. FIG. 15.

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FIG. 11. FIG. 12. FIG. 13. FIG. 14. FIG. 15.

FIG. 11. FIG. 12. FIG. 13. FIG. 14. FIG. 15.

FIG. 11. FIG. 12. FIG. 13. FIG. 14. FIG. 15.

the fulcrum equal to half the length of the arm itself. This amounts to saying that a uniform valve-arm acts the same as it would if its weight were all concentrated at the middle point of the arm. The point in a body which possesses this property is called the center of gravity of the body. As we have said, the center of gravity of a straight lever may, in practice, be considered to be half way out towards the end of the lever; but if the lever has an appreciable taper, the center of gravity will be nearer the fulcrum. The position of the center of gravity can be found, in such cases, by calculation; but it is simpler to take the lever out, and balance it across a three-cornered file, as shown in Figs. 16 and 17. It will balance when the center of gravity is just over the edge of the file, and the distance *B* can then be measured directly.

CALCULATION OF THE BLOWING OFF PRESSURE.—We are now prepared to give a complete example of the

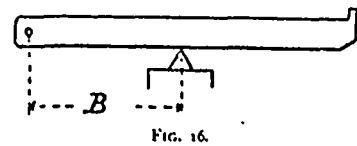


Fig. 16.

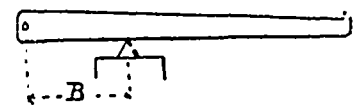


Fig. 17.

blowing-point of a safety-valve. Let us take the valve shown in Fig. 18. The arm is 32 in. long and weighs 3 pounds; the ball weighs 20 pounds and is set 28 inches from the fulcrum; the valve-stem is 4" from the fulcrum; the valve-disk is 2" in diameter, and the disk and stem, together, weigh 1½ pounds. It is required to find the blowing-off pressure. In the first case, let us consider the ball. It is possible to load the valve-disk directly (just as in the case of Fig. 2) with a weight which shall have precisely the same effect, in preventing the escape of steam, that the actual 20-pound ball has; and our first undertaking will be to find out how big this imaginary "dead weight" would have to be. When we say that it is to be "equivalent" to the 20-pound ball on the lever, we mean that it would just balance that ball, if it were on the left side of the fulcrum, instead of on the right; and hence, by Archimedes' principle, 28" x 20 lbs. must equal 4" multiplied by the imaginary "dead weight." Now 28 x 20 = 560, and 560 ÷ 4 = 140. In other words, the 20-pound weight, at a distance of 28" from the fulcrum, has just the same effect as a 140-pound weight would have, if placed directly upon the valve-disk. In the same way we may investigate the effect of the valve-arm. It weighs 3 pounds, and its center of gravity is 16" from the fulcrum. A three-pound weight, 16 inches from the fulcrum, is the same thing as a 12-pound weight, 4 inches from the fulcrum; because 3 x 16 = 48, and 12 x 4 = 48. Hence the valve-arm is equivalent to a 12-pound weight placed directly upon the valve-disk. The whole lever valve may therefore be regarded as equivalent to a "dead weight" valve loaded with 153½ pounds; for the ball is equivalent to a dead load of 140 pounds, the arm is equivalent to a dead load of 12 pounds, and the valve-disk and stem, taken together, weigh 1½ pounds; and 140 + 12 + 1½ = 153½. We have therefore found out that the valve will begin to blow when the total pressure of the steam against the valve-disk is 153.5 pounds. The part of the disk which is exposed to the stem is 2" in diameter, and its area is therefore 2 x 2 x

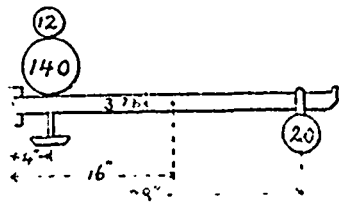


Fig. 18.—FINDING THE BLOWING PRESSURE.

7854 = 3.1416 square inches. The total steam pressure against this area being 153.5 pounds, the pressure against each square inch of it will be 153.5 ÷ 3.1416 = 48.9 pounds

(nearly). A valve with the dimensions given above will therefore blow off at just a trifle less than 49 pounds per square inch; and the calculation is similar in all cases.

SETTING THE WEIGHT. The method of setting the weight, when the blowing-off pressure is given, is almost precisely the reverse of the calculation given above. As an example, consider the valve shown in Fig. 19. The dimensions are as follows: Diameter of the valve = 4", length of the lever = 66", weight of the ball = 50 lbs., weight of the lever = 18 lbs., weight of the valve-disk and stem = 7 lbs., distance of valve stem from fulcrum = 3". It is required to set the ball so that the valve shall blow at 100 lbs. per square inch. The calculation is as follows: The area of a 4 inch disk is 4 x 4 x .7854 = 12.56 sq. in., and if the steam pressure is 100 lbs. per square inch, the total upward pressure against the valve-disk is 12.56 x 100 = 1,256 pounds. If the valve were of the "dead weight" kind, a load of 1,256 lbs. on the valve-disk would therefore cause it to blow at 100 lbs. per square inch. We therefore have to set the ball at such a place that the action of the ball, the lever, and the direct weight of the valve-disk and stem, shall be equal to a direct load of 1,256 lbs. Now, the lever weighs 18 lbs., and its "center of gravity" is (say) 33" from the fulcrum. It is therefore equivalent to a 198-pound weight laid directly on the valve-disk; for by Archimedes' rule we must have

$$33 \times 18 \text{ lbs.} = 3" \times \text{equivalent dead load.}$$

Now 33 x 18 = 594, and 594 ÷ 3 = 198 lbs., as stated above. In Fig. 19 this dead load (which is equivalent to the weight of the lever itself) is represented by the small weight marked "198"; and the large dotted ball above it (whose weight we are about to find) represents the dead load that is equivalent to the 50 lb. ball on the lever. The dotted weight, together with the 198 lb. weight, and the weight (7 lbs.) of the disk and stem, must be equal to 1,256 lbs., as we have seen. That is, the dotted weight must be 1,051 lbs.; because

$$1,051 + 198 + 7 = 1,256$$

The problem has now resolved itself into placing the 50 lb. ball at such a point that it shall be equivalent to a dead load of 1,051 pounds. The valve stem being 3" from the fulcrum, Archimedes' gives us

$$1,051 \text{ lbs.} \times 3" = 50 \text{ lb.} \times \text{distance of ball from fulcrum.}$$

Now 1,051 x 3 = 3,153, and 3,153 ÷ 50 = 63.06 inches. That is the ball must be placed 63 inches from the fulcrum, in order that the valve may blow at 100 lbs. per square inch.

RULES.—The processes of calculation which are explained above may now be summarized in the following two rules*:

RULE I. To find the blowing pressure when the position of the ball is given. Multiply the weight of the ball by its distance (*A*) from the fulcrum, and divide by the distance (*C*) of the valve stem from the fulcrum. (This gives the dead weight that is equivalent to the ball.) Then multiply the weight of the lever by the distance (*B*) of its center of gravity from the fulcrum, and divide by the distance (*C*) of the valve stem from the fulcrum. (This gives the dead weight that is equivalent to the lever.) Add together the two "dead weights," so calculated, and add in, also, the weight of the valve-disk and stem. (This gives the total weight that is keeping the valve-disk down.) Then divide the sum thus found by the area of the valve disk, in square inches, and the quotient is the pressure, in pounds per square inch, at which the valve will blow.

RULE II.—To set the ball, so that the valve shall blow at a given pressure. Multiply the area of the valve-disk by the blowing off pressure, expressed in pounds per square inch. (This gives the total effort of the steam to force the valve-disk up.) Subtract, from this total pressure the weight of the valve and stem. The remainder is the "dead weight" to which the lever, and ball, taken together, must be equivalent. Then multiply the weight of the lever by the distance (*B*) of its "center of gravity" from the fulcrum and divide by the distance (*C*) of the valve stem from the fulcrum. The result is the "dead weight" to which the lever is equivalent; and if this be subtracted from the total dead weight, just mentioned, the remainder will be the "dead weight" to which the ball alone must be equivalent. Multiply this remainder by the distance (*C*) of the valve

*The letters refer to Fig. 1.

stem from the fulcrum, and divide the product by the weight of the ball. The quotient is the distance, *A*, that the ball must be placed from the fulcrum, in order that the valve may blow off at the desired pressure.

CAUTIONS.—In applying these rules two things must be carefully observed. In the first place, the diameter of the valve-disk must be measured at *a b*, in Fig. 20, and not at *c d*; for the steam acts only on the circle whose diameter is *a b*. Again, if the valve stem has a square top, as indicated in Figs. 21 and 22, *m n* must be taken as the "distance of the valve stem from the fulcrum"; because the moment the valve raises in the least degree, the pressure of the stem is all applied to the lever at *n*, as is plainly indicated in Fig. 22.

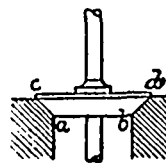


Fig. 20.

Although the foregoing article is interred simply to explain the principle underlying the lever safety-valve, it may be well to touch upon one point concerning the construction of such valves. The point we have in mind is this: When the boiler is under steam, it is an easy matter to try the valve, and find out whether it works freely or not. It ought also to be easy to do this, when the boiler is out of use; and in many cases it is so. Usually when the boiler is not under steam, it is sufficient to raise the weight and the lever, and then to try the valve stem with the thumb and finger; but some valves are so constructed that the valve-disk is free from the stem, and in such cases that the fact that the stem is free proves nothing whatever, so far as the disk itself is concerned, and the disk must be separately investigated before the valve can be pronounced in good condition. If there is no escap. pipe



Fig. 21.

screwed into the valve, the disk can usually be reached from the exhaust side, and its condition noted; but if such a pipe is provided (as it is, in many cases) the inspector has to examine the disk as well as he can, from the inside of the boiler. If the valve does not happen to be secured directly to the nozzle, an examination from the interior of the boiler is not practicable, and then the waste pipe has to be unscrewed, or the bonnet of the valve taken off, before the disk can be reached.

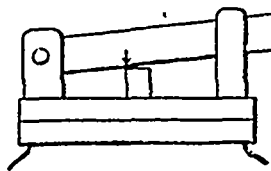


Fig. 22.

These difficulties, when combined with the fact that there is often no external evidence to show whether the valve is secured to the stem or not, lead us to recommend strongly that valves with separate disks be avoided altogether. They have no very marked advantage over those in which disk and spindle are all in one piece, and as they are likely to deceive one into the belief that all is in good condition, when in reality the disk may be stuck fast, we feel justified in condemning their use altogether.

SPONTANEOUS FIRES.

LAMPBLACK has been known to take fire spontaneously:

Oiled or greasy rags have been seen to blaze up in a few minutes after having been thrown on the floor.

Dried rubbish exposed to the heat of the sun's rays has been seen to catch fire under circumstances that rendered any other cause impossible.

The sun's rays focused through a window pane on a plank in the floor containing pine sap have been known to set it on fire.

Sawdust used for cleaning floors, or absorbing spilled oil and varnish, should be removed from the buildings.

Sawdust accumulations around journals of machinery are prolific sources of fires.

Matches in the pockets of cast-off clothing are dangerous.

Varnish and turpentine cans placed too near the stove in cold weather are liable to explode and catch fire.

OTTAWA LETTER.

[Regular correspondence CANADA LUMBERMAN.]

THE water in the Ottawa is still very low, and vessels are constantly getting aground on banks of saw-dust. More islands (sawdust) appear in the river than are laid down in the geographies. Some difficulty is experienced in getting into the Rideau canal locks.

The cut at the Chaudiere mills this season will fall short of that of 1894 by some fifty million feet. It must not be inferred that the lumber business in this city is declining. The shortage is due to other causes which may not occur again.

The municipal census shows the population of Ottawa to be 49,674, and places it fourth in size among the cities of Canada. Ottawa owes this largely to the lumber trade.

For the five months, May to September, both inclusive, the number of rafts reported at Ottawa through the Rideau canal was as follows, for the months named:—1895, 1; 1894, 0; 1893, 7. The Rideau does not appear to be much of a route for rafts.

The project of a canal to the Georgian Bay by way of the Ottawa River is not a new one, but it has taken on new life and is being boomed for all it is worth. Mr. Macleod Stewart is the most active promoter. If carried out it will have an important influence on the lumber trade.

After six years of litigation Antoine Ratte, proprietor of a boat livery in this city, has recovered damages from the Chaudiere mill owners for dumping sawdust into the river. The millmen were made joint defendants and the damages were divided as follows:—J. R. Booth, \$1,827.77; Perley & Pattee, \$879.14; Bronson & Weston, \$879.14. The costs in the case are very large. Mr. Ratte entered a similar suit twelve years ago, which went to the privy council, and now he is in a position to enter another action for damage done since the suit just decided was entered upon.

A statement having been put forth that Mr. J. R. Booth, the great lumberman, who is building the Ottawa, Arnprior and Parry Sound Railway, had brought outsiders here to work for 90 cents a day, that gentleman has referred doubters to his pay rolls, which show that \$1.25 a day was the lowest paid during the summer. During the winter some men did get from 90c. to \$1.10 a day of 8 or 9 hours, doing work which was not really required till the spring. To men in the woods Mr. Booth pays \$17 to \$24 per month, according to the nature of their employment.

Canadian firms have sent between 6000 and 7000 men into the woods this year, and United States firms operating in Canada about 2000 more. Wages average as follows:—Foremen \$50, cooks \$35, log cutters \$22, teamsters \$20, general hands \$18, road cutters \$16, all with board. The prospects for a good season are bright.

OTTAWA, Can., Nov. 22, 1895.

BRITISH COLUMBIA LETTER.

[Regular correspondence CANADA LUMBERMAN.]

THE Everett mill men talk of shipping a cargo of shingles and siding by way of Cape Horn next spring.

An effort is being made to form a lumber association for the entire Pacific coast. The San Francisco men are working it up.

Reports from Melbourne, Australia, are to the effect that stocks of fir timber are exceedingly low, and that prices are stiffening. When the reduced tariff goes into effect on 1st January we expect a great impetus to our trade. The reduction being on sizes 12 x 12 and over, it will promote the shipment of large sizes at the expense of the smaller, but is nevertheless satisfactory to our millmen.

It is reported that the Ross-McLaren Lumber Co. are seriously considering the erection of a large cargo mill near Cape Caution; also that a Tacoma firm have a party looking up a site on the mainland, near the north end of Vancouver Island, for a similar venture.

Mr. Francis Rotch, manager of the Seatco Manufacturing Co., Bucoda, went to Central America on the Transit, the first steamer of the Puget Sound Central American line, to represent his mill and Tacoma merchants. Soon after his arrival he cabled an order from San Jose de Guatemala for 300,000 feet of fir lumber. So do new markets open up for Pacific coast timber.

A Norwegian ship, the Mathilda, of 2269 tons register, recently arrived at Vancouver, from Nagasaki, Japan, to load lumber and canned salmon for Buenos Ayres. She will likely be followed by others. This is a new departure in our west coast trade.

Shingles are an interesting topic here, but there is very little to report, trade for this year being practically over. So far as I know now, the amount of shingles produced this year will be about the same as last; and although not at present in a position to give the exact amount of the cut, I think about 125,000,

000 is an outside figure. As to prices I can speak with more certainty, as I know that shingles have not been netting the manufacturers within 10 to 15 cents per thousand as much as they did last year. The reason of this is that we have had to compete with our neighbors in Washington. For example: We would have had no trouble in getting \$2.50 per 1000 for our extra 6 to 2's delivered in Ontario, but Washington parties issued price lists at \$2.35, and as a result we had to drop to \$2.35 and \$2.40. Possibly 25 per cent. of the cut of British Columbia has been sold in the United States this year at prices never below what Puget Sound manufacturers and dealers sold at, and in a good many instances 5 to 10 cents per 1000 more.

NEW WESTMINSTER, B.C., Nov. 18, 1895.

NEW BRUNSWICK LETTER.

[Regular correspondence CANADA LUMBERMAN.]

ABOUT 80 schooners took cargoes of lumber at Fredericton for the United States this summer. Fully three times as much was sent in October as during the same month last year.

Men are being hired for the woods at wages ranging from \$14 to \$20 per month.

A number of men hired in this province for lumbering in Maine have been turned back at the frontier on account of the Alien Labor law. This seems to be a small business.

The cut of logs on the upper St. John this winter will be considerably larger than that of last year. The cut on the St. John above the Grand Falls will total about eighty millions. About twenty-five millions will be got out on the Tobique, which is larger than last year's cut. The cut on the Aroostook will fall short. The operators are Allan Hammond, who will get out about three million on Black Brook and Half Way Brook for Cushing & Co.; Robt. Aiken, who will cut about two million for Miller & Woodman at the head of the Madawaska, and Cornelius Hagerman, who has contracted to get out a million on the St. Croix for W. H. Murray.

Adams & Co., of New York, have bought all the New Brunswick property of the St. Lawrence Lumber Company—the Bathurst mill and property from the English bondholders, and the stores, tug-boats and other plant from the liquidators. The Burnsville mill and property they bought from the Merchants' Bank of Halifax. Men have been sent into the woods on both properties, and six to eight million logs will be cut this winter. Adams & Co. will construct the extension of the Caraquet Railway to Lacadie, for which subsidies have been granted.

ST. JOHN, N. B., Nov. 23, 1895.

MICHIGAN LETTER.

[Regular correspondence CANADA LUMBERMAN.]

NORWAY pine and hemlock are very much depressed in price at present. The former is selling at \$8 to \$8.50, the latter at \$7 to \$8. There is no money in them at such prices.

Nearly as much lumber has been shipped from Alpena this season as from the Saginaw river, that is by water. This is quite a change.

The Mosher failure is still a fruitful source of discussion in the Saginaw Valley. The liabilities, according to the latest statement, are not far from \$1,000,000.

Four large steel pontoons, 30 feet long and 12 feet in diameter, have been built at Bay City, to be used for raising the steamer Cayuga from the bottom of Lake Michigan, where she lies in 101 feet of water.

The lumber shipments by water for October were only 17,840,000 feet, a very small showing for one of the closing months of the year. Up to date the shipments are 54,000,000 feet less than 1894, and 200,000,000 feet less than 1892. There is more lumber in proportion on the docks than usual. As for shingles, only 8,165,000 have been moved by water this season. Over 200,000,000 are handled here annually, an increasing number being transported by rail. In 1893 the Michigan Central and Flint & Pere Marquette each carried about 2340 car loads.

There has been a considerable falling off in the business of the Saginaw Valley, due partly to recent failures, partly to other causes. There will be large stocks held over. This will have an effect in curtailing the cut of logs, both here and in Canadian woods. There have been only about two-thirds the usual quantity of logs brought across the lake this season, and next year there will be less still.

J. T. Hurst and the Holland-Emery Co. cut 100,000,000 feet last year. This year they will not cut more than 20,000,000. They have, however, 30,000,000 feet hung up, so that they will have 50,000,000 feet for next season.

The Fair Haven Stave Co. have done a good business this season. They say fruit barrel staves are in large demand for

eastern markets, and that they will carry over nothing but a few No. 2 staves. Such a season was not expected and the mills did not stock up for it, so they are all pretty well cleaned out. The outlook for next season is uncertain. Timber is becoming scarce and dear, and prices are too low for staves and heading to enable a profitable business to be done. The Carey Hoop Co., of Harbor Springs, which makes coiled hoops, report trade in that branch fairly good.

The factory of the Improved Match Co., at Detroit, a branch of the Match Trust, was destroyed by fire Nov. 16th. Three persons were burned to death. The factory was working day and night. The loss is about \$45,000. The fire was started by an employee stepping on a match, and it spread with alarming rapidity. There is a lesson here to be careful with matches.

Colonel A. T. Bliss, of this state, owns a tract of 130,000,000 feet of fine white oak timber in Arkansas, about eighty miles from Hot Springs, and in view of the steady demand for quarter-sawed oak, is considering the project of organizing a company to erect a milling plant on the tract and manufacturing the timber.

The old passenger steamer Fountain City, which, in the sixties, was the largest passenger steamer on Lake Michigan, has been changed into a steam barge for the lumber trade, with a carrying capacity of 700,000 feet.

The Michigan Salt Co. has advanced the price of salt 5c. a bbl., which makes it 55 cents for fine.

Shaw & Tyman will run their saw mill at Sault Ste. Marie all winter.

The demand for men for the woods in the eastern end of the upper peninsula is greater than the supply. Several firms have agents at St. Ignace hiring men as they cross the straits, but when hired and their fare paid they have to be closely watched to prevent other agents from stealing them away at stations along the line.

Pack, Woods & Co., of Oscoda, have been re-estimating their pine, and find they have enough on the Au Sable waters to keep their mill going 5 years. They also have considerable on the Georgian Bay, and think they can saw it as advantageously at the mouth of the Au Sable as anywhere.

The Northern Michigan Hardwood Lumber Association held an important meeting at Traverse City recently to consider the depressed state of the market. They propose to curtail the output some 50 or 60 per cent. They say they do not desire to create a corner in hardwood, but simply to prevent it being slaughtered at rates which are unprofitable. The matter will be further considered at their December meeting.

The Henry Howard Estate, Port Huron, has not been three days without a special order on the head sawyer's slate this summer.

SAGINAW, Mich., Nov. 23, 1895.

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MANUFACTURER
OF
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TOOLS

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CANT HOOK
GAFF
SOCKET
SKIDDING TONGS
CANT HOOK CLASP
CANT HOOK CLASP
GAFF

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THE NEWS.

The N. & B. mills, Marysville, Mich., have closed down on account of low water.

The sawing season at Minneapolis has closed. The cut is about the same as last year.

A sea wall is to be built on the lake front in Chicago, which will require about 3,000,000 ft. of yellow pine.

Mr. Christopher O'Kelly, a well known lumberman, of Peabroke, Ont., died a few days ago. He was almost an octogenarian.

The Chatham Manufacturing Co. have closed down for the season and are taking stock. They will reopen on the first of January.

A combination has been formed among the clothes pin manufacturers of the United States. The output exceeds 500,000,000 annually.

The Rathbun Co.'s match factory at Deseronto now employs about seventy hands. Eight machines are in use and two more will be put in shortly.

—The Minister of Public Works is being urged to improve the navigation of the St. Maurice, on which considerable lumbering is done, and where the Messrs. Drummond take out a large quantity of wood to be made into charcoal for their Radnor forges.

—Mr. Cameron, manager of the Western Lumber Co., Winnipeg, says of the course of trade: The season for business is gradually changing in the west. Formerly we did considerable trade in the fall, but now it is mostly transacted between April 1 and September 1.

A spar 128 feet in length, 28 inches in circumference at one end and 26 inches at the other, is being shipped to England by the Hastings mill, Vancouver. It is for a racing yacht, and is of the finest quality, not having a knot or blemish of any kind in its entire length.

—Farnworth & Jardines wood circular, Liverpool, 1st November, gives the arrivals from British North America for the month of October as 28 vessels, 26,807 tons, against 42 vessels, 36,417 tons, for the same month last year. The total arrivals to date are slightly in excess of 1893 but considerably behind those of 1894.

PERSONAL.

Mr. A. H. Campbell, of Toronto, the well known lumberman, will spend the coming winter with his family in Europe.

Mr. H. A. Wiley, a member of the firm of Thos. Marks & Co., Port Arthur, was in Toronto recently, hiring men to cut spruce on the firm's limits on Lake Superior. A considerable amount of their output goes to Indiana, where it is made into paper.

Mr. A. A. Benson, representing the Waterous Co., of Brantford, having completed the Hamilton mill at Strait Shore, N. B., has gone to Ellerhouse Station, N. S., to look after the erection of a mill for Mr. T. G. McMullen, of Truro. He has made lots of friends while in the lower provinces.

A representative of the CANADA LUMBERMAN has had the pleasure of meeting in Montreal Mr. Paul Duluard, lumber merchant, of Paris, France. Mr. Duluard does an extensive trade in lumber, and especially in pulp wood, in France, and has come to Montreal for the purpose of making arrangements with a couple of houses to act as his agents. He has hitherto been doing business with Norwegian and other foreign exporters, but the coming into force of the Franco-Canadian treaty has led him to seek better conditions here. After arranging his business in Montreal Mr. Duluard will leave for New York, whence he will sail for France.

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REASONS,

AND HOW TO

AVOID THEM



Being instructions to filers on the care of large band saw blades used in the manufacture of lumber.

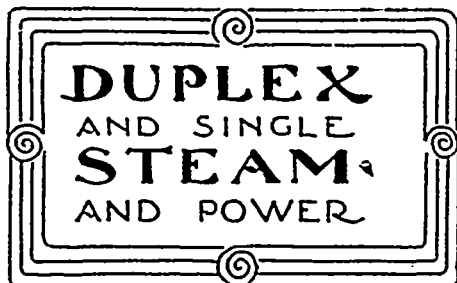
A book filled with valuable information on the care of band saws. Giving the reasons for breaking: analyzing each reason; giving instructions to dispense with the causes as laid down in each reason; and full details on filing and brazing. The proper styles of hammers to use are illustrated and described, and views of blades showing the blows of the different styles of hammers form an important part of the illustrations. Improper and unequal tension are then treated, and the manner of properly setting irregular teeth is described. In connection with the treatise is a history of the invention, manufacture and use of the saw from its origin to the present time. The work in whole makes an accumulation of information such as has never before been published.

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PAPER PULP BOARDS.

AMONG the recently granted Canadian patents, as described in the last issue of the Patent Record, is one for a process of making paper pulp boards, etc. The patentee is Wm. Norris Cornell, of Brownville, N. Y., and the claim is as follows:

An improved process of making paper pulp board in imitation of natural wood, which consists in winding convolutionally on a paper machine, a pulp board of less than the desired thickness, then in adding a separate piece or pieces of pulp to the partially finished pulp board and finally in finishing the winding of the pulp board to the desired thickness, whereby said separate piece or pieces of pulp cause the pulp board to slip and wrinkle on the forming roll, substantially as set forth. 2nd. An improved process of making pulp board in imitation of natural wood, which consists in winding convolutionally on a paper machine, a pulp board of less than the desired thickness, then in adding to the partially finished pulp board a separate piece or pieces of pulp of greater density or drier, and of another color than the pulp board, and finally in finishing the winding of the pulp board to the desired thickness, whereby the said separate piece or pieces of pulp cause the pulp board to slip and wrinkle on the forming roll, substantially as set forth. 3rd. An improved process of making pulp board in imitation of natural wood, which consists in winding convolutionally on a paper machine, a pulp board of less than desired thickness, then in adding to the partially finished pulp board a separate piece or pieces of pulp of greater density or drier, and of a darker color than the pulp board, then in finishing the winding of the pulp board to the desired thickness, whereby said separate piece or pieces of pulp cause the pulp board to

slip and wrinkle on the forming roll, then in removing the pulp board from the machine and finally in drying, sand papering, and finishing pulp board, substantially as set forth.

The water in the Rideau has not been so low for years. Mr. W. C. Edwards' mill at New Edinburgh has been working less than half time.

There is only one pulp mill on the North Pacific Coast, that at Everett, Wash., which uses 2,500 cords of wood per month and turns out 15 tons of paper per day.

The ships India and Hindostan, which have loaded lumber regularly for some years at the Moodyville mill, Vancouver, will hereafter load at the Hastings mill.

It is reported at Huntsville that Mr. Marshall, of Winton, Ont., has purchased the Fairy Lake Lock saw mill from the Canada Permanent Loan Society, and will fit it up for sawing hardwood.

ROBIN, SADLER & HAWORTH

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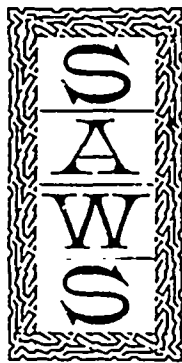
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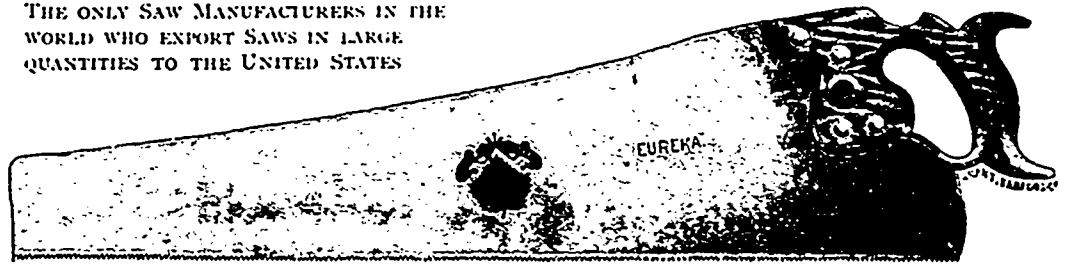
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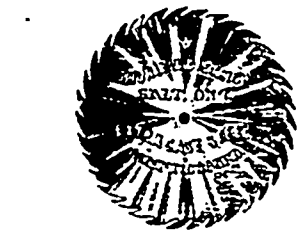
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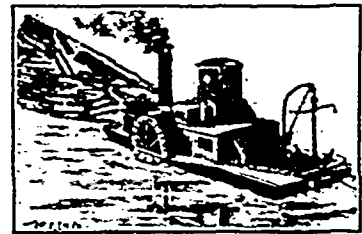
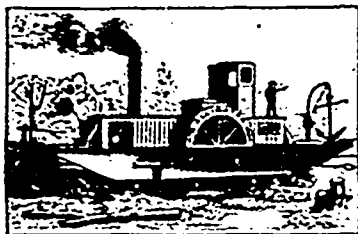
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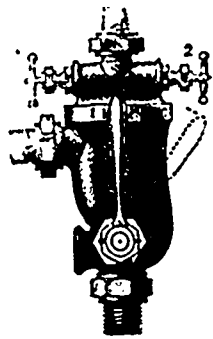
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15	10.10	1 1/2	1/2	300	20 to 40
17 1/2	12.00	1 1/2	1/2	400	30 to 50
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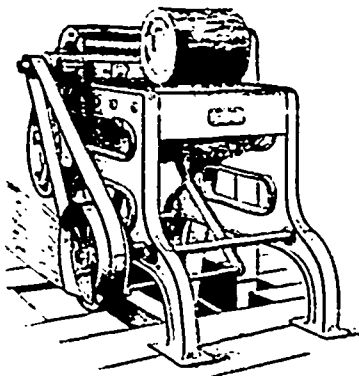
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- Moulder, 3 side, 10", Cowan & Co., endless bed.
- Lathe, Shafting, 30' long, swings 24" over shears, modern tool.
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- Lathe, 18" x 8" London Tool Co. make.
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- Lathe, 24" swing x 12' bed.
- Lathe, 20" swing x 12' bed.
- Lathe, 20" swing x 10' bed.
- Lathe, 18" swing x 10' bed.
- Lathe, 18" swing x 8' bed.
- Lathe, 16" swing x 10' bed.
- Lathe, 16" swing x 8' bed.
- Lathe, 16" swing x 6' bed.
- Radial Drilling Machine, 66" arm.
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TRADE NOTE.

The Ottawa Saw Co., although only one year in business, are taking a leading position in Canada as saw manufacturers. They report that the last year's business has been successful beyond most sanguine expectations both as to quantity of work turned out, and the general satisfaction that it has given. Their works are fitted with the latest improved machinery, and the tempering plant is the outcome of many years study and experience; the workmen are all tried and carefully selected. The members of the firm are practical saw makers of long experience in shops and mills in both Canada and United States, and they claim that their gang circular and shingle saws cannot be equalled in Canada. The Ottawa Saw Works

Co. seeing the growing demand for a high grade band saw have added this industry to their works. During the past summer they supplied a number of these saws to different mills, and the results have been so good that they will now make this a special feature of their business. They further inform us that already they have booked a number of full outfits in saws for large mills for next seasons use. They also make a specialty of repairing.

J. W. Howry & Sons, of Fenelon Falls, Ont., are reported to have sold recently 50,000 feet of cork pine lumber to a Toronto firm at \$60 a thousand, to be used in the manufacture of pianos.

OBITUARY.

Alderman Hurteau, of Montreal, who was engaged in lumbering for many years, is dead. Consumption was the cause of death.

Mr. John A. Humphrey, ex-M. P. P. for Westmoreland, N. B., is dead. He managed his father's mills at Moncton from 1845 to 1849, when he purchased the mills, and has run them ever since. He left an estate of nearly a quarter of a million.

Turkey imports large quantities of lumber from the United States. The attention of Canadian lumbermen is called to this country as a new opening for their trade.

Can your Son keep your books?

Send him for a few months to the

BRITISH AMERICAN COLLEGE OF TORONTO, LTD.

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EDW. TROUT, **DAVID HOSKINS,**
President. *Secretary.*

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DODGE PATENT WOOD SPLIT PULLEYS

FOR MODERN SAW-MILLS

See What the Big Fellows say

BUELL, HURDMAN & Co., Lumber Manufacturers,
HULL, P. Q., CANADA, November 29, 1894.
THE DODGE WOOD SPLIT PULLEY CO., TORONTO, ONT.

GENTLEMEN.—We take great pleasure in stating that we have a number of your wood split belt pulleys in our mills, and that they GIVE US EVERY SATISFACTION, and we CAN RECOMMEND THEM HEARTILY. Also, if any of our neighbors in this section would like to see them in operation, we should be PLEASED TO SHOW THEM AT ANY TIME.

Yours very truly, BUELL, HURDMAN & Co.

SEND FOR CATALOGUE AND DISCOUNTS.

Dodge Wood Split Pulley Co.
68 King St. West, Toronto.

Dauntless Shingle and Heading Machine

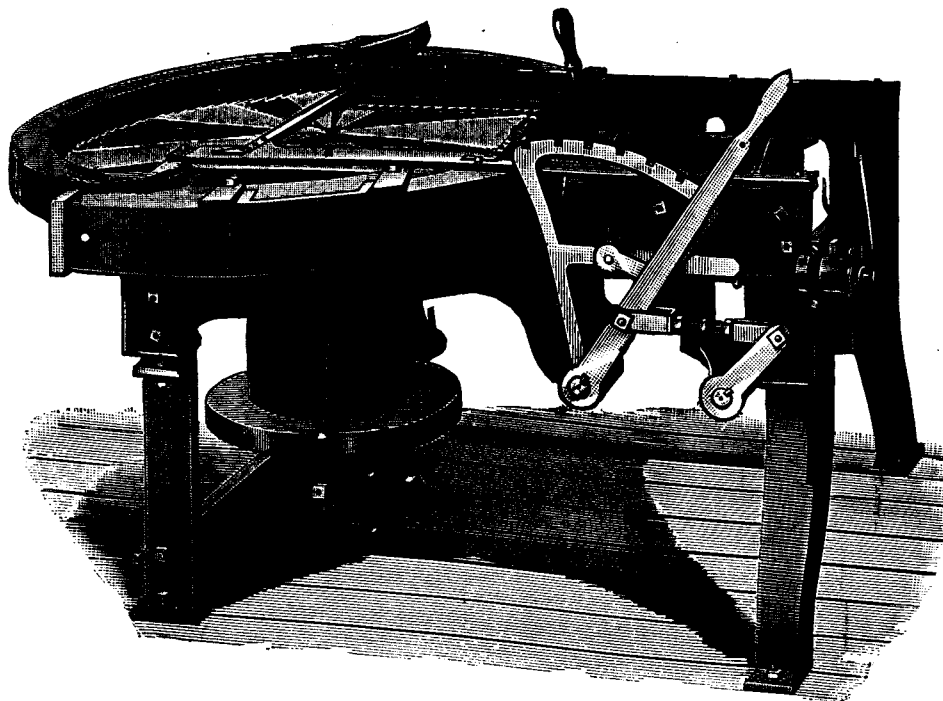
∴ WILL make more Shingles per day than any self-acting machine with vertical saw in existence, and more Shingles from the same quantity of timber.

THE FRAME

... Is of Iron throughout, very heavy and rigid, strongly bolted and braced.

THE CARRIAGE

... Is very light and strong, made of forged Cast Steel Plate, running on steel ways or tracks. Will take in a block 18 inches wide and 19 inches long, adjustable for 16-inch or 18-inch shingles.



—CAPACITY FROM 25,000 TO 50,000 PER DAY—

[COPY.]

HASTINGS, Dec. 3, 1894.

F. J. DRAKE, Esq., Belleville.

Dear Sir,—We have waited two years before giving you our idea of your machinery. This we did to thoroughly test it, and can now say we know what it can do.

Your Saw Mill is equal, or nearly equal, to any we have seen of much heavier make, and far in advance of any light rig in the market. The capacity per day is fully up to your guarantee, 40 M per day. We have tested with eight men.

The Shingle Mill cannot be beaten for any kind of timber. Ours being in a manner a custom mill, we have good, bad and indifferent timber, but for all it does the work satisfactorily.

You may use this in any way you please, or refer to us at any time.

Yours truly,

(Sgd.) W. J. & H. W. FOWLDS.

(F. J. DRAKE)

PATENTEE AND . . . MANUFACTURER OF SAW, SHINGLE AND LATH MACHINERY
Care Canadian Locomotive & Engine Co., KINGSTON, ONT.

Kemball Bros., of Bryanston, Ont., have recently erected a saw mill at that place.

Davis & Crothers, of Upper Gagetown, N. F., contemplate erecting a saw mill at that place.

The Northern Lumber Co., with a capital of \$20,000, has been incorporated. The promoters are: Alex. and Joseph de Lorimier, of Coughnawaga, S. A. and A. E. de Lorimier and E. H. Godin, of Montreal.

Messrs. Gemmill & May, Ottawa, solicitors, give notice of application at next session of the parliament of Canada, for an act to incorporate the Yukon and British Columbia Trading & Development Company of Canada, for the purpose of carrying on in Canada, the United States and elsewhere, the business of general merchants, lumberers, vessel owners and forwarders and miners.



Sole Canadian Agents :-: Prices Reduced.
WATEROUS, BRANTFORD, CANADA.

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INSPECTION
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Containing Rules for the Inspection and Measuring of Pine and Hardwood Lumber in the leading markets of Canada and the United States. Embracing also many useful tables and calculations of everyday service to lumbermen.

*Prepared by the Editor of the
"Canada Lumberman."*

~ ~ ~

Toronto, Canada
C. H. MORTIMER, Publisher
1895

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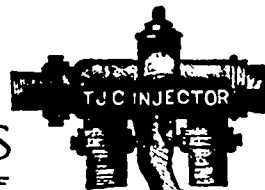
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Furnished with Steel or Cast Skelns, 3 1/4, 4, or 4 1/2 arms. Any width tire. Are well built of thoroughly seasoned timber, heavily ironed and well finished. Built of any capacity required. Are **STRONG, DURABLE, and LIGHT** running. A trial order will be most convincing. Satisfaction guaranteed. Write us for further information. Address all orders or inquiries to

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T. J. C. INJECTOR

the most economical boiler feeder in the world.

20 per cent.

saved in coal over any other make. Absolutely automatic. Easily attached. Applicable to all kinds of boilers.

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Will outwear any other make and is simple in construction. It is easy to operate, and is the most powerful feeder in the world.

The T. J. C. Injector

is the best because you cannot possibly go wrong with it. With high or low steam the result is equally satisfactory. It combines the utmost simplicity with perfect efficiency, and any boy can operate it.

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No.	Price.	Horse Power.
7	\$ 7 00	4 to 8
10	7 00	8 to 16
15	10 50	16 to 40
20	15 00	40 to 72
25	22 50	72 to 120
35	30 00	120 to 220
45	38 00	220 to 300



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FINE SITES FOR NEW MILLS
BEST OF FREIGHT FACILITIES
CLOSE PROXIMITY TO
COAL FIELDS AND DISTRIBUTING CENTERS
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INTELLIGENT HELP OF ALL KINDS
MANY KINDS OF RAW MATERIAL

For full information write to the undersigned for a copy of the pamphlet entitled

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This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R. which is the only road under the management running through from the North-Western States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I.C.R.R. Co., 506 Central Station Chicago.

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Is the Short Line to
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(Centres of the vast lumber interests of Michigan)
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BALDWIN, LUDINGTON, MANISTEE
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The last-named place reached by the Company's line of steamships across Lake Michigan.

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MONTREAL TORONTO
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To **ST. PAUL, DULUTH** and Pacific Coast Ports.

This road traverses a section of Michigan with unrivalled advantages to settlers. Cheap lands, thriving villages and towns, well watered with streams in all directions: a market for every product of Forest and Field.

The policy of the "F. & P. M." is known to all travellers and settlers.
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GENERAL OFFICES: **SAGINAW, MICH.**

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OF EVERY DESCRIPTION FOR
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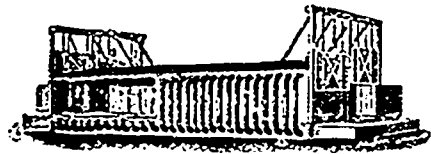
THE DOMINION LEATHER BOARD COMPANY

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MANUFACTURERS OF

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... AND ...
ROOFING, SHEATHING AND FLOORING FELTS

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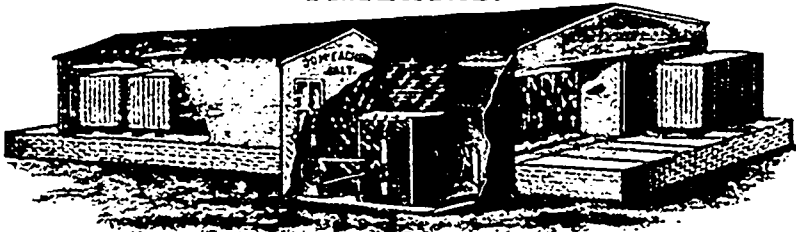
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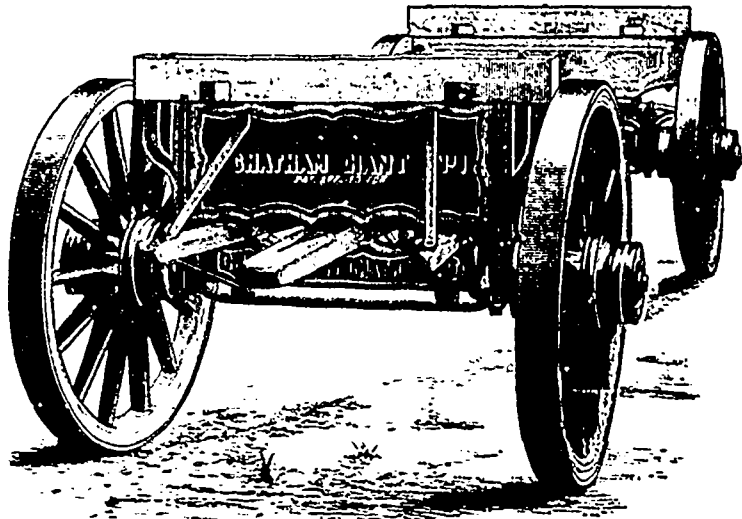


COST of erecting, running and maintaining the lowest and results the highest of any dry kiln and drying system in the market. Green Elm, Ash, Whitewood, &c., for furniture dried in six days; only exhaust steam 10 hours per day used.

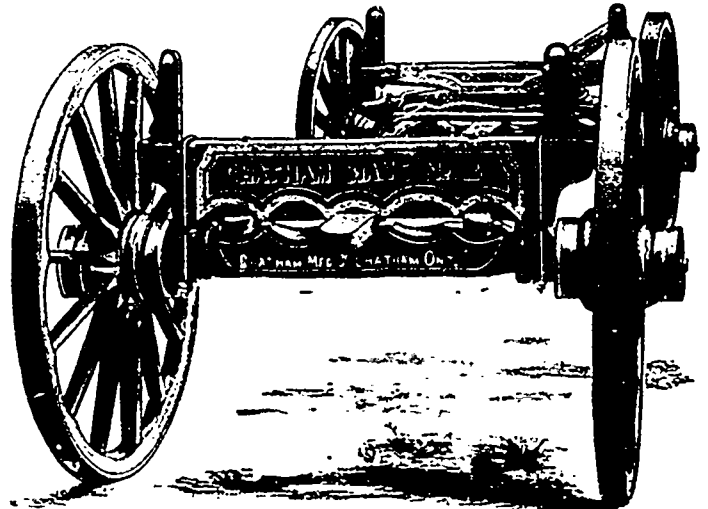
NO CHECKING, WARPING OR CASE-HARDENING.

THE MCEACHREN HEATING & VENTILATING CO. Galt, Ont.

THE CHATHAM GIANT LOG TRUCK



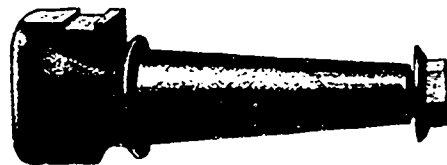
IT must be self-evident that our GIANT ARM LOG TRUCKS, of which the above is a faithful illustration, is the best log truck made; but if conclusive evidence of this is wanted we refer to every mill man and lumberman in the county of Essex, Ont., where millions upon millions of Elm logs are gotten out every year on them, and where these trucks sell readily, while those of other makes remain unsold at \$5 to \$10 less.



THE CHATHAM GIANT LOG AND LUMBER TRUCK

As seen above it is a Lumber Truck, but it is quickly converted into a Log Truck by bunks which are grooved at the ends to receive the stakes and slip down between them, and are perforated for side or lug poles. We build these trucks in all sizes from 2 1/2 to 4 inch Malleable Giant Arms. Farmers all over are extensively adopting the lighter sizes as general purpose wagons.

In reference to above trucks we would call the attention of the reader to the accompanying illustration of VAN ALLEN'S PATENT GIANT ARM with which they are equipped.



It will be seen that the hind bolster and sand-board are formed to rest upon the flat top of this arm and being securely clipped to the axles forms a complete and solid truss and render the axles unbreakable and inflexible.

Our Malleable Giant Arm farm and teaming Wagons have no equals on this continent, of which the judges on vehicles at the World's Fair, Chicago, gave us an unqualified certificate in the shape of a GOLD MEDAL AND DIPLOMA.

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