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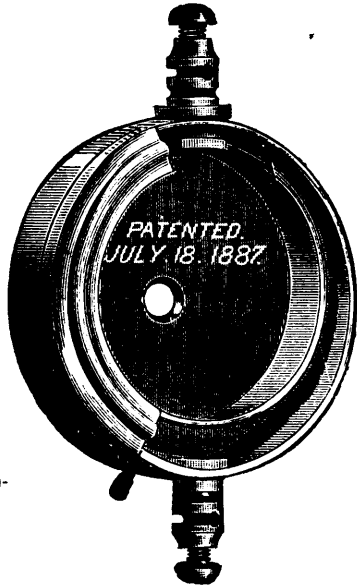
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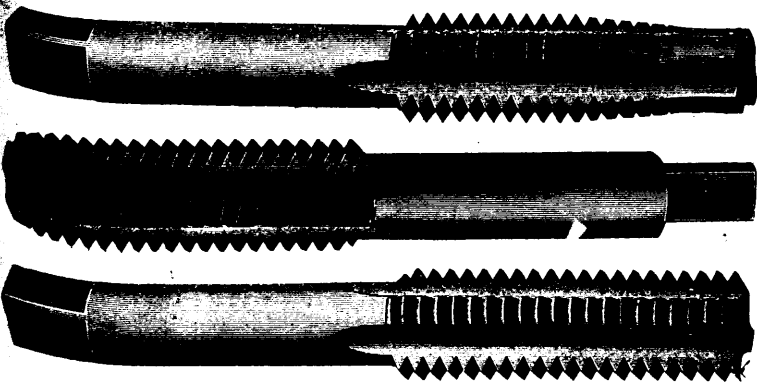


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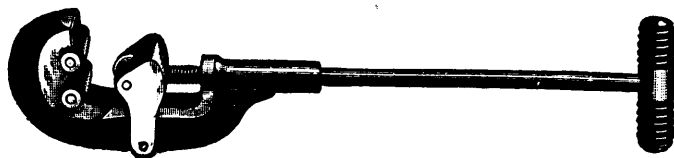
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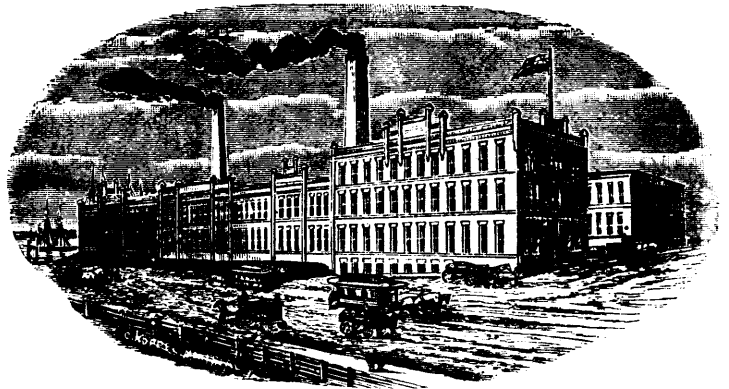
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#### PROSPERITY UNDER PROTECTION IN THE SOUTH.

THE corner stone of the late Southern Confederacy was in two pieces, one of which was human slavery and the other Free Trade. Its constitution provided that no import duty should ever be levied. When the war of the Rebellion closed it found the South deprived of its slaves, and under a government that was highly protective. For years and years the people of the South moped and sulked under their disinclination to recognize the new order of things; and while their section was suffering from stagnation and inanition, the North was making giant strides on the road to greatness and prosperity. Protection did it. While the cotton fields of the South were but poorly cultivated, and the owners of the soil were but too meagrely remunerated for the uses it was put to; while dispirited whites and discontented blacks were bemoaning their condition; the tall chimneys of the north were belching forth their smoky signals of industry; the artisans were contented and happy amid the clang and rumble of machinery; the storehouses were filled with merchandise, and the farmer was happy in the consciousness that he was producing the food to feed the country.

The South could not always remain in the condition in which it is pictured. The irrepressible nature of the people demanded that there should be a resurrection from the ashes of their despondency into the higher and nobler life of well directed toil and remunerative industry. The land contained all the elements required to make a nation rich and prosperous, even if such a thing as the cultivation of cotton should be entirely abandoned. Capital was invited to develop the iron mines; to build furnaces, and rolling mills; foundries, machine shops and factories; and with the investment of capital in this direction came a happy change. Iron is produced, it is claimed, cheaper than it can be in Pennsylvania—certainly cheaper

than in New England; and now we see cotton mills springing up all over the land, and yarns and woven goods manufactured within sight of the fields whereon the cotton grew.

Protection has accomplished the change. Protection has enabled the establishment of these industries; and throughout the South thrift and industry prevail where despondency before prevailed. The people of the South have discovered that they do not want Free Trade; and discovering this they see that the Southern Confederacy for which they so much yearned, and for which they sacrificed so much, established on the lines which they thought would lead to national greatness, was not really what they needed. The lesson of the Rebellion was a terrible and expensive one, and they were long in fully comprehending all it meant; but the people of the South now understand that their path to prosperity lies parallel with that of the North. They have discovered that "the nation that manufactures for itself, prospers."

A recital of some of the evidences of the growing greatness of the South illustrates our contention. Recently compiled reports show that during the first nine months of the current year a total of nearly 2,500 industries were established there against only about 2,000 for the corresponding season of last year, including agricultural implement factories, barrel factories, breweries, brick yards, boot and shoe factories, cigar and tobacco factories, cotton and woollen mills, cotton compresses, electric light works, flour and grist mills, foundries and machine shops, glass works, ice factories, natural gas companies, oil mills, potteries rolling mills, wood working establishments, etc. Thirty blast furnace companies were also formed during the period indicated, sixteen gas companies, sixty-four water-works companies, 250 railroad companies, and 198 mining companies. In fact a uniform expansion in all manner of industrial enterprises is shown throughout the entire South. Protection is the cause of it.

Perhaps the most remarkable development of industrial enterprise in the South is that shown in the growth of cotton manufacturing in South Carolina. That State had always been under the domination of the cotton and rice planters; and these were always of that aristocratic class that looked with contempt upon the "poor white trash," esteeming them as being absolutely lower in the scale of civilization than their negro slaves, and not near as valuable to the community. These aristocrats usually lived abroad a greater portion of the time, were always staunch upholders of the "divine institution of human slavery," and out and out Free Traders at all times and under all circumstances. They were always Bourbons of the most ultra type, for they never learned anything new or useful, and they never forgot the traditions of their ancestors and predecessors. Therefore we think it remarkable that South Carolina, thus dominated, should have so successfully passed from under the Bourbon yoke and outstripped all her sister states in the race for industrial progress for which they are all so emulous. For years, and until last year, Georgia stood in the lead of all the Southern States as the largest producer of cotton goods; but in 1888 South Carolina consumed 132,000 bales of cotton in her cotton factories, as against 120,000 bales consumed in Georgia factories. Two years ago South Carolina consumed less than 100,000 bales, and the increase of thirty-three per cent. in that time is phenomenal. Protection

and an appreciation of the situation has done this for the heretofore Bourbon State of South Carolina. This result has been accomplished by constant agitation and discussion. The people understand that their chief hope for prosperity lies in manufactures. They offer premiums and bonuses and inducements there just as we do in Canada for the establishment of industrial works and the building of tall chimneys.

The lesson impresses upon Canadians the importance of clinging very tenaciously to our National Policy.

#### CUI BONO?

"THE free entry into Canada of American manufactures and other things which can be produced in the United States better or more cheaply than in Canada, has been regarded rather as the condition upon which the Americans would consent to receive our products, than in view of its own intrinsic benefit. Yet it is clear that the benefit of getting American manufactures free of duty would be very great, and would be shared not only by the farmers, but by the majority of the other citizens of Canada." Thus saith the *Toronto Globe*. A partial idea of this benefit, says the *Globe*, may be obtained by glancing at the duties paid upon a few of the leading imports from across the border; and it illustrates this idea by showing the value of some of these imports, thus:—"On sugar, valued at \$719,529, imported from the United States, duty was paid to the extent of \$459,432. On furniture, the duty paid was \$75,164, and on housefurnishing hardware, \$82,000. The aggregate duty on cotton manufactures of various kinds imported from the U. S. was about \$214,000. The duty paid on sewing machines was \$39,000, and on various other machinery, \$322,000. The duty on carpenters', coopers', cabinetmakers', and other mechanics' tools, was \$59,000; on builders', cabinetmakers', harnessmakers', and saddlers' hardware, \$144,000; on hats, caps and bonnets, nearly \$140,000; on agricultural implements, nearly \$52,000; on bituminous coal, over \$693,000; on crockery and china-ware, \$20,100; on books, \$62,000; on baking powders, \$19,000; on clocks and parts thereof, \$36,000; on manufactures of brass, \$87,000; on various manufactures of steel, over \$100,000; on sole leather, \$34,000; on boots and shoes, \$41,000; on other manufactures of leather, \$18,000; on lamp shades and chimneys, \$51,000; on an import of \$407,999 worth of American oil, \$325,000."

If the *Globe* proves anything in favor of Unrestricted Reciprocity, it proves more in favor of Protection and our National Policy. The *Globe* and all the other Free Trade papers argue that Protection is wrong—that it unduly and unnecessarily enhances the price of all commodities, and that similar commodities may be bought cheaper in Free Trade countries, the difference being measured by the amount of the duty imposed. We all know this to be the standard Free Trade argument. The average *ad valorem* amount of duties paid upon dutiable foreign goods imported into the United States is higher than that paid upon dutiable foreign goods imported into Canada. In other words, the American tariff is higher than the Canadian tariff. The American duty on sugar is quite as high as the Canadian duty; and this being the fact, and if the price of the protected American sugar is enhanced to the extent of the duty above what unprotected sugar should be, why is it that Canadian importers of American sugar consent to pay \$459,432 more

for it than what similar sugar could have been bought for in Free Trade England? The importers either paid too much for this protected American sugar, or the *Globe* is wrong in its contention that the duty is added to the price. It tells us that the aggregate duty on manufactures of cotton imported from the United States was about \$214,000. Now cotton is produced in the United States, and there is no duty levied upon it when imported into Canada; and so far as the matter of duty is concerned, both Canada and the United States stand on the same level with Great Britain. But the United States is a very large importer of British cottons: Canada is an importer of both British and American cottons, and Canada is a serious competitor with both the United States and Britain in the China and Japan export cottons trade. What do these facts prove more than that there is an interchange of certain lines of manufactures that are not manufactured to the same advantage in the importing as in the exporting countries. Sewing machines, according to the *Globe*, should be made cheaper in Britain than in the United States: but if Canada bought largely of sewing machines in the latter country, it was either because, under Protection, they were cheaper there, or that, under Protection, they had attained an excellence unequalled in Free Trade Britain. So, too, regarding mechanics' tools, hardware, hats, agricultural implements, crockery, and all the lines enumerated by the *Globe*. In a fair stand-up fight for supremacy between Free Trade Britain and Protected America, although the former possessed untold wealth, unbounded enterprise, every appliance and convenience conceived of, and the prestige of long undisputed commercial sway, the latter has steadily gained upon the former, and to-day American goods successfully compete with British goods in the home markets of Britain.

The *Globe's* argument is a strong one in favor of Protection, and Canada will not abate that feature of our National Policy in favor of the United States.

#### CONFUSED WEIGHTS AND MEASURES.

ALL business men appreciate the difficulties constantly arising in commercial transactions growing out of the confusion incident to the difference in weights and measures in common use. That there should be some national, not to say international, legislation on the subject is apparent. No doubt there are many great obstacles in the way of any thorough systematizing of weights and measures, but these obstacles ought not to prevent efforts being made in that direction. Trade suffers from the evil, and the evil should be remedied.

The French metric system of measurements commends itself strongly, and in some countries this system prevails to the exclusion of all others, while in some other countries there are mixed methods, where the advantages of the metric and the incongruities of our old English methods are strangely conglomerated. Old habits and traditions make us to cling tenaciously to our clumsy English system, while our better judgment, formed from long and careful observation, tells us that a better and more accurate system should prevail.

This matter is exciting considerable attention in many of the commercial centres of the world, and it is to be hoped that out of all the discussions being had regarding it, some scheme will be evolved by which it will be possible to break away

from the prejudices and customs of the past, and to agree upon some method by which the old couplet :

A pound's a pound  
The world round

may be a realized fact. A writer in the Philadelphia *Manufacturer*, speaking of the indefiniteness of some terms applied to measurements, alluding to the fact that the United States Government has offered a large premium to the builders of some of the new naval vessels for each extra quarter of a knot in excess of a given speed, says that there is no statute law defining the length of a knot. A knot is one sixtieth of a degree of the circumference of the earth, but of course this distance cannot be accurately reduced to yards. There is a precise standard legalized yard, but who can tell precisely how many of these yards are contained in a knot, or how many of them shall constitute a legal knot. Large contracts, sometimes involving millions of dollars, are based on the indicated horse power of engines, but engineers are not fully agreed as to what a horse power really is. A gross ton is usually understood to mean 2 240 pounds, but not always, and in many transactions a ton is the equivalent of 2,000 pounds. An avoirdupois pound contains 7,000 grains, and a troy pound 5,760 grains. The avoirdupois ounce contains 337½ grains, and the troy ounce 480 grains. There is no legal weight of a bale of cotton, for a bushel of each kind of cereals, root crops and fruits, and no legal size for a barrel or basket. The rapidly increasing electrical business demands the legalizing of their special terms of measurements. Electricity is sold by measurements just as exact as those used for wheat or cotton. Contracts involving millions of dollars are annually made in this branch of industry, based on well defined measurements, but they are not legalized. The ampère, the ohm, the volt and the candle power should have a legal meaning defined by statute laws. A standard legalized wire gauge would be of immense service to the electrical fraternity.

#### AMERICA FOR AMERICANS.

JAMES MUNROE, while President of the United States, declared that America should be ruled by Americans, meaning that the policy of all independent American nations was to steadily discountenance the existence of any and all paternal power on the part of any European nation over any portion of the American Continent. It was in accord with this doctrine that, during the time of the Rebellion, Maximilian, the so-called Emperor of Mexico, and Louis Napoleon, whose puppet he was, were forced to abandon their idea of establishing a European Empire in Mexico. The Southern Confederacy was not averse to the scheme, and would gladly have made a declaration to that effect in exchange for "recognition" as an independent nation on the part of France. It is believed that had France acknowledged the independence of the Confederacy, it would have led to war with Britain; and Jeff. Davis could not afford to antagonize that nation.

Time was when Europe exercised complete political and commercial domination over the entire American continent. Spain had the lion's share, holding nearly all of the southern part of North America, the most valuable of the Antillean Islands, and nearly all of South America; Britain and France held the greater portion of North America, some of the West

Indies, and a small portion of South America. The American Revolution deprived Britain of a very large and important portion of her North American possessions, and the United States subsequently acquired from France and Spain all their possessions therein. Mexico and the Central American States shook off the Spanish yoke, leaving that country nothing except Cuba, Porto Rico, and one or two of the smaller West India Islands. Brazil became independent of Portugal, and the small sub-divisions of Guiana are all that is left to the British, French and Dutch in that portion of the world. In North America, Britain maintains political connection with the Dominion of Canada and Newfoundland, and one or two small islands of the West Indies. With these last-named exceptions, the countries of the Western Hemisphere are dominated by their own governments.

That is politically. Financially, this is not so; for while the political power of Europe in America has been broken, the Old World retains commercial domination over the greater part of the Western Continent, and it is with the hope that even this shackle may be thrown off that the United States Government have invited representatives of all the other independent American States to visit their country. They hope that a new order of things may be brought about, and that closer commercial relations may be established between them, forming a Zollverein which will eventually dispel and overthrow the commercial domination of Europe as completely as its political domination has been.

It is the hope of the United States that the International Congress will find a way to issue another great and general declaration of independence against Europe—a declaration that will free all America from the control of European commerce and finances. The statesmen of the United States argue that the American Continent produces and manufactures everything that its various peoples need, and they hope that the deliberations of the Congress will be carried out in such a manner as to bring mutual benefit to all the American nations, and to strengthen their general political standing.

The scheme is a fine one, particularly for the United States; and it would not do to say that it is entirely unfeasible.

#### LABOR SAVING MACHINERY.

A FEW days ago in Hamilton, Ont., Mr. T. V. Powderly, Grand Master Workman of the Knights of Labor, delivered an address, a synopsis of which was published in the daily papers. Alluding to the changed conditions of labor, by which such divisions are made that no workman completes any piece of work upon which he may be engaged, Mr. Powderly is reported as saying:

We don't find the shoemaker and the tailor working in their own shops nowadays. That work is done by machinery. And when it was found that a man's strong arm was no longer required to perform the labor, women and children were employed; and if the men do not take up this question soon they will find themselves walking the streets in idleness. Men of different trades say machinery cannot do their work, but experience shows that machinery can be so perfected as to perform every description of work. The type of a newspaper in New York is now set by machinery, and the time will come when the delicate fingers of women will feed these machines, and the men will find themselves buttoning their coats about four inches further around their attenuated frames.

Mr. Powderly's meaning is that the laboring man is not benefited by such labor saving machinery and devices as is in use nowadays. Is he correct in his conclusion? Machinery has of itself created numberless new industries, all of which require the services of skilled workmen. Modern machinery has imparted value to what was before waste. We call Mr. Powderly's attention to a recent invention in his own country by which scraps of tin are manufactured into nails. Usually a price is paid for the removal of scrap tin from tin working factories. It requires skilled workmen to build the machines by which scrap tin is made into nails; and intelligent workers are required to operate these machines. Mr. Erastus B. Bigelow, of Boston, Mass., several years ago stated that "while machinery had trebled the total productiveness of the country, but little more than twenty per cent. of the population is employed, and probably less than one half of these are engaged upon the parts of the work to which machinery is applied; hence the labor of not more than ten per cent. of the population is aided productively by modern inventions and improvements." This fact is not contradicted in the census and labor bureau statistics.

BALANCE OF TRADE.

FREE Traders argue that if a nation would sell its products to other nations, it should buy of their products. Thus, if Canada desired to cultivate trade with Brazil, it should not only send Canadian products to that country, but it should also buy such things as that country produces. Considering the meeting in the United States of the International American Congress, and the objects hoped to be accomplished by it, some facts regarding the traffic between the United States and some of the other states taking part in that Congress, may be appropriate. The imports into the United States last year from Mexico, the West Indies, Central America and South America were valued at \$181,000,000, while the exports to those countries amounted to only \$72,000,000. According to *Bradstreet's* the trade of the United States during the year ending June 30, 1888, with three leading South American countries, was as follows:

	Imports.	Exports.
Argentine Republic.....	\$ 5,902,159	\$6,099,411
Brazil .....	53,710,234	7,063,892
United States of Columbia .....	4,393,258	4,923,259
Totals.....	\$64,005,651	\$18,086,562

Here there is exhibited an excess of imports of about \$46,000,000, of which no less than \$44,000,000 is made up of two items from Brazil—coffee, \$33,460,595, and India rubber, \$10,811,952. Both of these commodities are free of duty. The other principal imports from the countries named are dutiable. The leading exports are agricultural implements, carriages, flour, lard, kerosene oil, cotton cloth, sewing machines, steam engines and lumber. Most of the finer manufactures which enter into South American consumption are drawn from Europe.

The following table shows the imports from the countries named into the United States during the fiscal year alluded to:

	Free.	Dutiable.
Argentine Republic.....	\$ 4,560,071	\$1,342,088
Brazil .....	46,873,824	6,836,410
United States of Columbia .....	4,244,368	148,890
Total Free.....	\$55,678,263	
" Dutiable.....		8,327,388
Grand total.....		\$64,005,651

The comments of *Bradstreet's* regarding this discrepancy are worthy of consideration. It says:

Three important obstacles lie in the way of an increase of our exports of manufactures. One is the comparatively little inclination of the average manufacturer to secure South American trade, as is shown by the almost utter want of intelligent effort in that direction. Goods cannot be sold in South America in competition with Europe, all other things being equal, without at least as much attention to the details of the business as Europeans are in the habit of giving. This attention at present, generally speaking is wanting. Consul General Baiz, of Guatemala and Honduras, said the other day very truly: "Our manufacturers, unfortunately, do things by fits and starts. When the market is overcrowded they look around to develop an export trade, but the moment that the home demand increases they bother with the development of the other kind of trade no further until the next period of stagnation." This way of doing things, of course, will never drive the more zealous Englishmen, Germans and Frenchmen out of the Spanish American markets; and there is little likelihood of a change in the way so long as the domestic market is usually as profitable as at present. A second hindrance is the ordinarily higher price of American than European goods. The third obstacle is our tariff duty on sugar, wool and certain other less important South American products. To this some would add a fourth hindrance, viz., the lack of adequate transportation facilities. But it may be taken for granted that when our manufacturers are ready to cultivate South American trade as sedulously as North American, to offer as low prices as their European rivals, or lower, and can take in exchange for their goods all the products which their customers have to sell, ships enough to carry the merchandise will apply for freight.

LABOR IN FREE TRADE ENGLAND.

FREE Traders invite Canada to forego that system of Protection under which laboring people here earn their living, and adopt that of Free Trade under which laboring people in England starve. The *Liverpool Mercury* is not a Protection paper, but it is reliable, and whatever facts it may state may confidently be accepted as such. Discussing the condition of laboring women in that country it says:—

"That 'The Song of the Shirt' is still sung in our large towns by wretched women scarcely able to keep body and soul together is proved, only too conclusively, by the revelations recently made before the Sweating Committee of the House of Lords. It was hoped that the introduction of the sewing machine would improve the condition of the seamstress, and this expectation has been so far realized that the women employed as machinists are able to earn decent wages; but the 'finishers,' those who make the button-holes and do such like work, are in an evil case, for toil as they may they cannot earn sufficient to provide the barest necessities of life. Evidence was given that the prices paid for shirtmaking of a cheap sort by great London firms are too low for the workers to live by them, even if they received the whole of the money; but it was further shown that middlemen, or 'sweaters,' absorb a large proportion of it, in some cases as much as 50 per cent. These men take the work in large quantities from the wholesale houses and then give it out to women living in poor neighborhoods at their own prices. 'They go about the east end of London and do almost what they like with their victims; no one can trace them; the women are terror struck, and will not give evidence.' They exercise the most horrible tyranny, sometimes withholding wages on the merest prettexts. One man lately deducted a whole week's wages from a woman because she was ten minutes late with her work, which so aggravated the neighbors that they smashed his windows. The consequences of this state of things are almost too sad to be told. Witnesses hesitated to describe them. A respectable



woman who earns a few shillings a week in shirtmaking to help out her husband's wages was questioned as to a girl who resided next door who had no other resource. 'Can she live on the wages she earns? No—What is the result? I can guess.' This is common, and is owing to the low wages paid by the 'sweater.' The competition of unskilled labor is at the root of this evil, as is shown in the following instance: An old woman, 75 years of age, does finishing at 4d. per dozen, and can do two dozen a day. The cotton costs her  $\frac{1}{2}$ d. a dozen, which she provides herself. The woman was of course starving, but her poor neighbors sometimes sent her in a little food. Such is the kind of evidence given in abundance before the committee appointed to enquire into the sweating system, and a remedy seems hard to find."

#### TECHNICAL EDUCATION.

LABOR organizations and labor orators generally are opposed to technical education in schools. They say that the system is calculated to produce large numbers of what will inevitably be "jack-leg" mechanics, who will compete in the labor market with more experienced and better workmen. They lose sight of the fact that with even the rudimentary knowledge of a trade a boy may acquire in a technical school, he is in a better condition to battle with life when he is thrown upon his own resources than if he were in entire ignorance of such trade. Ignorance and vice go hand in hand; and the records of penal institutions show that but a very small proportion of their inmates ever learned manual trades.

Mr. D. O. Kellogg, of Philadelphia, says that the most complete system of industrial education in the United States is connected with the penal institutions there. There are about forty houses of refuge and juvenile reformatories in the Northern States, and a dozen penitentiaries and prisons which are genuine industrial schools. They not only train the hand to the use of tools, but also have regular instruction from textbooks. There are some 15,000 inmates of these institutions, the *per capita* per annum cost of supporting them, after deducting their earnings, being \$122. In other words, the tax-payers contribute nearly two million dollars yearly to teach these youths how to lead an intelligent and useful industrial life. Mr. Richard Vaux, the philanthropist and penologist, who has for years devoted himself to the study of the subject in Pennsylvania prisons, calls attention to the fact that only about ten per cent. of the prisoners who pass through the Eastern penitentiary have acquaintance with any form of skilled industry, while a large majority of them have learned to read and write, presumably in the public schools. It is an economical and moral pity, says Mr. Vaux, that the advantages given to those who fall under the retributive hand of the magistrates should be denied to any of our reputable households, where no reproach lies, and humble circumstances are the chief obstacles to higher usefulness. By such means, however, society finds itself forced by the tax assessor to contemplate the requirements made upon it by new industrial conditions, and then it will voluntarily take up the better methods of a higher order.

#### EDITORIAL NOTES

The Dominion Government have appointed November 7 as Thanksgiving Day.

THE attention of the United States Government has been directed to the alleged fact that a process has been discovered in Ireland for producing in five minutes dry natural flax straw of the color of cotton and as fine as silk.

MEN work in the collieries at Durham, in Free Trade England, for small pay. Screenmen labor 11 hours for 75 cents, and firemen 11 $\frac{1}{2}$  hours for 86 cents. The best paid class are hewers, who get \$1.15 per day of seven hours. Laborers get only 72 cents for eleven hours work.

THE establishment of a tin plate works at Pittsburg, Pa., is a fixed fact. A suitable location has been secured, and it is expected that the works will be in operation within a year. This means that the United States duty on tin plates is to be increased to at least two cents a pound.

AT a recent meeting in this city of the Canadian Legion, Mr J. R. Roaf gave figures showing that in Ontario, out of a total assessment of \$716,000,000 not less than \$106,000,000, or 15 per cent. was exempt from taxation; and that the consequent loss of revenue from that cause amounted to \$1,300,000 annually.

A ST. LOUIS, Mo., gasoline stove manufacturing company are filling an order for several hundred gasoline stoves, ovens and other furniture for same for Melbourne, Australia, which they have contracted to send via New York and London, all the way by steamer. They have also received an order for some of the same specialties for the Argentine Republic.

AN English exchange says that an Asiatic ship canal is proposed to connect the Brahmapootra river in India with the Yang tse-Kiang river in China. It is stated that the canal would enable good-sized steamers to go direct from Chinese ports to Calcutta, and would greatly shorten the new route from England to India via the Canadian Pacific Railway.

THE jawsmiths never miss an opportunity to raise Cain when their attention is directed to a newspaper that uses "boiler-plate" matter. They argue that where such matter is used it is to the disadvantage of labor, for it deprives printers of work. But it is too funny to see a regular out-and-out labor paper printing over twenty-three columns of boiler-plate matter where only forty columns are possible.

THIS time it is in Toronto. A few days ago the workmen employed by Messrs Robert Snarr & Co., stone-cutters and contractors, went out on strike because Mr. Robert Snarr declined to discharge Mr. William Hobson, his partner in business. The strike was ordered by the Stone cutters' Union, and, according to the city papers, the men were determined to stay out until Mr. Snarr discharged his partner. They will probably stay out.

SPEAKING of the International American Congress now on the tapis in the United States, *Bradstreet's* says: "Immediate practical results from the conference are not very hopefully anticipated in commercial circles. The delegates are powerless to enforce even the mildest of their recommendations, and the

influence of their action on the Congress of the United States, to say nothing of the various South American governments, hardly bids fair to be pronounced. The discussion, however, will not prove valueless if it results in the further spread of information about the facts and principles involved in the commerce of this continent."

MENTION was recently made in these pages of the large steam tug *Lorn*, built by the Albion Iron Works Company, Victoria, B.C. Since having gone into commission this tug has demonstrated her excellence by towing some very large and heavily loaded ships in a sea-way where the wind was very high and the water exceedingly rough. As a specimen of Canadian marine architectural skill she is unexcelled. Her triple expansion engine is said to be the largest ever built in Canada. The forgings for this engine, also the crank and shaft, were manufactured by the Nova Scotia Steel and Forge Company, New Glasgow, N.S., and this company is prepared to do any similar work, illustrating the fact that no necessity whatever exists for going out of Canada for any such work. The forgings for the largest locomotives ever built in Canada—for several now being constructed at the works of the Canadian Locomotive and Engine Company, Kingston, Ont.—and the heavy forgings for the largest saw mill in Canada—the McLaren-Ross mill at Westminster, B.C.—were also made at the New Glasgow works. During the past year that concern have sent to Canadian manufacturers of agricultural implements over 12,000 tons of steel for the purposes of their business. Canada is proud of her steel works.

AN American exchange speaking of the electric bell swindlers now swarming over the country, says:—

"People who are building houses for themselves or others and people who are ambitious to provide their homes with the modern improvements, should be on their guard against the electric bell swindle. Electric bells may be all very well when they are properly put in, but probably half of them are a weariness to the flesh, a cause of social misunderstandings, and an unmitigated nuisance, because they are not properly put in or properly cared for afterwards. The electric bell swindler is a person who presumes upon the general ignorance of electrical appliances, and the general ambition to be well up towards the head of the procession. He has a card. He ostensibly has a place of business where he may or may not be found. He has a small kit of tools, a smaller knowledge of the rudiments of an electrician's business, and the glib tongue and boundless assurance of the old time lightning-rod agent, whose residuary legatee he is. You may know him from the fact that he solicits business after the manner of the party who once secured a big job from that eminent political economist, Mark Twain. He invades your home when you are away, tells your wife all about it, puts in a door bell and a foot push under your dining room table, establishing communication with your barn if you have one, fortifies you, so to speak, with burglar alarms, sees that things work until he collects his bill, guarantees satisfaction for a year, and then fades into the imperceptible."

THE opening of the new dry dock at Halifax, N.S., is a matter of the highest importance to Canada and to England in connection with the large merchant marine of both countries and also with the Imperial Navy. It is the only dock on the Atlantic British seaboard suitable for men-of-war, and is one of

the largest in the world. Although not a portion of the Government dock-yard, it will, of course, be available for use by all ships of the Royal Navy. The largest merchant steamer or man-of-war can enter for repairs and can at the same time receive a full complement of coal. The dock has taken five years in building. Elaborate machinery was brought expressly from England. Special apparatus for diving was procured and skilled workmen and engineers employed. The dock is peculiarly situated. It is at the northern end of the harbor, just beyond and in close proximity to Her Majesty's dock yard, and right below Wellington Barracks, where the Imperial soldiery are quartered. It is built into the side of a high bluff. The cost of construction goes up into the millions, but is still far less than the cost of any previous similar dock built by England. The total length is 600 feet, it is 70 feet wide at the bottom, and 100 feet at the coping. It has an extreme working length of floor of 568 feet, and the depth of water on the sill at ordinary spring tides is 30 feet. The dock is built on solid rock. The pumping capacity of the engines emptying the dock is such as to enable it to be done in four hours.

OWING to the higher prices of English, Scotch, and Canadian pig iron, United States brands are being sold very extensively throughout Ontario, a letter to that effect having been received in this city from a Toronto firm which complains of the difficulty now experienced in making sales of Scotch and Canadian iron owing to the cheaper values offered by United States houses for qualities fully equal to some of the leading brands supplied by Montreal firms. This is quite a feature in the trade, which is of no little importance, being a new source of competition from an unexpected quarter. What are our manufacturers about, with their big bonus and high protective duty, that they should allow Americans to undersell them in the Canadian market?—*Montreal Trade Bulletin*.

It would be in order for some of the Free Trade journals to arise and explain the meaning of this anomaly. English and Scotch pig iron is made under Free Trade; Canadian and American pig iron under Protection. The Free Trade theory is that the duty always enhances the cost. Thus, if the cost of making pig iron is the same in England, Scotland, the United States and Canada, the cost of pig iron in Canada, made in England, Scotland or the United States, should be the Canadian cost plus the duty of four dollars per ton. The duty on pig iron imported into the United States is six dollars per ton, and the price of all American pig iron, according to this theory, should be the general price plus six dollars per ton. But here we see protected American pig iron selling in Canada at actually less than Free Trade British pig iron.

THE contracts have been signed for the construction of the new line of ocean steamers for the Canadian Pacific Railway Company, and work upon them will be pushed with great vigor. There are to be three of these vessels, and they will be operated on the route between Vancouver, B.C., and China and Japan. They are to be 6,000 tons each, with twin screws, and will have a speed of eighteen knots per hour. They will have steel cross and longitudinal bulkheads up to the main deck, and they will be built under Admiralty supervision, with the view of making them effective in time of war, as under the arrangement between the British Government and the Inman, Cunard and White Star Companies. The plans show that every improvement for safety, as well as for economical

working known to marine engineering, has been adopted, and particular care taken to fit these vessels for the special service for which they are intended. They will be luxuriously fitted and furnished, the builders proposing that they shall surpass any now afloat in this particular. The cabins are to be larger than is usual on board ocean liners, with folding berths, and when required, rooms *en suite*. The facilities in the way of hydraulic machinery for handling cargo are of the latest invention. Altogether these vessels will be a fitting adjunct to the railway, for whose customers they are particularly intended, and will make with it the most complete through service in the world.

AN American contemporary discussing the question of the organization of labor as now practiced, shows that laboring men have not gained enough through their unions to pay for the expense of maintaining them, to say nothing of the cost of strikes. It says that all wages advanced during the twenty years from 1860 to 1880, in some occupations more than in others, but that it does not appear that the organizations secured the greatest advances. The minimum gain in any class of labor—that of iron mining—was only 14 per cent.; and the miners' organization was almost as extensive, and fully as aggressive as any of the others. The employes in the 25,000 flouring mills, scattered all over the United States, had little if any organization, and did no striking; yet their wages advanced 33 per cent. The boot and shoe workers, with a costly and extensive organization and frequent strikes, gained but 37 per cent. advance in wages; while the blacksmiths, who were too much scattered for effective organization, and who, as a general thing, avoided participation in strikes, gained 47 per cent. Carpenters in thorough union gained but 35 per cent., while coopers, whose organization was very loose, gained 60 per cent. Cigar makers, whose strikes were the most frequent and most costly, gained only 28 per cent. These facts confirm the belief that workers, if left alone by the professional labor agitators and free to make whatever arrangements with their employers that their qualifications might secure, were the successful ones in obtaining the best wages.

ACCORDING to the latest reports of the Bureau of Statistics of the Treasury Department at Washington, the United States exported during the fiscal year ending June 30, 1889, agricultural implements and machines, and parts of such machines and implements, to the value of \$3,623,769, as compared with exports of a similar character the previous year valued at \$2,645,187. This is an increase of nearly a million dollars—about 37 per cent. Of this aggregate, the Argentine Republic received the largest proportion, her imports of such machinery and implements from the United States amounting to \$1,069,320 in value. Other South American countries together took only \$289,410 worth. Great Britain and Ireland came second, \$456,926 representing their share; France was a purchaser to the extent of \$256,306, and then followed the Australasian colonies, \$249,404; Africa, \$213,045; Germany, \$205,655; and British North America, \$138,368, the latter small amount being a speaking tribute to the success of Canada's efforts to furnish her own manufactures, agricultural goods being a very prominent item in the requirements of the

country. All the European countries not included in the above list, together took agricultural goods to the value of \$575,470. An analysis of the character of the exports proves interesting. Mowers, reapers and their parts took up \$1,987,000; plows and cultivators and parts of same, \$705,262, and horse powers \$15,974, leaving but \$915,480 for everything else that could be classed in the category of agricultural implements. The largest increase, as well as the largest sales, was credited to mowers and reapers, and amounted to more than half a million dollars.

THE owners of steamships and vessels of all kinds which are engaged in the freight and passenger traffic on the lakes between Buffalo, Erie, Cleveland, and other Eastern ports, and the shipping centres of the Northwest, are anxiously awaiting the coming session of Congress, in the hope that large appropriations will be made by the Federal Government to complete and make various improvements that are greatly desired. The most important improvement now under way is the St. Mary's ship canal at Sault Ste. Marie, Mich. There is here already the comparatively new canal, but it is not sufficient for the traffic passing up and down the lakes. This canal was originally owned by the State of Michigan, but it has been enlarged and improved by the Federal Government. The lock which has been built is one of the finest in the world, and the new one, now under way, will surpass anything of the sort in existence. The lock is 515 feet long, 80 feet wide, and has a lift of 18 feet. The structure is a massive and substantial one, built of granite, and has all the latest and best machinery for operating the gates. This will now hold two large lake steamers, and a tug or two can squeeze up close to them. With two steamers in the lock, it can be filled inside of fifteen minutes. The waters boil and surge below, as they do at a base of a waterfall. The canal leading into the lock is about half a mile long, and has a depth of over 20 feet. The new lock, for which an appropriation of \$4,000,000 is asked, will be 800 feet long and 100 feet wide, with a depth suitable for the deepest lake steamers. Every possible effort will be made to get the appropriation through Congress. The annual increase of business through the lock is a guarantee that the new one is badly needed.—*Bulletin*.

PROTECTIONIST literature contains few finer things than the answer made by Mr. James M. Swank, in the *Bulletin* of the Iron and Steel Association, to the iron manufacturers of New England who have been asking for free coke, coal and ore. We greatly regret that there is not room enough in these columns for full reproduction of the article. Mr. Swank takes up all the arguments and assertions made by the complainants, and literally tears them to shreds. Even such rabid and unscrupulous free-trade journals as the *Boston Herald* and the *Providence Journal* indicate in their feeble attempts to reply that they realize the tremendous force of his statements. Mr. Swank shows that removal of the duties upon ore, coke and coal would affect the cost of iron only to the extent of \$2.06 a ton, whilst the iron producers would lose \$3.22 a ton by withdrawal of the duties upon foreign pig iron. He proves that there is in the Dominion no ore that any New England maker would care to import, even free of duty; that the Nova Scotia

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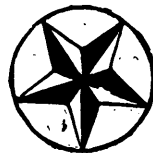
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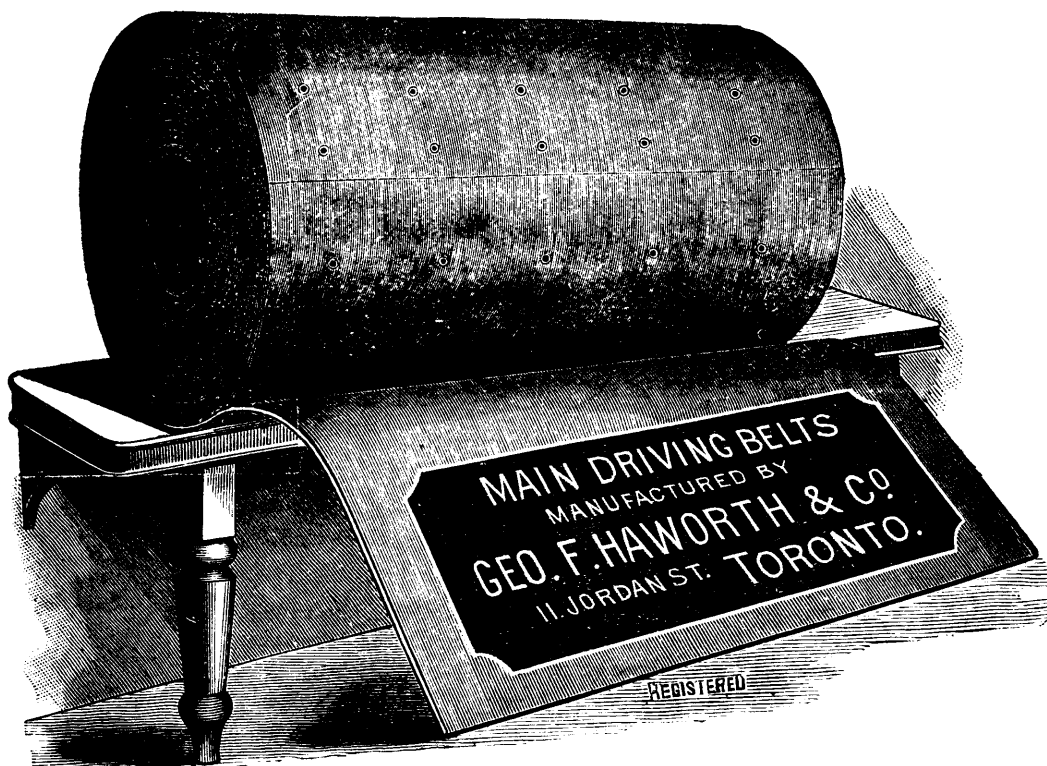
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coke fit for furnaces may be had in only trifling quantities, and that it is far inferior to the best American coke; that the New England manufacturers never used Canadian ore and coke during the twelve years when there was reciprocity between the two countries; and that Nova Scotia ore and coke are not used by the Canadians themselves in making pig iron. He proves that the number of rolling mills in New England has not, as the free traders allege, declined since the war, but has increased; that the product has not, as asserted, fallen off since 1880, but has enlarged; and that every machine-shop in New England has gained immensely by the great decline of the prices of pig iron following upon the development of the industry under the protective system. This is but a bare outline of a masterly argument, which should be reprinted and widely circulated in the New England States to counteract the falsehoods and the ignorance of the free trade journals which are doing harm in that region. One strong, steady blast of truth, like this, will sweep myriads of lies out of circulation.—*Philadelphia Manufacturer.*

## SPECIAL ADVERTISEMENTS.

Advertisements will be accepted for this location at the rate of two cents a word for the first insertion, and one cent for each subsequent insertion.

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**FACTORY TO LET.**—About eleven thousand square feet floor space, with engine, boilers, shafting and hangers; steam. water and gas fittings complete. Apply SAMUEL MAY & Co., 111 Adelaide street west.

MR. J. THEO. ROBINSON, publisher, Montreal, has sent us "Zorah: A Tale of Modern Egypt," by Elizabeth Balch, published by him. A more extended notice of this book will appear in a later issue of this journal.

A NEW department—"Woman's Work and Wages," under the editorial management of Mrs. Helen Campbell, of New York, an author of reputation, and well fitted for the work, will be inaugurated in the first number of the new volume of *Good Housekeeping*, which commences with the issue for November 9th. Published fortnightly by Clark W. Bryan & Co., Springfield, Mass.

CANOEISTS will appreciate a late number of the *Dominion Illustrated*, several pages of which are devoted to the meeting of the American Canoe Association at Steve Island. The views are admirably characteristic, comprising a "Group of members of the Association, with Ladies," "Early Morning in Camp," the "Tug-of-War," and "Reception at Headquarters." The number also contains supplementary views of the Quebec landslide and of Dufferin Terrace, showing the new fissure in the rock. A fine portrait of Mr. A. M. Burgess, Deputy Minister of the Interior, forms the opening page. Marksmen will enjoy the portraits of Sergeant Hall and Private Burns, prize-winners at the D.R.A.'s matches. A serial story of the Rebellion in Upper Canada is promised in ensuing numbers. The *Dominion Illustrated* is published by the Dominion Illustrated Publishing Company, Montreal. Subscription, \$4.

**HYPNOTISM.** Its History and Development. By Fredrik Bjornstrom, M.D., Head Physician of the Stockholm Hospital, Professor of Psychiatry, Late Royal Swedish Medical Councillor. Authorized translation from the Second Swedish Edition by Baron Nils Posse, M.G., Director of the Boston School of Gymnastics. Paper, 30 cents. The Humboldt Publishing Co., 28 Lafayette Place, New York. This is a timely book. Last August over one hundred and fifty "savants of incontestable authority" met in Paris to discuss the progress and development of the mysterious agency known as "Hypnotism," and as a result of their deliberations the subject has entered the domain of Science, and evidently has come to stay. The author of the present work is well qualified to write on the subject—none better—and we bespeak for the work, which is specially translated for the *Humboldt Library of Science*, an immediate success.

## WASTE POWER.

To the Editor of the CANADIAN MANUFACTURER.

SIR,—The statement that out of every hundred men engaging in business but three are successful, is a statistical chestnut which may be correct in the main, and if so, the pertinent inquiry, "What is the matter with the other ninety-seven?" is in order. This query, so far as it relates to manufacturers using steam power, has a partial answer. A leading firm has recently been pursuing a systematic series of investigations to determine what percentage of the power actually developed was utilized in production, and how much was wasted. Careful tests in some of the most prominent manufacturing concerns in the country gave some curious results.

In nearly every case it was found that at least fifty per cent. of the power was wasted. One large establishment wasted sixty-five per cent. and another seventy-three per cent., while in another,

where the engine was developing sixty indicated horse-power, eleven-twelfths of this amount was wasted in friction and other useless work, and only five horse-power was available for purposes of manufacture. In most manufacturing enterprises the cost of fuel is a very serious item, and *The Stationary Engineer* thinks it would appear to be well worth the time of the owners to start a little investigation as to what becomes of the power they pay for. Economical production of steam and judicious transmission of power from the engine to the line shaft, and from the line shaft to the different machines throughout the factory, is the beginning and end of steam using, and the manufacturer who pays no attention to these points need scarcely hope to be one of the lucky three. In general practice the shafting is too light and the hangers too far apart. Then the shaft is loaded up with heavy cast-iron pulleys, thus producing excessive journal friction. Belting does not grip well on iron pulleys, and, in order to prevent slipping, the belts have to be kept tightly laced. This excessive tension, added to the great weight of the pulleys, invariably puts the shafting out of alignment, and still further aggravates the journal friction, all of which uses up the coal heap rapidly, shortens the life of belts, and swells the engine expense account. Manufacturers would consult their own interests by using ropes and grooved hard-wood pulleys for all main drives, and light, strong, well-finished wood pulleys for all belt transmissions. The ratio of friction to pressure for leather belts, when worn over wooden pulleys, is 47; over turned cast-iron pulleys, 24. Thus showing the average advantage of a wood pulley over iron to be 50 per cent.

MANUFACTURER.

AMERICAN vs. BRITISH SHIP-BUILDING.

It is an extremely interesting and practical report which Mr. Frederick D. Wheeler, of Bay City, Mich., submits, as the ship-building expert in the Scripps League expedition to Paris. It will surprise not a few to learn that the steel vessels built on the Clyde for salt-water service are not of so strong build as those built in Cleveland ship-yards for service on the lakes; yet such is the fact. Mr. Wheeler compares the *Harlem*, built for lake service, with an A1 (Lloyds) vessel built in Scotland, and from his figures we evolve the following table:

	American Vessel.	Scotch Vessel.
Length over all.....	300 feet.	290 feet.
Beam.....	41 "	39 "
Depth.....	27 "	28 "
Main frame.....	4½x3½	4x3
Reverse bar.....	3½x3½	3x3
Bottom tank.....	260 ft.	220 ft.
Average thickness of steel plates.	½ in.	¼ in.
Bulk-heads.....	5	3
Weight.....	1,450 tons.	1,200 tons.
Contract price.....	\$275,000	\$150,000

Equally interesting is Mr. Wheeler's contrast between the wages of ship-builders on the lakes and on the Clyde. He groups them as follows:

	On the Clyde.	American Yards.
Number of hours.....	9½	10
Ship carpenters.....	15½c	30c. per hour.
Ship joiners.....	14c.	25c. " "
Riveters, ¾ to ¾, (per 100).....	20c.	30c.
Platers.....	\$1.62	\$2.00 per day.
Platers' helpers.....	87c.	1.50 "
Furnace-men.....	\$2.50	3.25 "
Furnace-men's helpers.....	\$1.00	1.50 "
General labor.....	87c.	1.50 "
Blacksmiths.....	\$1.75	2.50 "

To offset the apparent advantage of low wages, American ship-builders have, Mr. Wheeler asserts, vastly superior machinery; so that the number of employed to do any part of the work is much less in this country than abroad.

On the other hand, the Clyde get their steel much more cheaply than do the American builders, in proof of which Mr. Wheeler submits the following table:

	America.	Great Britain.
	Per 100 lbs.	Per 100 lbs.
Round Iron.....	\$1.90	\$1.65
Manufactured Iron.....	2.30	1.90
Plate iron.....	2.10	1.90

Add 12 per cent. to get the cost of steel.

As to the social condition of the ship-carpenters here and abroad, Mr. Wheeler says: "They (the foreign employes) live shabbily, and in many cases they are satisfied to call a loaf of bread and a glass of red wood wine a meal. In America, our ship workers live in their own homes, and their tables have an abundance for a good meal. They not only enjoy the comforts of life, but many of them enjoy its luxuries also."

Mr. Wheeler's conclusions as to the future of the American ship-building industry are valuable as coming from a man of wide observation and experience, and with this portion of his report we close this article. He says: "My general conclusion from what I saw abroad was, that while the foreign ship-building industry, such as that of the Clyde, was far more extensive than ours, yet that it would have to give way eventually to American manufacturers of this class. They cannot compete much longer with our American machinery and American methods; and I predict that within fifteen years America will have a good share of the ship-building now done on the Clyde, and with that start it will not be long before America will build her own ships."—Cleveland, Ohio, *Iron Trade Review*.

TECHNICAL EDUCATION.

The determination of the labor organizations of this country to restrict the number of apprentices, is one of the most alarming outrages ever allowed to exist in this or any country. It is more harmful to the future of young men than the drowning of all male babes was in antiquity. It begets laziness, fosters crime, and is a pollution of the very fundamental laws of liberty. It sets up a precedent in this country more dangerous than anarchy, that in time will disserve the union of the States, and wet with fraternal blood every institution of learning throughout the length and breadth of this land of the free. It will topple over church spires, and build reformatories, almshouses and prisons in their stead. It is more dangerous to the morals of young men than poison or the dirk-knife is in the hands of the assassin. It is a greater destroyer to young men than the chain shot to the armies of a nation. Shall that law be allowed, yea, even recognized, in a country like this? is a very momentous question for the master mechanics of this country. Let them act upon the subject, and that at once.

The National Association of Builders, to meet in St. Paul early in 1890, should adopt severe measures on the subject, and refuse to employ in any trade connected with that of building any men belonging to a labor organization that in any way restricted teaching and learning boys useful trades to practise when they become men. Each year these labor organizations become more violent in their method of restrictions, and the hour has come for the masters to choke them. Let the National Association of Builders adopt the rule, and it will not be ninety days until they are starved out of this most foul and damnable theory, so far as the building trades are concerned. That being so, other masters will rush to the rescue.

It has been only a few days since a young man called at this office, scarce into his young manhood, and with much sorrow regretted that he had not had the opportunity to learn a trade, from this fact. There are thousands of such cases all over this country, who are forced into professions and into business circles who have no aptitude or desire for such; but rather than be thrown upon the streets as common laborers, seek a higher plane, to meet with a more disastrous failure in later years; young men who have taste for mechanics, and would, if allowed to seek those trades, make honorable men and ornaments to society, but who are handicapped by a lot of botches.

Wipe out every trade organization that restricts boys from becoming useful men and mechanics, and wipe them out clean, is the demand of thousands of young men knocking at the doors of industry, that cannot be welcomed in simply from a rule of some trade assembly or organization restricting the number.

Let every boy and young man who desires to learn a trade do so. Let every boy and young man who comes to the doors of industry be protected.

Let every boy and young man who asks be taught a trade and taught it right.

Encourage honesty, uprightness and industry on every hand, at any sacrifice; they are the germs of the generations of the future, the hope of this Republic and the longevity of liberty.

Suppress any trades organization, be it Knights of Labor, Trades' Assembly, Federation of Labor, or under any other name, that seeks in the minutest degree to control, restrict, curb or check the boy or young man of this country from learning any trade that he may choose, unfettered and unrestricted.—*Builders' Gazette*.

# Manufacturing.

*This department of the "Canadian Manufacturer" is considered of special value to our readers because of the information contained therein. With a view to sustaining its interesting features, friends are invited to contribute any items of information coming to their knowledge regarding any Canadian manufacturing enterprises. Be concise and explicit. State facts clearly, giving correct name and address of person or firm alluded to, and nature of business.*

MR. D. MOORE will build a 75-barrel roller flour mill at Arden, Man.

A FACTORY for the manufacture of woodenware is to be started at Vancouver, B.C.

MR. J. SANDERSON, Prince Albert, Saskatchewan, will erect a saw mill at that place.

THE Graphite City Plumbago Company's mill, near Buckingham, Que., is now in full operation.

THE smelter and sampling works at Revelstoke, B.C., are about completed and ready for operation.

THE Chemainus Saw Mill Company, Chemainus, B.C., will erect another large saw mill at that place.

THE capital stock of the Vancouver Foundry and Machine Works will increase their capital stock to \$100,000.

THE Kingston Foundry and Machinery Company, Kingston, Ont., is being organized with a capital stock of \$60,000.

THE Fort William Foundry, Fort William, Ont., has been completed. The main building is 110x30 feet, and annex 50x40 feet.

MR. JAMES FRAZER'S woollen mills at Kincardine, Ont., were scorched by fire, Oct. 9th, doing damage to the extent of about \$2,000.

THE paint factory of Messrs. Peuchen, Vaughan & Co., Toronto, was gutted by fire Oct. 5, doing damage to the extent of about \$15,000.

MR. J. R. HICKSON, Toronto, will probably start an umbrella factory in this city, which will give employment to about 200 hands.

MR. MANSON CAMPBELL, manufacturer of fanning mills, Chatham, Ont., during the past season manufactured and sold over 3,000 of his machines.

MR. ANDREW HASLAM, proprietor of the Nanaimo Saw Mills, Nanaimo, B.C., will add considerable new machinery to his now large and effective plant.

THE Oshawa Malleable Iron Company, Oshawa, Ont., whose works are being run to their fullest capacity, will soon make an enlargement of their works.

THE town of Kincardine, Ont., has voted a bonus of \$7,000 and exemption from taxation for ten years to Messrs. Grundy of that place, for the establishment of a stove foundry.

MESSRS. COWAN & Co., Galt, Ont., are building a new 75 horse-power steam boiler for the works of the Canadian Office and School Furniture Company, at Preston, Ont.

THE Anglo-Canadian Asbestos Company are quarrying an excellent quality of asbestos at their quarry at Black Lake, Que. The company will put in new and improved machinery.

A COMPANY of Detroit and Chicago capitalists has been organized, and are erecting extensive works at Walkerville, Ont., for the manufacture of malleable iron. They will employ 200 men.

MR. JOHN DRYNAN, Almonte, Ont., has purchased the carriage factory of Mr. D. Ackland at that place, and will manufacture buggies, wagons, carts, etc.: also the Drynan patent field roller.

THE Toronto Varnish Works, in this city, of which Messrs. Mackenzie & Co are proprietors, were damaged by fire, Oct. 14, to the extent of about \$3,000. The works are being put in good order again.

THE Port Elgin Furniture and Manufacturing Company, Port Elgin, N.B., have their new factory in full blast, with all the work on hand that they can give attention to. They give employment to about twenty hands.

THE Doty Ferry Company, who operate ferries between Toronto and the Island opposite the city, are building two steel double end ferry steamers to operate on their route, with capacity to carry 1,000 passengers at a load.

THE Dominion Feed Water Heater and Purifier Company, recently incorporated in Montreal for the manufacture of the Smith feed water heater and purifier, will establish an agency in Toronto for the sale of their products.

A COMPANY has been formed at Bridgetown, N.S., who will erect works near that place for the manufacture of drain tile, brick, etc. An engine and necessary machinery have been ordered, and work will be begun early in the ensuing spring.

THE New Rockland (Que.) Slate Company are obtaining a good quality of slate from their quarries at that place. During the current year they have taken out over 16,000 squares of marketable slate, giving employment to about 200 hands.

THE new machinery recently placed in the barrel factory of the Moncton Sugar Refinery, Moncton, N.B., has been put into successful operation. It is capable of turning out 3,000 finished hoops per day. Over 400 sugar barrels are turned out daily.

THE Standard Card and Paper Company has been incorporated with a capital stock of \$10,000; head-quarters at Montreal. The objects of the company are the manufacture of prepared paper and cardboard in all its branches, and the sale of the same.

A COMPANY is being formed at Berlin, Ont., with \$50,000 capital stock, for the manufacture of scissors. Mr. Cluthe, the promoter of the scheme, claims to have discovered a process by which he can convert metal into a state so as to make it malleable for the purpose.

THE American Automatic Fire Extinguisher Company will establish works in Montreal for the manufacture of the article indicated by the name. A number of the leading firms of Montreal and vicinity have supplied their warehouses and factories with them.

MESSRS. C. ROY & Co. will erect a large plant at St. Hyacinthe, Que., for the manufacture of locomotives, and similar heavy machinery. The works will give employment to 400 hands. The municipality of St. Hyacinthe will give a bonus of \$50,000 and five acres of ground.

THE George F. Blake Manufacturing Company, of Boston, Mass., are likely to be awarded the contract for the construction of the new pumping machinery for the Parkdale, Toronto, waterworks. The pumps will be of capacity to deliver three millions of gallons of water per day.

THE Canadian Office and School Furniture Company, Preston, Ont., are placing a 24x24 foot brick addition to their boiler house. This building will then be sufficient to accommodate three sets of boilers. This is in anticipation of an enlargement of their works, which is soon to be made.

DEPOSITS of pipe clay have been discovered at Cowichan, Vancouver Island, B.C. The deposit is found in Bear Creek Valley. Specimens in various stages of rough manufacture have been forwarded to San Francisco for further opinion. A company has been formed for working the find.

A VALUABLE discovery of anthracite coal has been made at Cheticamp, Cape Breton, and on trial is said to have proved of excellent quality. One hundred barrels have been sent to England for analysis, and if it turns out as expected the mine will be at once developed to its fullest extent.

THE planing mill and sash and door factory of Messrs. F. W. Wagner & Co., at West Toronto Junction, near this city, which was built a few months ago, is a substantial structure 160x40 feet, and thoroughly equipped with the newest and most improved machinery. It is heated by steam throughout.

THE Dodge Wood Split Pulley Company, Toronto, call the attention of manufacturers and any who may be putting up new factories or refitting old ones, to the wood split pulleys made by them. They inform us that they are manufacturing a most superior line of wood pulleys for both belts and ropes.

ALLUSION was recently made in these pages of the loss by fire of the hub and spoke factory of Messrs. A. McVean & Sons, at Dresden, Ont. A new and commodious factory has been erected, and a



full outfit of new and improved machinery introduced, and operations were to have been commenced about this time.

THE nickel deposits of the Sudbury district, Ont., are being rapidly developed. The Dominion Mining Co., of Montreal, are opening up a claim four miles north-east of Sudbury, and one of the large copper-smelting companies of Swansea, Wales, is making tests in this locality. The nickel is associated with copper.

MR. JOS. BURDETT, brush manufacturer, Hamilton, Ont., has recently invented, and is turning out, a brush to be used exclusively by the canning trade. It is claimed to be far superior to the old style on account of its durability and cleanliness in operation, etc. He also makes a specialty of all kinds of machine brushes.

THE Dominion Feed-Water Heater and Purifier Company, Limited, has been incorporated at Montreal, with a capital stock of \$300,000. The objects of the company are the manufacture and sale of the Smith patent feed-water heater and purifier, and of articles incidental thereto, and to steam boilers and engines.

A BONUS by-law is to be submitted to the voters of Belleville, Ont., in favor of the Belleville Rolling Mills Company, which, if carried, will ensure the erection of rolling mills at that place. The works are to cost at least \$45,000, and the industry will start with not less than 80 men, which number will be increased to 250 within five years.

PLATINUM, associated with gold and silver, is now being worked in the Sudbury district, near Whitefish, Ont., by a Mr. Simpson, who has taken out over \$6,000 worth of these metals during the past four months. A ten stamp mill is to be put in next spring, with which the product is expected to be increased to \$50,000 per annum.

THE big mills of Messrs. Cook Bros., of Toronto, at Serpent River, Ont., which suffered from fire on Oct. 12, are among the finest on the continent. Saxe & Co., of Albany, offered \$1,000,000 for the mills and limits this past summer. The Cooks valued them at \$1,200,000. The docks and 50,000,000 feet of cut lumber were burnt.

MASSEY & COMPANY, LIMITED, has been incorporated with a capital stock of \$500,000, with headquarters at Toronto. The objects contemplated by the new company are the buying, selling, etc., all kinds of machinery, implements, wagons, carriages, utensils and goods for farming and other purposes and use, household fittings and all kinds of supplies.

BOYCE'S Carriage Works, Winnipeg, Man., has recently been considerably enlarged and new machinery added, with a view to the special manufacture of fine carriages. The works now cover an area of 100x50 feet. In addition to carriages, fine cutters and sleighs are also manufactured; and such special lines as express wagons, band wagons, etc.

THE Sarnia Oil Company's pipe line is now at work conveying crude oil from the Petrolia district to the works in Sarnia, Ont. With the facilities for bringing in their supply of crude, the Sarnia Company is now in a position to go on steadily and regularly with the manufacture of their Northern Light brand of oil, claimed to be the best Canadian product on the market.

MESSRS. M. D. BARR & Co., Montreal, through their Toronto representative, Mr. F. A. Barr, are placing what will be a most brilliant array of incandescent electric lights in the new Music Hall on King street, now nearing completion. Mr. Barr will have these beautiful fixtures on exhibition at the Permanent Exhibition of Manufactures, 63 Front street west, for a few days.

MESSRS. GEO. F. HAWORTH & Co., Toronto, manufacturers of Standard Canadian belting, call attention to the fact that they manufacture belts in any width, length, or strength required; and that they also do repairs of belts when required. The belts made by this firm are cut from the solid part of the leather only. During the year 1888, the firm inform us, their sales of belting aggregated over 200,600 feet in length.

THE Dominion Wire Manufacturing Company, Montreal, have just received at their works at Lachine, near that city, twenty car loads of machinery intended for the manufacture of gimlet-pointed screws, in which industry they are about to engage extensively. It is expected that these works will be put in operation about the beginning of the coming year; and that their output of screws will be about 2,500 gross per day.

THE Polson Iron Works Company, Toronto and Owen Sound, Ont., have just contracted to build a second ferry steamer for the

Canadian Pacific Railway Company for transporting trains of cars across the Detroit river between Detroit, Mich., and Windsor, Ont. This steamer will be a duplicate of the one now on the stocks at the Polson's shipyard at Owen Sound, and which is to be launched in a few days. These vessels are built of steel and 295 feet long.

MESSRS. T. & W. MURRAY, of Pembroke, Ont., have sold their copper mine near Sudbury to an English firm for \$25,000. The purchasers are the proprietors of the largest copper refining works in the world, located at Swansea, Wales, and have been purchasers of the entire product of the Canada Copper Company's mines hitherto. Mr. Andrew McCormack, of the same place, has refused ten thousand dollars for his nickel mine near Sudbury.

MESSRS. G. A. & H. S. FLETT, Nelson, N.B., are large manufacturers of brick. Their works at that place have a drying capacity of 250,000 bricks, and 500,000 bricks can be burned at one time in their kilns. They have recently acquired and now operate the extensive brickyard at Napan, near Chatham, N.B., owned by the Maritime Chemical Pulp Company, the capacity of which is about 22,000 bricks per day. They also own and operate an extensive brickyard at Bathurst, N.B., where they have turned out 175,000 bricks the current season.

THE John Doty Engine Company, Toronto, have contracted to build the two new ferry steamers for the Toronto Ferry Company, for service between the city and the Island. These steamers will each have a carrying capacity of 1,000 persons. They will be constructed of iron and are to be 140 feet in length by 40 feet in breadth. They will be finished in a most elaborate manner, with a handsome saloon on main deck 110 feet in length and 40 feet in breadth, brilliantly illuminated with incandescent lamps. These steamers will be completed by May next. They will be constructed at the Doty Company's works in Bathurst street.

MESSRS. A. A. BARTHELMES & Co., manufacturers of grand, square, and upright piano actions, whose factory is at 101 Niagara street, Toronto, are proprietors of an "infant industry" in Canada that promises to soon assume large proportions. Mr. Barthelmes and his partner, Mr. T. H. Eagen, began the manufacture of this line of goods in this city about two years ago; and being largely experienced in the business, turned out piano actions which were fully equal to any produced in the United States or Europe, and which have achieved for them a reputation on which they are building up a fine business. They now give employment to some twenty hands.

A wood pulp bath tub is being manufactured, for which the makers claim decided advantages over marble or porcelain. The tub requires no frame to set in, but is simply placed on the floor, like any other article of furniture and the pipes attached. It has the advantages of being movable, easy to keep clean, pipes are easy of access, and it will not chill water like stone or metal. The walls of a porcelain tub are always cold, and it takes a good deal of hot water to warm them completely in winter. This wood fibre tub is a new thing, and promises to please everybody. They are made in imitation of any grain of wood on the outside. The inside is finished in imitation of enamel.

THE Bancroft Iron Company, Toronto, has recently been organized with the object of erecting a blast furnace with capacity to produce 100,000 tons of pig iron a year. Before beginning the erection of this furnace the company are asking the Ontario Government to assist them in extending the Irondale, Bancroft and Ottawa Railway from Irondale, its present terminus, fifty miles to Bancroft, where the company own valuable iron ore beds. They also want a grant of wooded land from which to draw supplies of charcoal for the furnace. The road has already a subsidy from the Dominion Government of \$3,200 a mile, and the Ontario Government are asked an additional subsidy of \$3,000 a mile.

THE Orono Machine Works, at Orono, Ont., of which Messrs. James Leigh & Sons are proprietors, manufacture steam engines and boilers, stationary, portable and compound, condensers and marine engines, saw mill machinery, all sizes portable and stationary, shingle mill and flour mill machinery. Brass and other castings of every description furnished; shaftings of all sizes turned and finished, hangers and boxes all complete; inspirators of all sizes, and all brass goods required for engines and boilers. They also manufacture turbine water wheels, plows, and do repairing of every kind. This industry has been in operation twenty-two years, has good equipments and turns out excellent work.

THE Dominion Dyewood and Chemical Company, Toronto, have sent us the following notice, which explains itself: "We have pleasure in informing our customers that we have engaged the services

of Mr. Hans Lindner, of Elberfeld, Germany, as chemist and sample dyer. Mr. Lindner is thoroughly acquainted with the manufacture of aniline colors, as well as their use in dyeing, both practical and theoretical, and we are confident that our customers will appreciate this step on our part to advance the dyeing industry in Canada, in supplying our customers with latest information in the use of new aniline colors and alizarines, as well as practical information about dyeing with woods and extracts, which better enables them to compete with foreign goods.

MONDAY the gentlemen representing the American Wool Boot Co., were in the city, and the city council closed the contract which secures the location of their factory at Hastings. The city gives the site, two acres, builds the buildings and furnishes the engine, at an estimated cost of \$7,500, the property to remain in the city's name for five years, a nominal rental to be paid yearly, and a nominal sum for the deed at the expiration of five years. This is a Canadian company of which Mr. Edward Roos will be manager, has plenty of capital behind it, and the men from appearances and references are honourable, successful business men, and know the business well in which they are to engage. They will use 500,000 pounds of wool yearly, make 1,000 pairs of felt boots per day, and employ from 100 to 125 men.—Hastings, Mich., *Star*.

THE October report compiled by the Pittsburg, Pa., *American Manufacturer*, of the condition of blast furnaces in the United States, shows 313 in blast and 286 out of blast. The weekly tonnage of those in operation is 153,546, and of those idle 79,975. In the bituminous or coke furnaces in blast there is an increase in capacity of 11,463 tons since September 1st. As compared to the capacity of the furnaces in blast October 1st, 1888, there is an increase of 23,836 tons. This is due to the increased demand for Bessemer pig, which is now very active, and is quoted at \$21 cash, which is an advance of \$3 in two weeks. The fluctuations in the price of Bessemer pig have been considerable since the first of the year. On January 1st it was quoted at \$17, and it declined steadily until June, when it reached \$15.75, the lowest notch. Now it is held at \$21, and but few can be found who will accept orders at that price. The fluctuations in rails, blooms, billets and slabs have been in proportion.

THE Toronto Incandescent Electric Light Company are erecting a large and substantial building on Terauley street for a central station, which will be completed in the course of a few weeks. Meantime they are laying their electric conductors under ground on Yonge street and some others of the principal streets of the city, this being done out of deference to the prejudice against overhead wires, the Edison system being peculiarly suited for underground work, although the current is perfectly harmless under any conditions. The process of laying these conductors is an exceedingly simple one, several hundred feet being laid in a day, and the small trenches dug to receive them replaced without the slightest inconvenience to traffic. Arrangements are made for house connections at intervals of twenty feet, and it is understood that a large number of applications have already been made for the light. This is the beginning of a new enterprise by means of which it is intended that the whole city shall be supplied with the incandescent light without the necessity of overhead wires, many of which are a constant menace to life and property.

THE problems of ocean navigation which are being tested in the large ships which have recently been added to the Atlantic service, are gradually approaching nearer their solution. The large single screw ships of the Cunard line for a time held the first position, but the introduction of the system of double engines and twin screws has left them long behind. The present trial seems to be between the broad and beamy ships of the Inman line, with twin screws far apart, and the long, narrow ships of the White Star, with screws overlapping one another. The *City of Paris* leads the list, far ahead of all other competitors. Before the last trip of the White Star *Teutonic*, the propeller blades were shortened one foot each at Liverpool, and as a result her speed was increased by 47 minutes on the whole voyage, but not yet enough to bring her up to the speed of the *City of New York*, her nearest rival. To make this gain the smaller screws attained an average of 79 revolutions per minute instead of 70 revolutions as previously, and the consumption of fuel rose from 212 to 240 tons per day. It would seem as if the increased energy expended upon the water had not resulted in a corresponding addition to the speed. Most interesting developments in speed propulsion are being worked out.

MR. HENRY EDSALL, whose office is at 88 King street, east, Toronto, is general manager for the Dominion of Canada, of Messrs. E. H. Kellogg & Co., of New York, manufacturers of machinery oils. Messrs. Kellogg make the world renowned anti-corrosive cylinder, "Imperial" engine, and other fine grades of lubricating

oils. One of the secrets of the enormous growth of this business is the reputation of building upon fine goods; they have never desired to enter into competition with low grade inferior oils, which soon destroy and eventually entirely ruin machinery. They contain no acid or alkali to corrode, or grit to wear out the metal, but are lasting, cleanly, and promote smooth running in the highest degree. Wherever tried they frequently find preference to other oils, and thus testify to the thoroughly reliable and perfect methods of manufacturing, while the standard of excellence which gave to the house its business success has been steadily maintained throughout its lengthy period of experience. Another important branch of manufacture closely allied with their products, which is of great saving to their customers, and for which they have secured the exclusive control for the Dominion of Canada, Great Britain, its dependencies, and the entire Continent of Europe, is the well-known products of the Michigan Lubricator Company—sight feed lubricators, sight feed, index and plain oilers for all classes of machinery, etc.

A PROJECT is on foot in Montreal for establishing a joint stock company for the purpose of manufacturing boots, shoes, leggings, etc., in bond, on a large scale for export only. The company will be known as the Mullarky Boot and Shoe Company, limited. They claim that they will be able to import the bulk of the raw material required, saving the duty of 20 to 30 per cent., as a great deal of raw material required is imported now, and after paying the duties can be laid down here as cheap, and sometimes cheaper, than the goods manufactured in Canada can be bought for. The paid-up capital is to be \$100,000. It is calculated that a bonus of \$75,000 or its equivalent, which can be easily had from some city or town near Montreal, would pay for building and machinery in running order, leaving \$100,000 clear for working capital with which to do a business of \$500,000 the first year, at least at 6 per cent. net profit, or 30 per cent. on the capital. A dividend of 10 per cent is to be declared each year, adding \$20,000 per annum to the rest account, until it reaches \$100,000, when a division of the same in shares is to be made among the stockholders. The company will commence to manufacture as soon as it obtains its charter and has a suitable factory built, as it has been made an advantageous offer of dies, patterns, lasts, styles, etc., necessary to supply boots and shoes to Great Britain, and also a well established connection with the trade of that country.

At present electric welding machines in different parts of the country are being used in the following capacities: Axle welding, carriage gears, fifth wheels, twisted wire cables, welding safe ends of boilers, wagon tires, hoops for barrels; it is also used for joining wires of copper, iron, steel and German silver together in like metals and different combinations. Bars of metals may be joined at angles, as T or Y joints; welding eye rings to the end of bars; making rings of precious metals, uniting steel with iron in the manufacture of agricultural implements, tools, etc.; lengthening or shortening rods, bars, screws or bolts; welding of cast iron pieces in the general construction of machinery, such as frames, fittings, etc. Electric machines are also used in welding boiler plates and other



## MILITIA.

SEALED TENDERS, marked on the left hand corner of the envelope, "Tenders for Militia Store Supplies, and Necessaries," addressed to the Honorable the Minister of Militia and Defence, will be received up to noon of Monday, the 28th October, 1889.

Printed forms of tender, containing full particulars, may be obtained from the Department at Ottawa and at the following Militia Stores, where also sealed patterns of all articles may be seen, viz.:—The offices of the Superintendent of Stores at London, Toronto, Kingston, Montreal, Quebec, Halifax, N.S., and St. John, N.B.

The material of all articles will be required to be of Canadian manufacture and of Canadian workmanship, and no tender will be received unless made on printed forms furnished by the Department.

Each tender must be accompanied by an accepted Canadian bank cheque, for an amount equal to ten per cent. of the total value of the articles tendered for, which will be forfeited if the party making the tender declines to sign a contract when called upon to do so, or if he fails to complete the service contracted for. If the tender be not accepted, the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

A. BENOIT,  
Secretary,

Department of Militia and Defence.

Ottawa, 18th October, 1889.

sheet metal, and thereby replaces the ordinary method of riveting. The machines are suitable for clamping devices, for electric soldering, brazing, forging or bending of metals. Electricians are now experimenting on radiator and general brazing, and on riveting machines, which it is claimed will cause a complete revolution in the old methods of riveting, as by electricity the riveting can be done so as to avoid all leaking. One of the latest and most satisfactory developments has been that of welding chain. It is claimed that a great merit to the electrically welded chain links is that when subjected to a fracturing load the limb will break away from the weld, whereas when welded by ordinary processes it almost invariably breaks at the weld.

THE Hibbard Electric Manufacturing and Supply Company, whose head office is in Montreal, with branch office at Permanent Exhibition of Manufactures, 63 Front street west, Toronto, are meeting with much success with their warehouse telephones. These telephones are designed expressly for affording communication in factories, warehouses, hotels, etc., and is claimed to be the only system that ensures thorough connection between the different departments. No exchange is required, each instrument having its own switch board, and instant communication is at once procured with the instrument desired by turning the switch to the desired number. The chief advantages of this telephone are: The lines can be used by more than two persons at one time. For instance, with a system of nine instruments numbers one and three, two and eight, five and seven, four and nine can converse at the same time. Sometimes two persons may be talking, and may want to consult a third who is in some other part of the building. The latter may be called up and the three can converse together. Only the bell on the instrument that communication is desired with is rung, thereby precluding any possibility of the line being "tapped." These instruments are being used in many of the leading factories and warehouses throughout the country, giving great satisfaction. Some of the parties in Toronto using these Hibbard telephones are the Massey Manufacturing Company, Cobban Manufacturing Company, Kemp Manufacturing Company, Consumers' Gas Company, Messrs. John Macdonald & Co., American Rattan Company, Messrs. A. A. Allen & Co., and Messrs. James Robertson & Co.

THE two grain elevators at Montreal, belonging to the Canadian Pacific Railway Company, are 210 feet long, 80 feet wide, and 157

feet high. Each elevator is built upon eighty piers, each supported by a cluster of nine piles. The cost of the foundation alone was \$154,851. There are 100 bins in use, each one being fifty feet in depth, the inside bottom of each being lined with iron to prevent the plank from wearing away. The cupola, or central portion at the top of the elevator, is reduced to a width of forty-nine feet, so that it may have a solid bearing, and so not depend upon the shrinkage of the bin walls. The upper story of the cupola contains an immense amount of machinery. The shaft which carries the pulleys is six inches in diameter, made in sections. The belt inside the elevating shaft passes round a wheel twenty-four inches in diameter at the bottom, and the six feet diameter pulley on the main shaft at the top of the building. This belt travels at the rate of 569 feet per minute. In the centre of the building tracks are laid upon which the grain cars enter in order to be loaded or unloaded. When a car of grain is ready for unloading it is placed along side the grating through which the grain passes into the tank. The work of unloading is effected by large wooden shovels, which are attached to a rope connected and wound around a drum working automatically on a shaft fixed to the posts over the platform, which runs the whole length of the immense building. The shovel is placed in the car, the machinery set in motion, and gradually it scrapes the grain out to the grating and from there it falls to tanks beneath. At the bottom of the tank is a small hole through which it passes into buckets and is quickly elevated to the top of the building. Thirty thousand bushels of grain can in this way be placed in proper storage in one hour. Two spouts are used for loading cars, and the discharge is so great that a car of 600 bushels capacity can be filled in three minutes. The elevators combined are the largest in Canada, except perhaps the one built by the C.P.R. at Fort William. The system for prevention of fire is in every respect good. Barrels and buckets of water are placed all over the buildings, and pipes connected with the city waterworks, with hose attached, can be turned on and flood the buildings at any moment. The boiler house is sixty feet from the main building. Two engines of 170 and 240 horse power are required to drive the immense amount of machinery required to properly handle the grain. The arrangement for conveying grain to vessels is capital. The water's edge is about 150 feet from the side of the elevator, and about thirty feet from the ground is built a tunnel through which passes a belt upon which 12,000 bushels of grain can be carried in an hour.

# The Canadian Locomotive & Engine Co.

(LIMITED)

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## STATIONARY ENGINES

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DESCRIPTIVE CATALOGUES OF THE ABOVE ON APPLICATION.

ESTIMATES GIVEN FOR ALL DESCRIPTIONS OF MACHINERY.

THE RELIANCE ELECTRIC MFG. CO. (LTD.)

THE Reliance Electric Mfg. Co., of Waterford, Ont., furnished some fifty arc lights to the Industrial Exhibition for lighting the Annex, Natural History and other buildings. The lights of the Reliance system are perfectly steady and noiseless, and are remarkably pure and white.

The Reliance Company are overcrowded with work in their factory, and did not attempt to make any display beyond supplying the lights to the Association which they had contracted for. Their real display is to be found in the thirty odd towns where the Reliance system has been introduced during the past year. The company now have orders ahead sufficient to keep their factory working at its present capacity for the next four months. To overtake their large and growing business they are increasing their manufacturing facilities, and will shortly be in a position to fill all orders promptly.

To give some idea of the business this company are doing, we have only to say that they claim to have introduced their system into more towns and villages in Canada during the past year than all the other arc systems combined. Their aggregate sales since the last Industrial Exhibition were 1,325 arc lights. During that time the Reliance system, the company inform us, has replaced the "Royal," the "Ball," and the "American" systems, and today stands unrivalled for the following points, viz., economy of operation, economy of maintenance, simplicity of construction, purity and steadiness of light.

The Reliance Company have the honor of having introduced 1,000 candle power arc lights into Canada for street lighting purposes, while the town of Watford, Ont., has the distinction of being the first town in Canada whose streets were lit with 1,000 candle power arc lights.

In addition to their arc light system, the Reliance Electric Mfg. Co. have commenced the manufacture of an incandescent system of lighting and of storage batteries, which they claim are as far superior to others as is their arc system.

WEBSTER'S

"Vacuum" Exhaust Steam Economizer

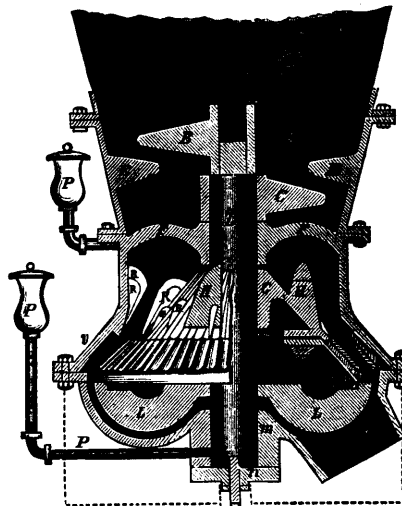
Is the Most Improved and Modern Appliance for the Economical Use of Exhaust Steam. Saves the Heat in Exhaust Steam which would otherwise go to Waste.

Utilizes the exhaust steam for heating buildings, etc., returning the condensation to boiler, and for making hot and purified water for boiler feeding and other purposes, and the combined advantages as enumerated in our pamphlet. Orders solicited on trial for acceptance.

We refer to the largest firms in the U. S. and Canada, who have adopted it and duplicated their orders after most exhaustive tests.

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SEGMENT BARK MILL.

For Grinding any hard substance  
SUCH AS

Cement, Plaster, Bones, Bats, Ores, Paint, etc. It is also used to grind Liquorice and Sarsaparilla roots. Also as a Corn Breaker.

The Segments will retain their cutting edges longer than those of any other Mill, and when dull can be quickly and cheaply renewed.

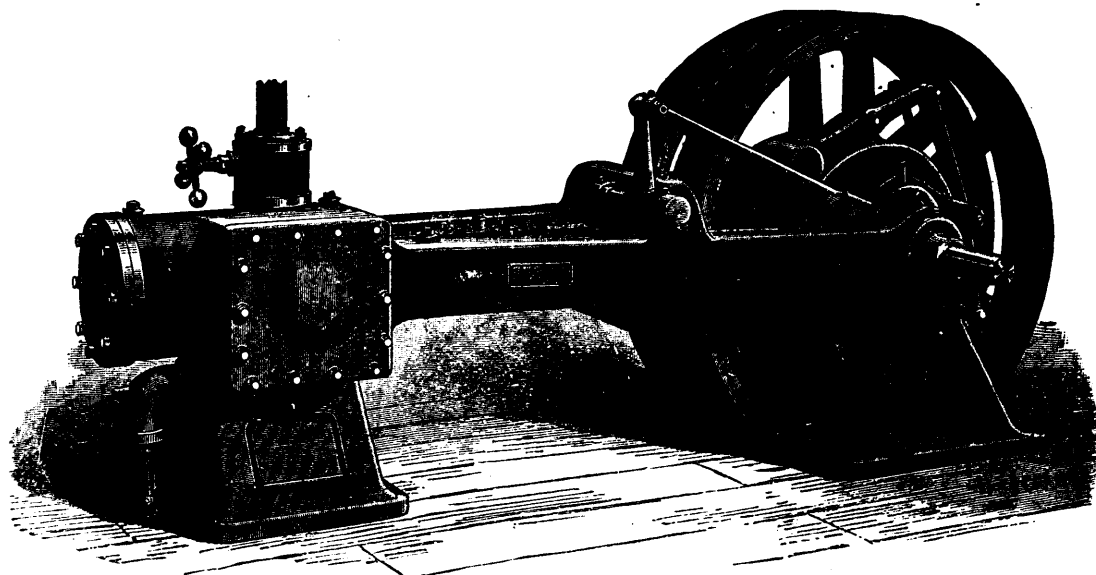
It has the following good qualities, viz.:—Fast grinding evenly prepared bark; is easily erected and small power required to drive it.

It works with ease in damp or frozen bark, and breakages are prevented by safety coupling.

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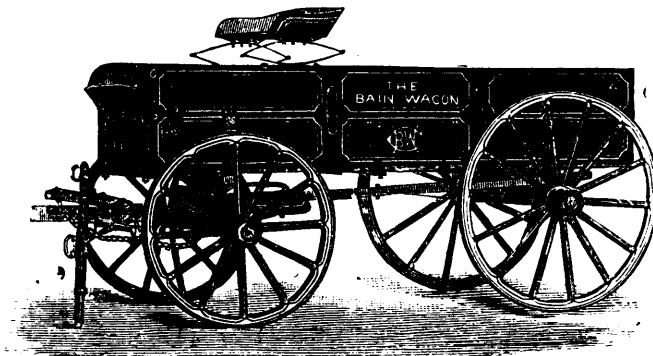
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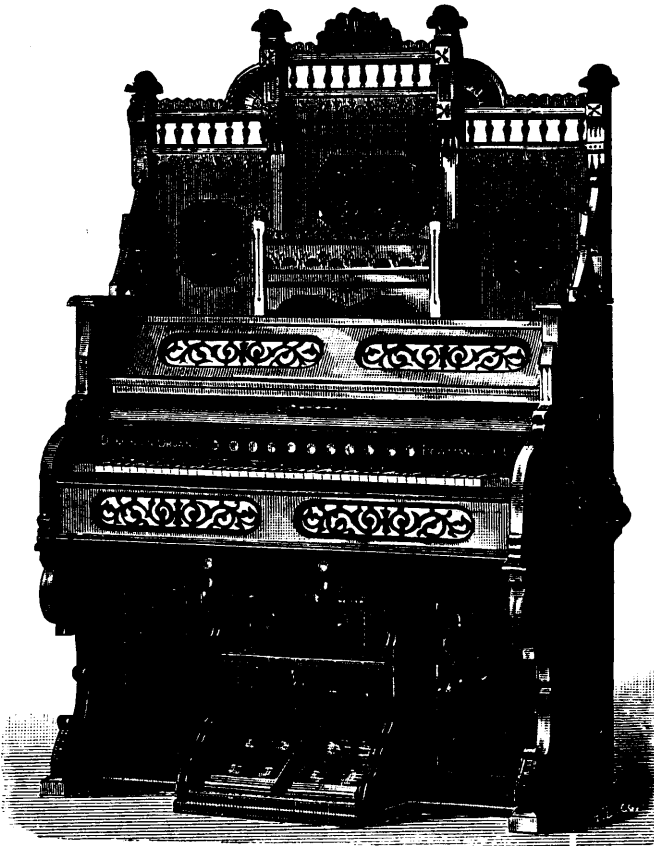
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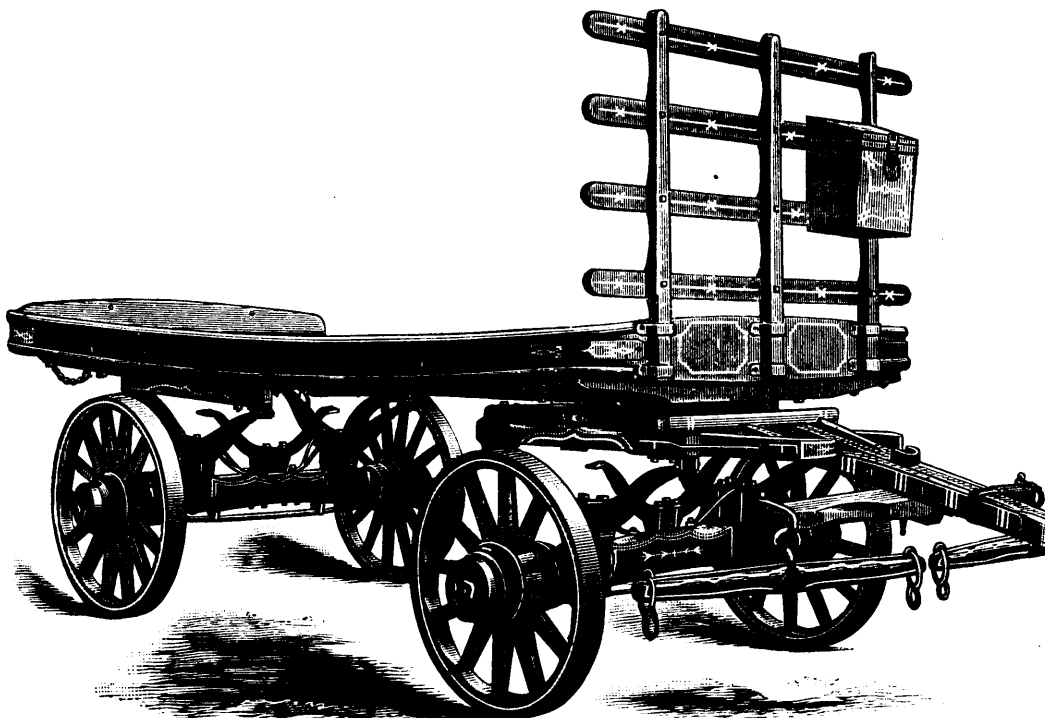
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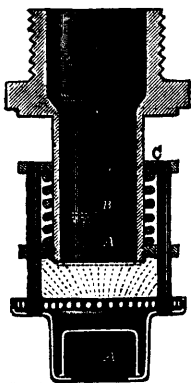
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As no agents are employed and the company deals only with the principals of the establishments insured by it, conditions and exceptions which are so apt to mislead the insured and promote controversy and litigation in the settlement of losses will thus be avoided.

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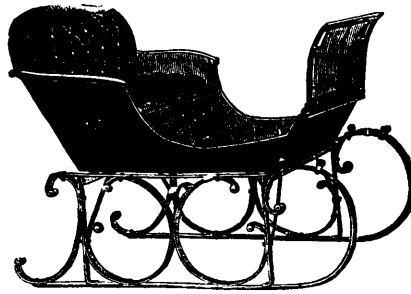
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Light, Stylish and Roomy. Three hard winters' test has doubly verified our claims regarding these gears in all respects. **Unbreakable** under almost any circumstances. **Easy Draft** in good or poor sleighing. Will stand, by actual test, **300 per cent. greater strain** than raw steel, or iron and wood combination, and **draw one-half easier**, and **Runners wear six times longer**. Every carriage maker should handle them. Send for descriptive circulars and reduced prices to the trade.

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Guelph, - Canada.

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**TO RENT.**

The Flats and Basement of that centrally situated property on Bay Street, below Front Street, being the **BEST BUSINESS PREMISES** and location in the City of Toronto, **WITH POWER** (guaranteed steady), Steam Heating, W. C., Wash-rooms, etc., on each floor. Heavy Weight Steam Hoist; good light on three sides; Lowest Insurance Rates; entrance from front or rear to each flat. Specially adapted for Factory, Warehouse and Office purposes.

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We have also in the same locality, Lot 70 feet front by 100 feet deep to a lane, on which we will erect factory buildings specially to suit a good tenant. For further particulars apply to

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THEO. H. EATON & SON, Windsor, Ont.; Detroit, U.S.A.—Importers of every Description **Pure Aniline Dyes** for Cotton and Woolen Manufacturers. **Dyed Samples** furnished on application. Address all correspondence to Head Office, Detroit, Mich.

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DOMINION BRIDGE CO. (Limited),—Shops at Toronto, Ontario, and Lachine, Quebec. Builders of Steel and Iron Railway and Highway Bridges.

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MAKE A SPECIALTY OF  
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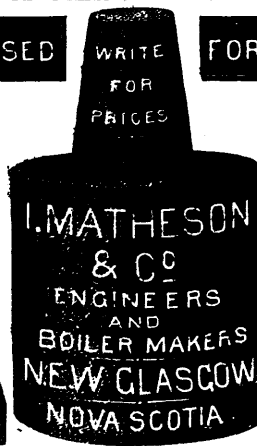
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ALSO MANUFACTURERS OF GENERAL WIRE WORK. Window Guards, Stable Fixtures, RAILINGS. Sand Screens, Coal Screens, Etc.

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**WIRE CLOTH**

**ALL GRADES**

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**PERFORATED SHEET METALS**

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# G. & J. BROWN M'F'G CO.

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Engineers, Machinists, Boiler Makers,

Foundrymen and Bridge Builders.

RAILWAY and CONTRACTORS' SUPPLIES A SPECIALTY.

Frogs, Diamond Crossings, Switches, Hand Cars, Lorries, Velocipede Cars, Jim Crows, Trach Drills, Semaphores, Rail Cars, Double and Single Drum Hoists, etc., etc.

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This property has a frontage of 133 feet on the Esplanade immediately east of Sherbourne Street, by a depth of over 700 feet to the new Windmill line in Toronto Bay.

On the property is erected a brick factory, four storeys high, and about 102 feet by 131 feet with 20-inch walls, having a capacity of between 600 and 700 bushels of corn per diem, which could be readily increased at a comparatively small cost to 1,500 bushels per day. The plant and machinery is of the most improved description, and is in thorough working order. The facilities for shipping from this property by boat and rail cannot be surpassed.

The property will be sold with or without the machinery.

THE ABOVE PROPERTY WILL BE OFFERED

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For terms apply to the auctioneers, Oliver, Coate & Co., or to Beatty Chadwick, Blackstock & Galt, 58 Wellington Street East, or to Wm. Reford & Co., 88 Church Street, Toronto.

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ALL KINDS MADE TO ORDER.

HIGHEST QUALITY OF WORK GUARANTEED.

SEND FULL PARTICULARS OF DIMENSIONS AND QUALITY WHEN ORDERING.

Old Rollers or Blocks Re-filled with Special Care.

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FOR FURTHER PARTICULARS APPLY TO

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(Which are an Excellent Substitute for the Real Article.)

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Everyone interested in the Buffalo should see the Fur Cloth that we are manufacturing for the coming winter, and which is used for

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Messrs. W. H. STOREY & SON have the exclusive sale for Canada.

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GALT, ONTARIO.

GALT, 4th September, 1889.

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RAILWAY CAR WORKS, | PORTLAND ROLLING MILLS,  
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Railway Cars of all descriptions. Chilled Car Wheels, "Washburn Peerless" Steel Car Wheels. Car, Machine, Mill, Ship, and all kinds of Castings. Steam Engines, Mill and other Machinery. Nail-Plate, Bar Iron, Street and Mine Rails, Ships' Iron Knees, Hammered Car Axles, Shafting and Shapes.

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REDUCED PREMIUMS ON FIRE INSURANCE  
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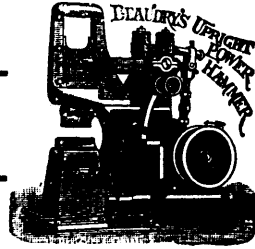
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IMPORTANT TO MANUFACTURING FIRMS.

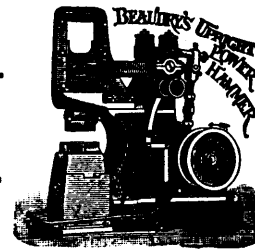
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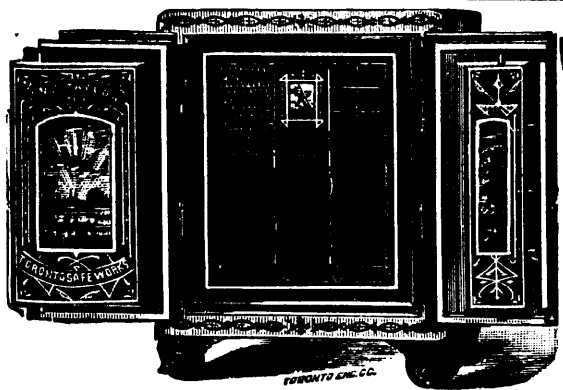


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The most handy, compact, and above all, the most efficient tool ever invented for Manufacturers of all descriptions, Railroad Shops, Steel and Machine Forgers, File and Vice Makers, Knife and Cutlery Makers, Axle, Edge Tool and Agricultural Implement Manufacturers, Carriage Builders and, in fact, all others who need a first-class Hammer, and one of extraordinary capacity and adaptability. Correspondence solicited. Can be seen at Permanent Exhibition, Toronto.

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Double Tongue  
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FIRE-PROOF

**SAFES**

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Established 33 years.

All our new style Fire-proof Safes are fitted with **TWO COMPLETE TONGUES AND TWO GROOVES** on both the door and door frames, which effectually prevent the heat from passing between the door and frame into the interior of the safe.

They are also fitted with **CHILLED CHROME STEEL PLATES** under the Lock and Bolt Spindles to prevent drilling; and have **DRY AIR-CHAMBER** inside to prevent dampness to papers.

Catalogues and Prices on application.

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The direct route between the West and all points on the Lower St. Lawrence and Baie des Chaleurs, Province of Quebec; also for New Brunswick, Nova Scotia, Prince Edward, Cape Breton, and the Magdalene Islands, Newfoundland and St. Pierre.

Express trains leave Montreal and Halifax daily (Sunday excepted) and run through without change between these points in 30 hours.

The through express train cars of the Intercolonial Railway are brilliantly lighted by electricity and heated by steam from the locomotive.

New and elegant Buffet sleeping and day cars are run on all through express trains.

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Passengers for Great Britain or the Continent, leaving Montreal on Thursday morning, will join outward Mail Steamer at Rimouski the same evening.

The attention of shippers is directed to the superior facilities offered by this route for the transport of flour and general merchandise intended for the Eastern Provinces and Newfoundland; also for shipments of grain and produce intended for the European market.

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And all other Varieties of

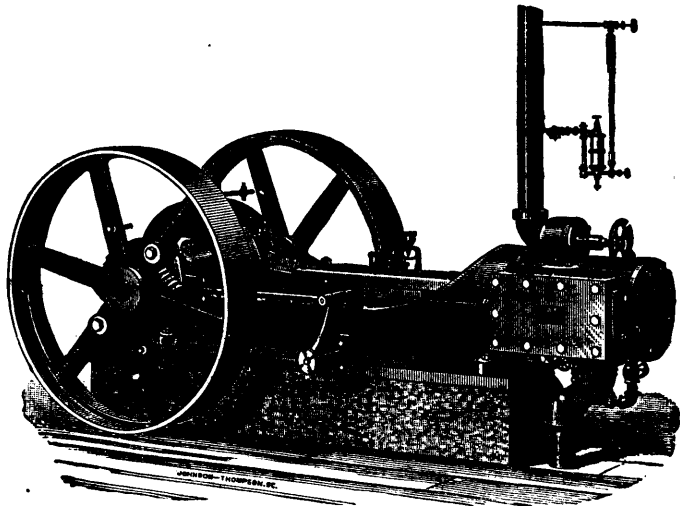
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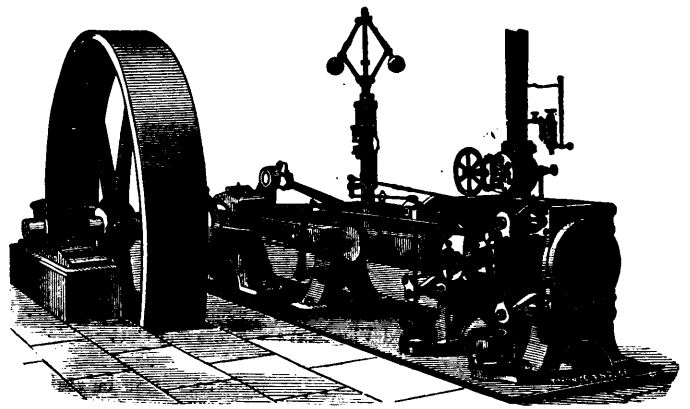
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**JUNCTION OF CRAIG AND ST. ANTOINE STS.**

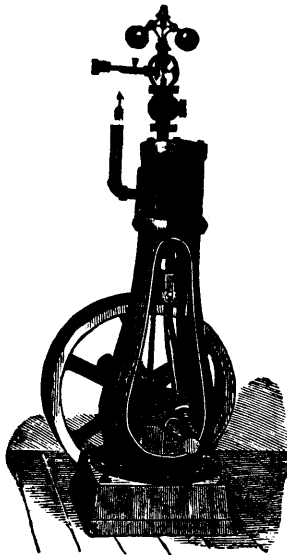
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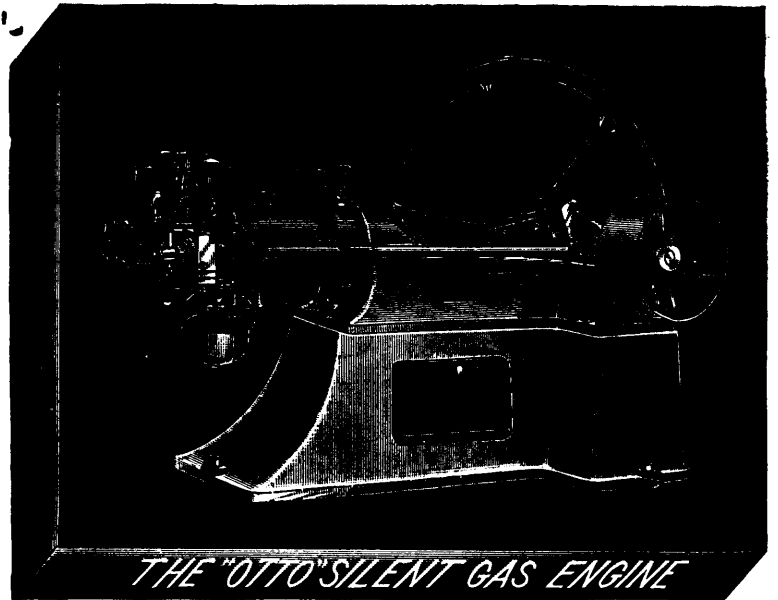
Armstrong & Sims Electric Light Engines.



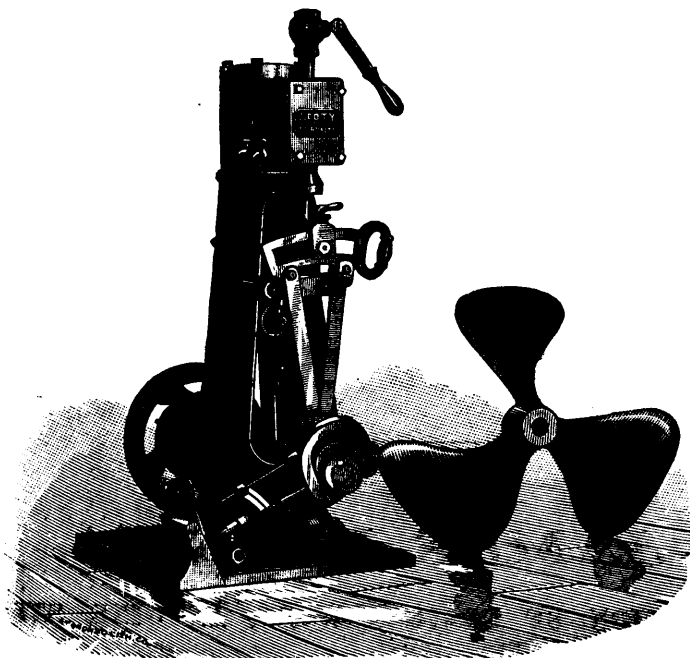
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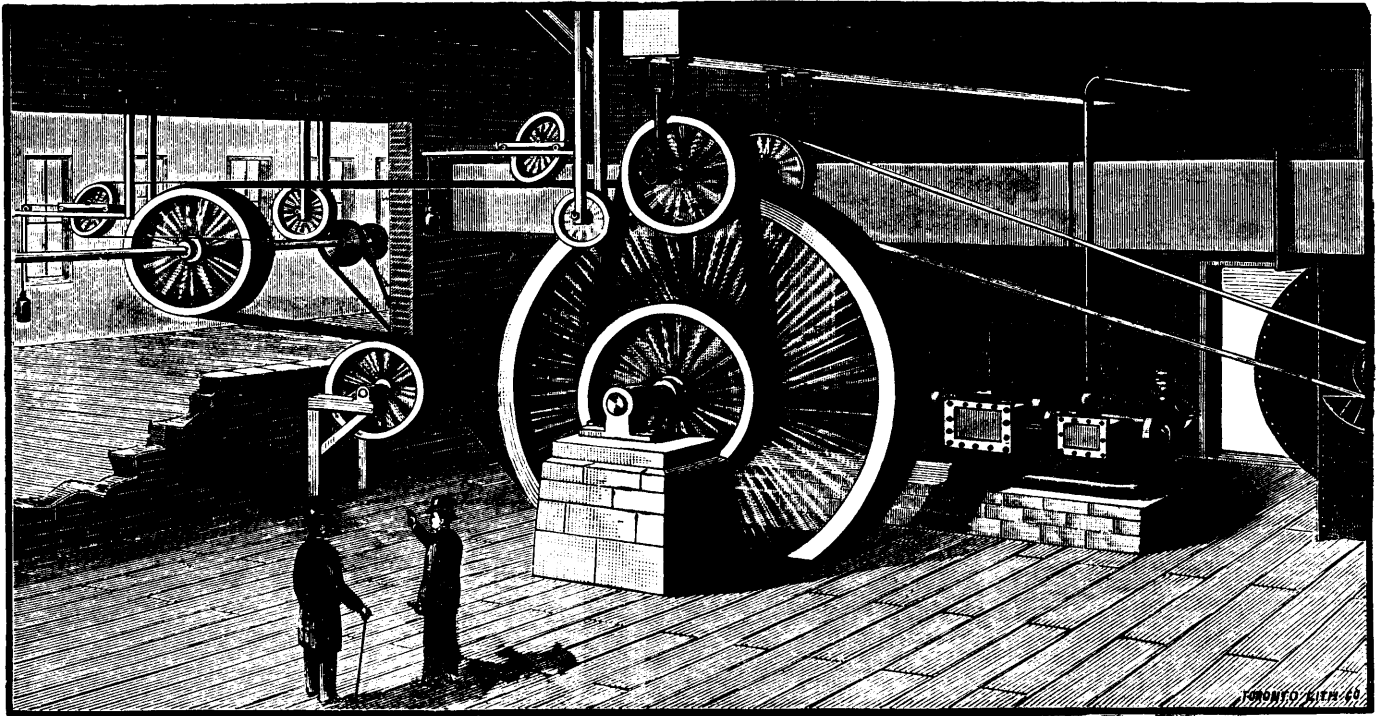
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## Transmission of Power



As in Use at the Works of the Dodge Wood Split Pulley Company, Toronto.

In this transmission the engine has two driving pulleys. The small one is 72 inches in diameter with eight ropes, which drives the large Sturtevant blower seen on the right. The large pulley is 153 inches in diameter, with rim of hard maple, grooved to carry eleven wraps of  $\frac{5}{8}$ -inch tallow-laid Manila rope, the connection being with a 63-inch grooved wood pulley on  $3\frac{1}{2}$ -inch main shaft, 250 feet long, from which is transmitted power to all the machinery in the main building. The engine is 100 horse-power; the travel of the rope is 5,000 feet per minute; the length of the rope is 1,280 feet, and the weight 180 pounds, the cost of which, at 16 cents per pound, is \$28.80. A good leather belt, equal to the same service, would cost \$224.00. The pull on the rope when transmitting this 100 horse-power is only  $1\frac{1}{2}$  per cent. of its breaking strain, while it is perfectly safe to use 10 per cent.

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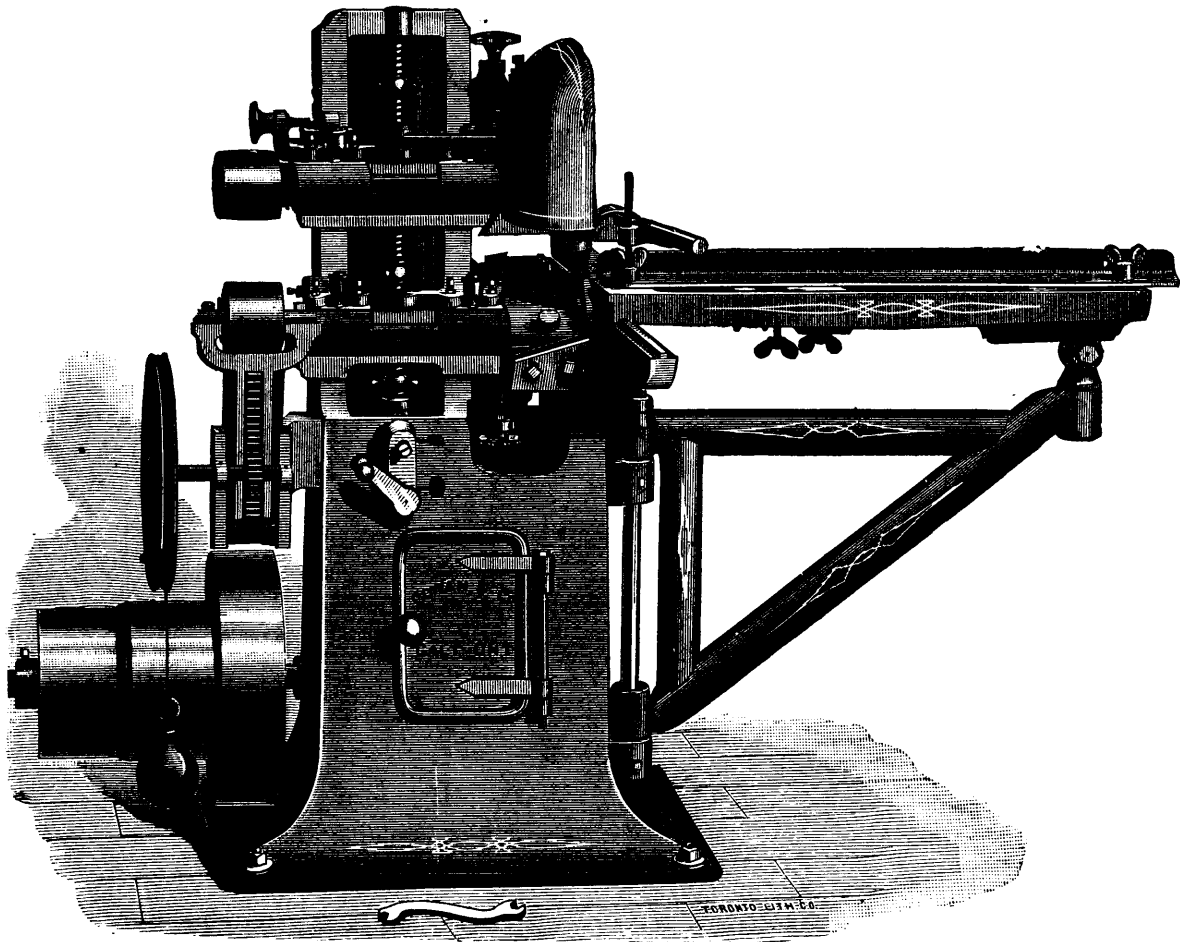
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P. O. BOX 333.

TELEPHONE 2080.



NEW AND IMPROVED  
*Pedestal Tenon Machine.*



This is an entirely new style of Tenon Machine. The frame is cast in one piece, and the working parts stand solidly on a pedestal, avoiding vibration.

The Cutter and Cope Heads are connected and are moved all together, or separately, as required. The Upper Head and Boxes also adjust horizontally to suit shoulder of tenon, the Cope Knives moving with the Heads to prevent re-adjustment.

A special feature in this machine is the Bed, or Carriage, which is at once light and strong. The outer end works on rollers and is moved very easily.

In cutting the tenon the Bed and Carriage move entirely past the Heads and Cutters, the operator having full control of the work. It has also the advantage of leaving the Heads and Cope Knives clear, and of ready access by the operator.

The Carriage is so arranged that it cannot tip over the Slides nor be thrown into the Cutters, and is also supplied with extension bar for long stuff, as in all Tenoning Machines.

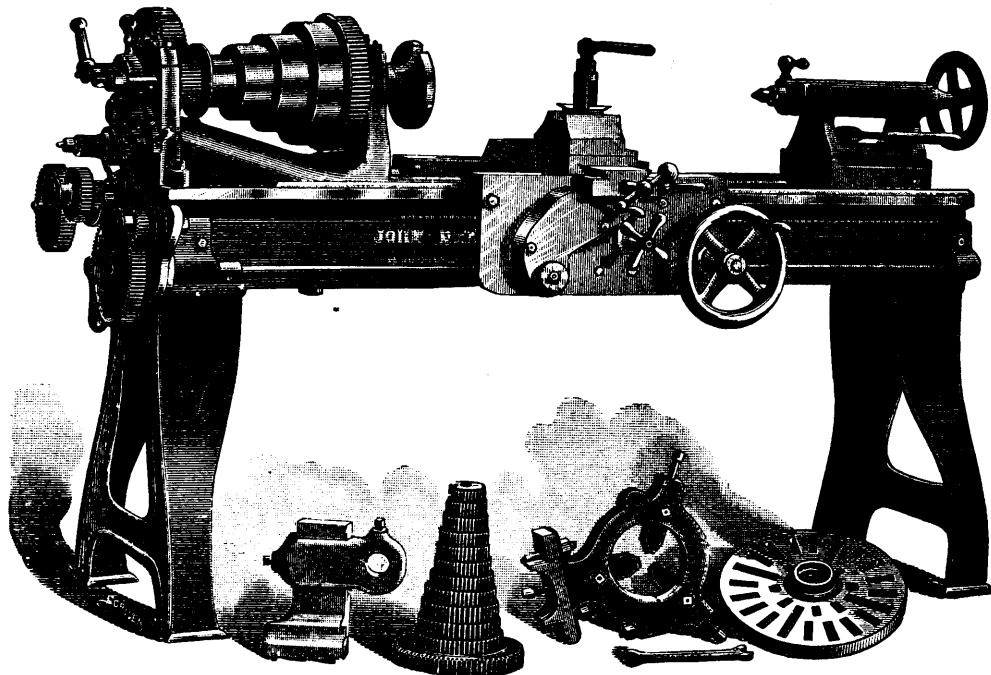
This Machine is supplied with single or double Copes, as ordered, and for furniture work it is without Copes, and with an adjustable cut-off Saw.

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**"Galt Foundry" Engine and Machine Works, GALT, ONTARIO, CANADA.**

*Curtiss and Slide Valve Engines, Boilers, and Wood-Working Machinery, all kinds, New Patterns, Highly Finished.*

Canada Tool Works, **JOHN BERTRAM & SONS** DUNDAS, ONT.



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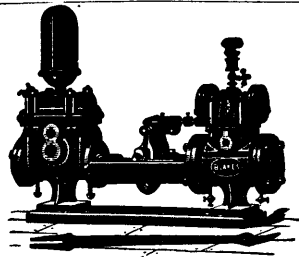
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MOULDERS,  
TENONERS  
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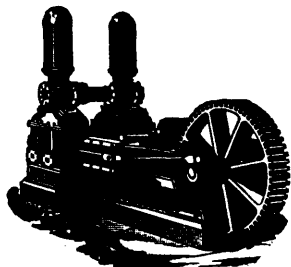
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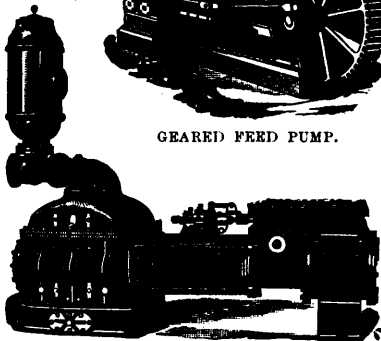
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BOILER FEED PUMP.



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DUPLEX COMPOUND ENGINE

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Steam and Power

Pumping Machinery



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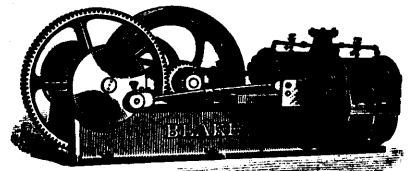
NEW YORK,

95 & 97 LIBERTY STREET.

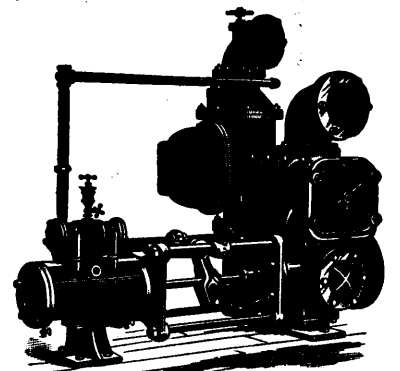


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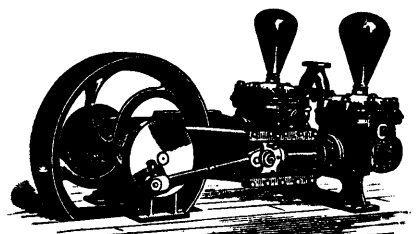
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AIR COMPRESSOR.



AIR PUMP AND CONDENSOR.



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# *Nova Scotia Steel Co., Limited,*

NEW GLASGOW, NOVA SCOTIA

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MANUFACTURERS OF

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MADE BY THE

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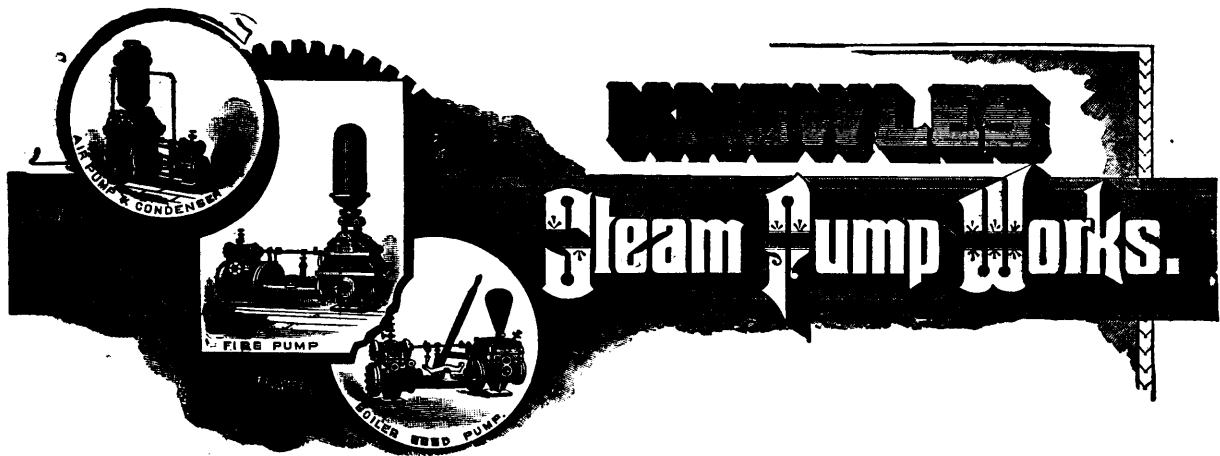
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STEEL MOWER BARS.

Particular attention given to the manufacture of Rake, Cultivator and Harrow Teeth, and other  
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**WHERE MANY SIZES MAY BE SEEN IN STOCK.**

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**GRAND,  
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PLANING MACHINE  
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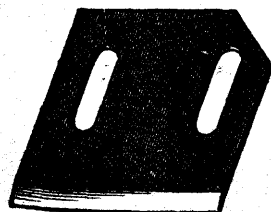
STAVE CUTTER KNIVES.



STAVE JOINTER KNIVES.



MOULDING, TENONING,  
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Cheese-box and Veneer, Paper Cutting, Leather Splitting and any special knife made  
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With fewer men, in less time, and easier than by any other  
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Approved by Underwriters, Owners, Masters and Builders.

**SOLE MAKERS FOR CANADA.**

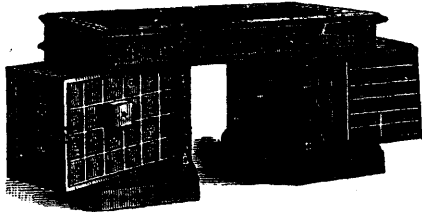
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WINDSOR, NOVA SCOTIA.

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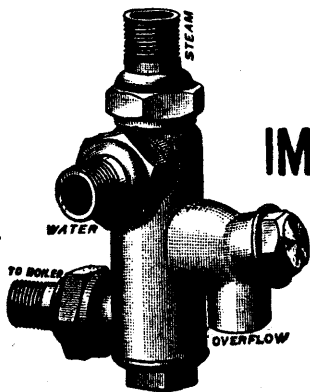
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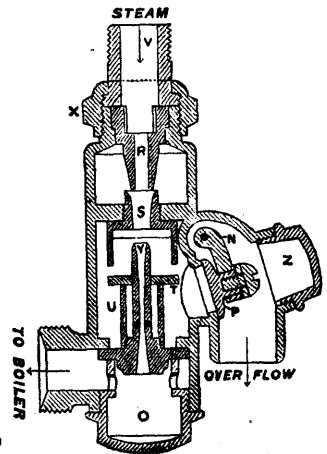


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