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CANADIAN MANUFACTURER AND INDUSTRIAL WORLD

DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

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MUNICIPAL PROTECTION FOR MANUFACTURERS.

AN anomalous condition of things prevail at Galt, Ont. A few weeks ago the moulders in that town went out on strike because the proprietors of the foundries declined to allow them to run their business. It was not a question of fewer hours of labor, or of more or less average wages; but the desire of the strikers seemed to be that workmen should be paid not less than minimum wages, whether they were worth it or not; while the proprietors declined to pay any man more than he was actually worth. It is conceded that the aggregate amount of wages previously paid the moulders, and the aggregate amount that would be paid to them under their present claim, would not materially differ; but the strikers insist that whether a workman is really worth it or not, his wages shall not be less than the minimum rate; while the proprietors say that their standard is and shall be regulated by the efficiency of the workman—good work, good pay; poor work, poor pay. Many of these striking workmen own the homes in which they live, and are identified thereby with the prosperity of their town; and it is to be regretted that such an unfortunate affair should have occurred as that which has brought almost to a standstill so many of the large industrial establishments there for which Galt is so justly celebrated.

No one denies to these workmen the right to work or not to work, or the right to fix the rate of wages at which they will work. They even have the right to say that they will not work unless the most worthless of their number receive as much wages as the most efficient. But when these concessions are made, it should be remembered that the proprietors of the Galt foundries also possess rights which even striking moulders should be made to respect. It is true that to the workingman his labor is his capital; and it may be true that some of these Galt strikers, through the increment of their capital, have acquired valuable real estate there; and that both this capital and this real estate should receive every necessary municipal protection goes without saying. So, too, should the capital of the Galt foundrymen be protected, but is it? The papers tell us from day to day about the efforts that these foundrymen are making to keep their works in operation by the importation of moulders from other places, and about the successful efforts these strikers use to prevent outside workmen from coming in, or to get them to refuse to go to work when they get there. Walking deiegates patrol the streets and infest the railway depots with the avowed intention of keeping Galt foundries in idleness unless the labor unions are allowed to have their way; and, strange as it may appear, there are hundreds of people in Galt who take sides with and encourage these unlawful demonstrations, and are delighted with a result that throws hundreds of workmen out of employment, thereby cutting off their source of income for the support of their families; and plunging into stillness and idleness the busy hum of industrial establishments which have won for their town the reputation of being one of the most prosperous in Canada.

There seems to be no way by which this unfortunate situation may be changed. The arrival in Galt of outside workmen for these beleaguered foundries creates intense excitement, not alone among the striking moulders, but among all classes; and the press dispatches tell us that on these occasions the fever of excitement rises to such an extent that the streets are rendered almost impassable by the crowds of strikers and their sympathisers, bent on intimidating the strangers and driving them from the place. The authorities, too, or some of them, are so much in sympathy with the strikers as to preside at indignation meetings, called to denounce the action of the foundrymen in daring to attempt to bring in outside workmen.

Concurrent with this strike and the incidents connected with it, it is to be noticed that the municipal authorities of the town of Galt have been making strong efforts to induce a certain manufacturing concern, who were seeking a location, to accept valuable inducements which they offered to establish their factory there. They will offer similar inducements to any manufacturing concern seeking a location; and a vigorous rivalry exists between about every incorporated town and village in Canada to induce manufacturers to accept bonuses and other favors from them, to locate their factories within their boundaries. But manufacturers who have money to invest might well ask what protection they are to receive from these towns where even the officials preside at indignation meetings called to denounce those of their kind who are not willing to surrender the management of their business into the hands of irresponsible labor unions. It is one thing to induce manufacturers to locate in a town—to expend large sums of money in erecting buildings, placing machinery and creating a business hum where silence otherwise would reign; but it is quite another thing, particularly to the investors, to find the town under the rule of mob law and their interests ignored and trampled under foot, as is the case at this time in Galt.

CANADIAN INLAND WATERCOURSES.

AN official statement is published of the traffic of the Sault Ste. Marie Ship Canal for the fiscal year ending June 30th, showing that the enormous tonnage passing through the gate-

way of Lake Superior constantly gains in magnitude. This statement is as follows:

Number of vessels	8,832
Number of lockages	4,390
Registered tonnage	6 213,494
Freight tonnage	6,932,203
Total time locks in operation, hours	3,012
Averages of lockages, minutes	4

The merchandise transported includes copper 30,261 tons; iron ore, 3,414,859 tons; coal, 1,854,527 tons; flour, 2,157,973 barrels; wheat, 13,084,417 bushels; other grain, 2,117,604 bushels; salt, 207,000 barrels. The classification of vessels is as follows, compared for two years:

	1889.	1888.
Propellers	6,002	5,632
Sails	2,319	2,330
Unregistered	511	861
Total	8,832	8,823

This table shows that small craft are being displaced by vessels of a larger tonnage, chiefly propellers. Freight tonnage in 1889 was 6,932,203, as against 5,531,169 in 1888. The registered tonnage was 6,213,494 in 1889, as against 4,741,176 last year, an increase of 1,086,514 tons.

According to the Dominion Statistical Abstract, the total revenue of Canada from all sources from our various canal systems amounted in 1888 to $351,193, as compared with $353,110 in 1887, showing a decrease of $1,917. The system of inland navigation in Canada is the largest and most important in the world. The St. Lawrence system alone, in conjunction with the great lakes, extends for 2,260 miles, viz., from the Straits of Belle Isle to Port Arthur, at the head of Lake Superior. Of this distance 71 miles are artificial navigation by means of canals, and 2,189 miles open navigation, and from Port Arthur to Duluth, which is the principal port in that section of the United States for the produce of the Western States, is a further distance of 124 miles, making altogether 2,384 miles. When it is considered that, by this means, unbroken water communication is afforded from Port Arthur and Duluth to Liverpool, a total distance of 4,618 miles, the importance of this system and the neeessity for its thorough maintenance will be at once understood. The arrival at Chicago on the 29th of June, 1888, of the steamer *Rosedale*, with clearance papers from London, naturally excited considerable interest, as it not only proved to Americans the possibility of sending grain direct from Chicago elevators to Liverpool without transhipment, but also proved to Canadians a like possibility of sending the products of the North-West direct from the elevators of Port Arthur. The passage occupied thirty five days, and the steamer was the first one that ever traversed the direct route from London to Chicago. Lake Superior and Lake Huron are connected by the Ste. Marie river, which is not capable of navigation owing to the numerous rapids. This difficulty was overcome through the construction of a canal on the United States side of the river, which is rather more than one mile in length, and has a lock 515 feet long and 80 feet wide, with a rise of about 18 feet. Traffic through this canal has, however, increased to such an extent that the Dominion Government are proceeding to build a canal on the Canadian side, and through Canadian territory. It will be about two thirds of a mile in length, have a mean width of 150 feet and a depth of 18 feet below the lowest water line. There will be one lock 600 feet long and 85 feet wide, with a rise of about 18 feet. The contracts for the work are let, and require the whole undertaking to be ready for use in May, 1892.

The other canal systems of the country are as follows: The Ottawa, which connects Montreal and the Rideau. The last-named canal was originally built by the Imperial Government for military purposes. The Richelieu and Lake Champlain system, or Chambly canal, extends from the junction of the rivers St. Lawrence and Richelieu, 46 miles below Montreal, into Lake Champlain, a distance of 81 miles. There are ten locks and a rise of 19 feet. By the Lake Champlain canal communication is obtained with the Hudson river and thence to New York city, to which place from the boundary line is a distance of 330 miles. The Burlington Bay canal, half a mile in length, connects Burlington Bay and Lake Ontario, giving access to the port of Hamilton. There are no locks on this canal. St. Peter's canal, Cape Breton, gives access from the Atlantic to the Bras d'Or lakes. It is 2,400 feet long, and has one tidal lock. The rise and fall of the tide is four feet. The Trent river system is only efficient for local use. The scheme of making use of these waters to effect a system of through water communication between Lakes Huron and Ontario has been in contemplation for many years, but up to the present time only certain sections have been made navigable, or fit for the passage of timber. The total distance between the lakes is 235 miles, and about 155 miles of this are available for light draft vessels. The Murray Canal has been built through the Isthmus of Murray, giving connection westward between the Bay of Quinte and Lake Ontario. It is four and one-half miles in length, and has no locks. The total amount spent on canals by the Imperial Government previous to Confederation was $4,173,921, and by the Provincial Governments $16,028,840. At the time of Confederation all the systems became the property of the Dominion Government, who have expended the further sum of $32,226,002, making a total amount spent for construction and enlargement alone of $52,428,764, the amount expended for repairs not being included in these figures.

COPPER IN BRITISH COLUMBIA.

Discussing the existence of valuable deposits of copper ore in British Columbia, the Victoria *Standard* says that copper ores were among the first in that province to attract notice at several localities on the coast, and during the early years of the province, various irregular and uncertain attempts were made to open up copper mines, but none of these resulted advantageously to the promoters, and no copper mining has yet been initiated in British Columbia. Dr. Dawson says that copper ores in smaller quantity are frequently found in little veins and joints in the altered volcanic rocks of the Vancouver series, extensively developed on the coast, as well as in the similar rocks of the interior of the province. Hundreds of such localities have been observed, but only a small proportion of these can be considered at all promising. Such occurrences, however, should receive the attention of the prospector, where met with, as the copper staining of rock exposures is sometimes the most obvious indication of the presence of ores of the precious metals.

It is further impossible to draw a distinct line between deposits which are to be regarded as ores of copper, and those which hold sufficient gold or silver to entitle them to be classed as ores of the precious metals. Thus the Toad Mountain ores, though owing most of their value to silver, contain, in specimens assayed, from 25 to 47 per cent. of copper. The ores of Jubilee Mountain, on the upper Columbia Valley, are very rich in copper, and some of them in which the percentage of silver is low, must be regarded as copper ores. Copper pyrites also occur in some quantity in the Stump Lake ores and in those of several other places previously described. A deposit of copper pyrites which appears to be of importance, is that owned by the British Columbia Copper Mining Company on the upper part of the South Similkameen. Another discovery of grey copper ore, reported to be extensive, has lately been made between Rock and Boundary creeks.

In the vicinity of the coast the most important copper deposit is situated near the head of Salmon Arm of Jarvis Inlet, and between that inlet and Howe Sound. The ore is chiefly bornite or purple copper, and the deposit is not far from the coast, but at an elevation of 3000 feet above sea-level. It was discovered about 1874, and was worked at intervals between 1877-83, though rather with the view of developing the property than for the actual extraction of ore for shipment. Three levels have been driven on veins which are reported to be from 2 feet 6 inches to 3 feet 6 inches in width. Assays have shown 58 per cent. of copper and 50 ounces of silver to the ton. An assay of an average specimen in the laboratory of the Geographical Survey showed 40 per cent. of copper. The veins traverse granite rocks like those generally met with in the coast ranges.

A deposit of copper pyrites, mixed with iron pyrites, was discovered near Sooke in 1864. The copper occurs in the native state, as thin leaves quite apparent to the eye, traversing green chloritic or diabase rock. A specimen subjected to assay. however, proved to contain but 1.02 per cent. of copper.

Masses of native copper have been found from time to time in various parts of the province, and nuggets and scales of the same material have been obtained in sluice boxes in the course of gold mining in a number of places, occasionally in notable quantity.

THE CANADA ATLANTIC CABLE.

THE proposed sub-Atlantic telegraph cable between Canada and Great Britain is exciting considerable attention on both sides of the water. Speaking of this cable, Mr. Gisborne, Superintendent of the Canadian Government telegraph service, who has recently investigated the matter, says that the route, via the straits of Belle Isle, will be 1,900 nautical miles in length, and will be 150 miles northward of any trans-Atlantic cable now laid, in addition to which the depth of the ocean will be considerably less, and the cable will be free from all risks during the repairs of other cables. The cable company would have only to provide and maintain the main cable or cables of not exceeding 1,900 miles in length, the connection eastward being with the Imperial Government post-office telegraph service, and westward with the Canadian Government telegraph service at Greenly Island, in the straits of Belle Isle. Hence the company would be at no outlay of capital for terminal cables, and no pooling pressure would be practicable. As one of the principal cable manufacturing companies in London have tendered to provide, lay and guarantee a cable of the most approved type for a million and a half dollars, the company's line will cost only one-fifth of the Anglo-American, one-quarter of the Direct United States Compagnie Francaise and Western Union, and a little over one-third of the Commercial Company's cables. At the same time its annual maintenance charges will be moderate, and the success of the Canada cable should be fully assured. A large amount of the capital, says Mr. Gisborne, has been subscribed, and there is not the slightest doubt that the cable will be laid next year. The bulk of the capital subscribed has been raised in Canada, and has been taken in amounts of from £1,000 to £5,000. The arrangements are so made that the Government will retain absolute control.

The Anglo-American Company have four cables in use as follows: between Ireland and Newfoundland, via St. Pierre and Cape Breton, laid in 1873, 2,174 nautical miles; Ireland and Newfoundland, via Sidney, C. B., laid in 1874, 2,183 miles; Ireland and Newfoundland, via St. Pierre and Cape Breton, laid in 1880, 2,246 miles, and between France and St. Pierre, and from St. Pierre to Massachusetts, laid in 1869, 3,407 miles. The direct United States Company's cables, between Ireland and Nova Scotia, to New Hampshire, laid in 1874, is 2,983 nautical miles in length; that of Compagnie Francaise *de* Paris *a* New York, from France via St. Pierre to Massachusetts, laid in 1879, is 3,257 miles long; the Western Union Company's cables between England and Nova Scotia are, that laid in 1881, 2,531 miles long, and that laid in 1882, 2,576 miles long; and the Commercial Company's cable, between Ireland and New York, via Nova Scotia, laid in 1884, is 3,191 miles long. The proposed Canadian cable, which will probably be laid next year, via the straits of Belle Isle to Ireland, will be but 1,900 miles long.

The representative expenditure or share capital of the foregoing companies is approximately as follows:

Anglo-American	$35,000,000	Each	line	$8,750,000
Direct United States	6,400,000	"	"	6,400,000
Compagnie Francaise	8,400,000	"	"	8,400,000
Western Union	14,000,000	"	"	7,000,000
Commercial	8,000,000	"	"	4,000,000
Canada Atlantic	1,600,000	"	"	1,600,000

IRON PRODUCTION OF THE SOUTH.

THE production of pig iron in what is now known as the nine iron States of the American Union for the first six months of the current year, as compared with the corresponding period of last year, is as follows:—

STATES.	First half of 1888. Tons.	First half of 1889. Tons.
Maryland	6,250	10,233
Virginia	92,495	112,328
North Carolina	1,100	922
Georgia	23,658	11,388
Alabama	169,696	364,346
Texas	2,968	1,411
West Virginia	45,601	72,775
Kentucky	21,267	23,865
Tennessee	122,817	147,401
Total for Southern States	485,852	744,669
Rest of Country	2,363,280	2,996,651

INCREASE.	Tons.	Per cent.
Increase of production for Southern States over same period of 1888	258,767	53
Increase in production for rest of country over same period of 1880	366,029	12

It will be noted that Alabama more than doubled its production of last year—or to be exact, increased it 114 per cent. The fact should be taken into consideration that many of the new furnaces recently erected there and in other Southern States have not yet gone into blast. When they do, the increase in the production of Southern iron as compared with the North will be still more marked.

But even without these new furnaces the South makes a sufficiently favorable exhibit and if we go back and make comparison with the census year, it will show the rapid development of this industry. Omitting the States of Maryland and West Virginia, which are usually not included in the industrial South, the comparison is as follows:

	Tons.
July, 1888, to July, 1889	1,245,584
Census year (1879-80)	212,022
Increase, tons	1,033,562
Increase, per cent	487

The South, which now produces nearly one fifth of all the pig in the United States, has a right to consider itself an iron country.

NEGRO *vs.* "POOR WHITE TRASH."

Mrs. Ellen M. Pugh a large plantation owner of Louisiana, and a near relative of Senator Pugh, of Alabama, now visiting in this city, has been interviewed by the Toronto *World* regarding "The Negro and his Place" in the Southern States. According to the *World*, Mrs. Pugh claims to be one of the warmest friends the Southern negro has, having lived among them all her life, and knowing them thoroughly. "Well treated and kept in their place," Mrs. Pugh says, "they are a very amiable, faithful, docile, and devoted people. But they must be kept in their place, and that place is on the plantation. His remaining there, or returning to it when he has left it, is his only salvation, and it is the only salvation of the white men who own the plantations."

Mrs. Pugh's views are strongly at variance with recently developed facts regarding the Southern negro. Recently the Chattanooga (Tenn.) *Tradesman* instituted an enquiry with reference to the value of negro labor in industrial channels in the South. The enquiries were sent to 300 leading Southern manufacturers, representing blast furnaces, rolling mills, miscellaneous iron works, mines, lumber mills, sawmills, etc. Replies were received which represent 9000 negro employes, of whom 2500 were skilled. The average wages paid common negro labor is $1.10 per day, and skilled labor runs from $1.75 to $2.25 per day, although several correspondents pay colored puddlers, beaters and rollers as high as $4 and $5 per day, and many furnaces pay as high as $2.50. The replies, without a single exception, show that there is no difference at all between the pay of whites and blacks for the same class of work. The manufacturers are practically unanimous in the opinion that for common labor in the Southern States the negro is more efficient and useful than the white man, and, without an exception, they declare themselves well satisfied with the negro in the factory, and announce their determination to continue him in his place. Many state that he is making progress in skilled work. The *Tradesman* adds that the condition of the negro is constantly improving, and as an industrial factor his usefulness is now recognized by all.

By this it will be seen that the Southern negro is really more valuable in certain mechanical trades than the ordinary white man in that section; and it is also clear that the solution of the dark problem in the South does not lie in the direction of the confinement of the negro to agricultural labor on the sugar, rice, and cotton plantations, as Mrs. Pugh suggests. The fact is, that as between the average "poor white trash" of the South and the Southern negro in the race for existence and usefulness, the colored man is fast getting ahead of his white brother. Under the stimulus of want and great personal discomfort, the negro will turn his hand to any employment that offers, while the white man wears out the seat of his trousers and repines at his unfortunate condition.

THE IRON TRADE IN THE UNITED STATES.

The iron trade in the United States, as indicated by the production of pig iron, continues to expand in volume. For the first six months of the present year the product in net tons of 2,000 pounds was 4,107,899 tons, being 725,396 tons more than in the corresponding period of last year, and 221,895 tons more than in the last half of the year. Among northern States, New York, New Jersey, Pennsylvania and Ohio have made some progress; but the greatest gain appears to be recorded for the Southern States, especially Alabama and West Virginia. Those two States have vast supplies of ore and coal, the mines of which have been opened only within the past few years, and they bid fair to become fast rivals of Ohio and Pennsylvania at an early day. The total production in the past six months of this year was 437,121 tons, against 329,454 tons in the second six months of 1888, being an increase of 107,667 tons, or nearly one half the increase for all the States. The cheapness of production in those States is also an important element in the record, and the drop in prices has been occasioned by their competition. In fact they have surfeited the market, and the stocks unsold in the hands of manufacturers was 563,286 net tons at the end of June, as compared with 336,161 tons at the beginning of January.

This most gratifying expansion in the pig iron trade of the United States causes no little uneasiness on the part of Free Traders both in that country and Canada, for it is a most forcible illustration of the benefits of Protection. And although the production of pig iron in the United States is so large, large quantities of the article are imported from Great Britain, chiefly for consumption in and near seaboard cities. Free Traders are pointing to the fact that the iron makers of New England, because of their inability to successfully compete with those of Alabama, intend petitioning Congress to remove the present duty upon iron ore, coal and coke, and to reduce the duty upon pig and scrap iron to what it was before the war, towit, a duty of 6 per cent. *ad valorem*. But there

is no necessity of acceding to either of these requests, for to do so would be to strike a heavy if not fatal blow, to iron making interests generally throughout the country, which are very large and valuable, for the sake of helping those in New England, which are comparatively small and inconsequential.

Discussing this move on the part of the New England makers, and the situation generally, the London *Advertiser* says :—

This is just what might have been expected of a high tariff in a country like the United States, or in any country for that matter, with time to develop it. The New England iron workers are complaining now, and soon it will be the turn of the iron men of Pennsylvania and Ohio Meantime the iron workers of Great Britain keep their old place at the head of the column ; for, although their exports of products to the United States may be growing less for a variety of reasons, they are finding new markets in every quarter of the globe, and no country in which protection prevails is able to compete with them outside of its own territory. In the first six months of 1887 more than one third of the total exports of iron from Great Britain went to the United States, whereas in the first six months of the present year the total to that country was only a little more than one seventh ; but, on the other hand, while the exports of Great Britain to all countries in the first six months of 1887 was 1,983,311 tons, it was in the first six months of the present year 1,990,901 tons.

The New England iron makers want iron ore, coal and coke put on the free list, and the 6 per cent. *ad valorem* duty upon pig and scrap iron restored as they were before the war. In 1860, at the beginning of the rebellion, the average price of foundry pig iron in Philadelphia was $22.75 per gross ton, and that price was lower then, owing probably to the prevailing excitement regarding the impending trouble, than it was five years before, in 1855, when it was $27.75 per ton. At the close of the war, in 1865, and before the Morrill tariff came into force, the price of iron was $46.12½ a ton, from which time, and under the operations of Protection, the price gradually receded, until now it is quoted at about $17. At the dates here mentioned, the highest prices of Scotch pig iron at British shipping ports, as compiled from Fossick's History of the British Iron Trade, were as follows : In 1855, 90 shillings per ton ; in 1860, 65 shillings ; in 1865, 55 shillings, and in 1887, 48 shillings. In other words, the price of Scotch pig, in Great Britain, receded from 55 shillings in 1865 only to 48 shillings in 1887, a difference of only about $1.68 per ton, while under a high protective tariff in the United States the recession has been from $46.12½ in 1865 to $17 in 1889, a difference of more than $19 per ton.

The *Advertiser* is mistaken when it says that Great Britain retains its place at the head of the column as a manufacturer of pig iron, for this is not the case, the output of that protected industry in the United States last year being considerably greater than that of the United Kingdom. As our contemporary shows, the United States is a large consumer of British iron. The United States does not seek at this time to be an exporter of pig iron, for the home consumption is greater than the home production, else there would not be such a large demand there for British iron.

The New England phase of the matter is but a side issue which does not affect the main question ; and our Free Trade friends cannot make any tangible points against Protection in discussing it.

EDITORIAL NOTES.

OWNERS of American steel plants are advised to put up lightning rods tipped with gold—gilt-edged, as it were—if they would have British capitalistic lightning strike them.—Cleveland, O., *Iron Trade Review.*

'THE tiny pebble cast upon the glassy bosom of the deep sea in a dead calm." This is the methaphorical and adjective style that "Eli," of St Louis *Farm Machinery*, uses in alluding to a recent occurrence. "Eli" is excitable. Suppose the tiny pebble should be cast upon the glassy bosom of the deep sea during a fierce storm ! The "ripple" would be fearful to contemplate.

IT is well understood that the cereal crops now being harvested are the best Ontario farmers have been favored with for many years. Wheat will be above the average, although not up to the quantity or quality which was at one time expected. Barley, however, will be an excellent crop, both in quantity and color. As a result the sales of binders and reapers have been larger in Ontario than was expected.

AN apparatus is now on exhibition at the Paris Exposition in which a person's photograph is taken automatically upon the insertion of the requisite coin in the slot. It is constructed so as to execute all the photographic processes necessary in order to obtain a photograph upon the insertion of the required coin. The whole mechanism is operated by electricity through the medium of storage batteries and electric motors, as well as the action of electro-magnets which are temporarily energized at the proper time.

THE Inter-State Commerce Committee of the United States Senate did not get much satisfaction in Chicago in making up a case against the Canadian railroads. The heavy shippers of grain, flour, etc., were unanimous in praise of the liberal policy of the Canadian roads, and the accommodations afforded shippers in reaching the Eastern markets, especially those of New England. Some of the railroad magnates and New York business men may not relish the truth, but the truth nevertheless remains that the Canadian railroads prevent the establishment of toll stations to rob the Western producer and shipper.—*American Miller.*

THE measures adopted ten years ago by the Austro-Hungarian Government to encourage sericulture in Hungary, have been very successful. This industry now affords employment to 40,423 families, as against 1,059 in the year 1879. Not long since there were only a few mulberry plantations scattered over certain districts, but now there are 1,500 well cultivated and under Government supervision. In the first year after the State establishments had been started, the country's total production consisted of 2,507 kilos of cocoons, which were sold for 2,809 florins ; last year the silk-worm breeders obtained a crop of 703,488 kilos, valued at 724,260 florins. Three large establishments, conducted on scientific principles, have been erected, and these give employment to eight hundred and fifty-two winders, besides other operatives.

A LARGE number of importers of sewing machines have got into trouble with the Customs Department, and during the past few weeks quite a number of seizures have been made by special detectives of sewing machines, attachments and needles. It appears that from some cause the duty on sewing machine needles had fallen fully 50 per cent. during the past year or two, and a little enquiry showed that a regular system of undervaluation and smuggling has been going on. Quite a number of cases have been detected, and their investigation is now under consideration. The whole management of the matter reflects great credit upon the efficiency and astuteness of the special officers who were detailed to investigate the matter, and the speedy manner in which the culprits have been brought to book will in all probability have a deterrent effect in future.

THE figures of British exports of tin plates to the United States during the first six months of this year show a large increase over those in the corresponding period of 1888. The quantity was 179,501 tons, valued at £2,459,875—an increase on last year of 39,077 tons and £420,857, and upon 1887 of 44,191 tons and £669,392. The total exports amounted to 224,473 tons, of the value of £3,106,326. It will be seen from these figures how important the trade with the United States is to the British tin plate industry. The Continental countries and Australia were the other principal consumers. The tin plates and sheets sent to the United States during the single month of June were 29,269 tons, valued at £399,945. This was an increase on June, 1888, of 6,199 tons and £81,787. Compared with June, 1877, the enlargement is 3,902 tons and £66,874.

A CORRESPONDENT who is a "A Manufacturer" appeals to other manufacturers to unite and send a strong deputation to Ottawa to interview the Minister of Customs to protest against the practice of the Department of enforcing the payment of duty upon articles which are not specially enumerated in the schedule, but which supplement other articles now upon the free list, reference being had particularly to those newer dyes and coloring matter used in the manufacture of textile fabrics. Our correspondent's contention is that where human ingenuity produces improved and better articles than those now generally in use, the novelties should be upon the free list if the articles they supplement are upon that list. It is not right that the Minister of Customs should persistently ignore the representations of the manufacturers in this matter, particularly in view of the fact that these new dye stuffs are not made in Canada, nor are they likely to be very soon. This is a matter of great importance to the manufacturers, but it seems certain that if they are really desirous of having proper attention paid to their demands, they should take united and vigorous action. It will not be accomplished in any other way.

WE direct the attention of American farm machinery and other trade journals to the following fact, which is vouched for: A few days ago, on a farm near Peterboro', Ont., a lad was driving a team of horses attached to a reaper which was cutting grain in a wheat field. A dog was lying asleep in the grain, and the reaper cut off his tail and hind legs. The howling of the dog frightened the horses, which ran away, the boy fortunately jumping clear of the machine, and escaping unhurt. When the horses and reaper arrived at the other side of the field, at a fence, it was found that forty-seven sheaves of grain were on the machine table, which had been cut and bound in transit, and no injury had been done to the machinery. The dog, hearing the racket, ran after the runaway horses and caught the bridle of one of them before they could turn and start away from the fence. The tail and legs of the dog were found securely bound up among the sheaves of grain. This machine and the dog, it is expected, will be on exhibition at the forthcoming Toronto Fair. American farm machinery manufacturers should come to Canada for new and useful ideas in their line of business.

A WEALTHY Mennonite by the name of Renfel, of Getna, Manitoba, recently purchased two threshers and engines in the United States, for which he paid in cash about $3,000, besides $900 import duty, together with $140 freight. When they arrived a local implement agent reported to the government that they had been manufactured by convict labor. The machines and engines were seized by the authorities, and, it is said, will be destroyed, as it is contrary to Canadian law to import anything from the United States made by convict labor. Mr. Renfel, who was ignorant of this law, will have to lose the whole amount, and if his good senses come back to him, that part of Her Majesty's domain will lose a good and prosperous citizen.—*St. Louis Farm Machinery.*

Mr. Renfel is gaining knowledge by sad experience. He was violating a law of the land, and foolishly so, too, for he might have bought just as good farm machinery, made in Canada, and as cheaply. "Ignorance of the law excuseth no man." But while Mr. Renfel may lose the value of his investment, he probably has better sense than to abandon Canada on that account, where he has already become a "good and prosperous citizen" Canada does not have necessity to import much Yankee machinery under any circumstances; and under no circumstances will she allow the products of prison labor to be brought into her territory.

THE Toronto *World*, under the sensational headline, "The Deadly Gasoline Stove," publishes a press telegram from Baltimore which relates that "while John Myers, a carpenter, was at work on a building, a gasoline stove exploded within, and the dwelling was threatened with fire. Myers grasped the stove, around which the flames were leaping, and, raising it to his shoulders, ran into the street. The gasoline poured down his back and arm. The flames were burning his flesh, but he clung to his fiery burden until he had conveyed it where it could do no further damage. When he dropped his burden he was suffering intense torture. The bystanders extinguished the flames.' Evidently some foolish person had overflowed the tank while replenishing it with gasoline while the stove was burning, allowing the inflammable fluid to become ignited. John was a fool for attempting to remove the stove to the street under the circumstances. If he had let it alone, the gasoline would have burned itself out, and no great harm would have been done. The flame could have been extinguished as well in the house as in the street. By the way, why don't the *World* procure evidence to show that this gasoline stove really "exploded"? A thousand dollars awaits the discoverer of any well-authenticated case of explosion of a gasoline stove. Gasoline stoves can't explode.

An American contemporary alludes to the fact that certain farm machinery that had been bought in the United States by a Manitoba farmer, had been confiscated and destroyed by the Canadian authorities because it had been manufactured by convict labor. It is contrary to Canadian law to import merchandise from any foreign country made by convict labor. Our tariff affords fair protection to Canadian manufacturers against foreign goods made by free labor, but the products of convict labor are entirely excluded, as they should be. But recently another American contemporary, investigating the subject of convict labor in the carriage and wagon trade in the United States, discovered that, according to a report of Hon. Carroll D. Wright regarding that system in 1886, the convict-made wagons, carriages and parts in that country amounted in value to $2,000,000, representing the labor of 1,376 prisoners in the penal institutions in eight States. This would give somewhere near 40,000 wagons as the result of convict labor for one year. In Kansas, the State receives for the labor of the convict about 3½ per cent. of the finished product. Tennessee gets about 7¾ per cent., and Michigan about 13⅓ per cent. of the value of such product. It is to protect Canadian workmen and manufacturers against such competition that Canada has a law entirely excluding the products of foreign prison labor.

Railway construction and operation in Canada began in 1837, when sixteen miles were opened for traffic. In ten years that mileage had increased to fifty-nine, and in 1852 to 212 miles. From that date—which marks the starting point of the Grand Trunk system—rapid progress was made, the miles of road in operation in 1860 being 2,087. In 1875 that figure had grown to 4,826 miles, carrying 5,670,836 tons one mile. In 1880 the figures were 6,891 miles and 9,938,858 tons; in 1885, 10,149 miles and 14,659,271 tons. On the 7th of November of that year the last spike was driven in the Canadian Pacific line, and the road was opened for traffic on the 28th of June, 1886. The total mileage in Canada at present is over 13,000, and the tonnage of freight carried last year was 17,173,760. The rate of growth in recent years is marvelous. The cost of railway building in the Dominion, compared with that of other countries, gives the advantage as to economy very clearly to the former. The cost per mile in Great Britain was $206,500; in Germany, $103,000; in France, $134,000; in Italy, $94,700; in Belgium, $123,400; in Holland, $95,200; in Russia, $97,200; in the United States, $61,000; in Canada, $61,000. In accommodation proportionate to population Canada came next to the States in 1884, and is now in advance of that country—there being a mile of railway to every 470 inhabitants.

British Columbia first rose from the position of a fur country to that of a colony on the discovery of gold upon the Lower Fraser in 1858. Its subsequent history for a number of years is, Dr. Dawson shows in his recent report to the Dominion Geological Survey, substantially that of the sudden rise and subsequent slow decline in importance of placer gold mining. Coal mining has, however, concurrently advanced slowly but steadily till it has attained its present pre-eminent position. There are four large collieries in full operation, employing 2,000 miners. The output for these collieries since 1853-1888 is about four and a half million tons, the markets being California, San Diego, Oregon, Alaska, Hawaiian Islands, China, Japan, besides Her Majesty's naval and other mail and trading steamers. The analysis given of these coals show that they are equal and in many cases superior to the North of England and Welsh coals. It is claimed that the evaporation power is 13.41 lbs. water per lb. of fuel. In practical work 9 lbs. is about the highest service attained, but 13.41 lbs. can be got by experiment. The anthracite coals analyse very well, but do not (as claimed) compare with the Pennsylvania anthracites, but are, at the same time, a good marketable coal. Carbonate iron ores are found in this coal formation. These, with the mixtures of the magnetites and hematites, should produce a good pig-iron and start the manufacture of finished iron and steel.

In view of the wonderful advances that have been made within a year past in developments of practical electricity, it is to be regretted that the management of the Toronto Exhibition have not made special efforts to have some such electrical displays as have recently been made at St. John, N.B., and other places. The recent affair at St. John was devoted entirely to electrical exhibits, yet it proved an abundant success; and considering the general character of the Toronto Exhibition, and the wide favor that it always meets with, we cannot but think that a serious omission has been made in not voting a sufficiently large sum to make all necessary arrangements, and inviting such electrical displays as would undoubtedly have been made. In the forthcoming St. Louis electrical exhibition, to be held under the auspices of the St. Louis Exposition Association, which will begin September 4th and continue six weeks, the management offer unlimited facilities for the operation and display of the products of the electrical and mechanical world. There will be no charge whatever made for space or power, and all appliances will be returned on the railway free of cost to the exhibitors. Seventy-five thousand square feet of floor space has been appropriated for the exhibit, and every aid will be given exhibitors for making an attractive display. Our Toronto Exhibition always offers most valuable facilities to exhibitors for bringing their displays to the attention of all Canada, and the important parts of the United States contiguous to Ontario; and a large and well arranged display of electrical apparatus and appliances thereat would not only add greatly to the general attractiveness of the affair, but would be an educational medium of putting the products of electrical science in a business way before the people.

Mr. R. Matheson, Superintendent of the Ontario Institution for the Deaf and Dumb, at Bellville, Ont., requests this journal to give publicity to the following letter:

Dear Sir,—You have doubtless noticed in various newspapers articles stating that a deaf-mute variety of the human race is likely to be the result, in the near future, of the marriage of deaf-mutes. From the information I have been able to gather up to this time, I have only learned of one deaf child in Ontario (a little boy now about four years of age) whose parents are deaf and dumb. Of the hundreds of children who are now attending, or have attended, this institution, there is not one congenitally deaf child who has deaf-mute parents. I would like to obtain full and accurate information in regard to this matter, and if you or any of your readers know of any deaf-mute married persons, with or without children, if you will

kindly send me their addresses, I shall feel obliged. There are deaf children of school age in the Province that I have not heard of, and I am making an effort to get them into this institution, where they may receive an education that will fit them for the duties of life. The condition of an uneducated deaf-mute is more deplorable than that of any other human being. Will you be good enough to help me to bring these children to school? You can do more than any other person I might address. The parents of some are not aware that an institution exists where their deaf children can be taught to read and write. There are others who have heard of the institution, but are probably not acquainted with its real character, or from other causes fail to send their children to us; these might be induced by a little effort to send them. Deaf children between the ages of seven and twenty are admitted, educated and boarded at the expense of the Province. It is only required that the child be of sound mind and that the parents, or the municipality, if the parents are unable, pay the railroad fare and provide necessary clothing. Application papers may be had by writing to me at Belleville, and any information required will be cheerfully supplied.

A CHICAGO man has invented a process by which, it is claimed, the manufacture of rolled iron and steel will be revolutionized. The device is intended for rolling liquid metal, and has been in use at the works of the inventor for many months, rolling sheets of solder to the thickness requisite for the caps of the tin cans there manufactured. This work had previously been done by the rolling mills at a cost to consumers of from eight to ten cents per pound, and the invention was the result of an investigation designed to save their expenses It consists of two hollow revolving rollers with the space between them graduated to the thickness desired of the sheets of metal to be produced. Pipes are extended from a movable crucible containing the molten metal, to a nozzle, wedge-shaped, and of the exact width of the rollers. Through this pipe, which is kept heated by gas jets, the molten metal is conducted from the crucible to the nozzle, whence it drops between the rollers, the supply from the crucible being regulated by a valve. The rollers, which are hollow, as above stated, communicate with water supply pipes through which said water is forced into their interior, where it is kept in constant circulation and discharged through an escape pipe in the axle. By this means the metal, immediately it strikes the rollers, is chilled, and passes out at the opposite side of the rolls on a sheet of metal, which is carried automatically on belts to a cooling room, and after being trimmed is rolled on spools, ready for use. The machine has only as yet been employed in the factory, where it turns out sheets of solder from six to eight inches in width, and fifteen one-thousandths of an inch in thickness, at the rate of four hundred feet a minute. The inventor, however, claims that the principles can be adapted to the manufacture of steel sheets, steel rails, and other products of steel.

AN official return which has been published in India shows the extraordinary growth of the cotton industries in that country. At the end of last year there were 97 cotton mills at work, with 18,840 looms and 2,375,739 spindles. They consumed 283,000,000 pounds of raw cotton, and gave employment to 80,515 persons, of whom, as far as details have been obtained, 46,605 were men, 15,057 were women, 12,403 youths of both sexes, and 2,949 children. The nominal capital of the mills worked by joint stock companies is returned at 90,000,000 rupees, and it is believed that the total capital invested in cotton manufacturing in India does not fall far short of £10,000,000 sterling. Of the 97 mills, 72 are in the Bombay Presidency, 50 of these being in the town and island of Bombay; 6 were in Bengal, all in and around Calcutta; 6 in Madras, 4 being in the town; 5 in the northwestern provinces, all in Cawnpore; and the remainder in different parts of India. The oldest of the Bombay mills was established in 1851, and in 1879 there were only 7; but by 1875 the number had increased to 22, and in 1880 it was 40. Ten more were added in 1881, and 23 between that and January, 1888. The last fourteen years have seen the creation of 57 out of the 72 Bombay mills, and ten more are now in course of construction, representing 2,400 looms and 250,000 spindles. The total area under cotton in India at the close of 1877 was 14,532,513 acres, of which about 5,500,000 were in Bombay and Scinde. Of woollen mills at the close of the year there were only 4 in all India; 2 at Cawnpore, 1 in the Punjab and 1 at Bangalore; 3 of these are joint stock, the aggregate nominal capital being 18,000,000 rupees. The number of looms was 263, and of spindles, 6,868. Two new woollen mills are in course of construction in Bombay.—London *Times*.

SPEAKING of the encouragement that should be given to new industries, especially in the smaller towns throughout the country, and of the influence such industries would have in restraining the more ambitious young people to remain at home and seek employment in them, the *Manufacturer's Gazette* says:—

Very few people seem to realize the benefits to their town or city by the location therein of new industries and manufacturing plants. The organization of boards of trade has done much to build up the towns where little or no manufacturing has been done. This is especially true of the smaller inland towns, who have heretofore been obliged to depend upon the larger places for a market for their products, and also for the employment of those who were obliged to earn a livelihood by means not provided at home, and in this way the benefit derived from a home demand has been withdrawn from the business interests of the village. The establishment of manufacturing industries in a town has a tendency to increase its growth and build it up. The townspeople are provided with a means of employment without seeking it in cities, the farmers find a good market for their products, and a large amount of money is kept in circulation which would otherwise go else where. It is a fact that cannot be denied, that the manufacturing industries are the leading ones in the country, and are what have created its wealth and power; and the stagnant condition of those places where there are no manufacturing interests is very noticeable. It is also a fact that at the present time the young men and women are leaving their country homes for the cities, to find employment in the great mills and factories. In order to prevent this loss, not only of money but of population, it is necessary to hold out some inducement to have them remain. And here it is that the boards of trade are doing a good work. Many of the little New England villages whose population has not increased in years, and from which most of the young men and women with push and energy have gone to find employment in larger places, are now waking up to the facts which the situation presents, and efforts are being made to provide a means for their employment nearer home. The result is that the places are becoming lively business towns, and the citizens are reaping the benefits. There is no reason why every town in New England should not have its manufacturing industry as well as its agricultural, and one will be an aid to the other.

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.

THE *American Architect and Building News*, of Chicago, in its issue of July 20th, publishes two designs made by Messrs. Knox & Elliott, of Toronto, for the city of Toronto, and accepted by the proper authorities. One is a design for the pavilion which is to be erected at High Park, and the other for the pavilion and band stand which has just been erected in Queen's Park. These both show fine artistic and architectural taste, and reflect the greatest credit upon our Toronto architects.

THE *Dominion Illustrated* is publishing a series of sketches by by Mrs. Arthur Spragge of British Columbian life and scenery. In a recent number she gives an interesting account of Col. James Baker's ranche, and of the Kootenay district and other points of interest on the Pacific slope. Other interesting features embrace illustrations of the Wimbledon team and the scene of the triumphs of our Canadian sharp-shooters. Several fine views of St John, N. B., the grass-hopper plague in Algeria, etc.

TARIFF INCONGRUITIES.

Editor of CANADIAN MANUFACTURER,—

SIR,—Some time since I had the honor of addressing you upon the anomalies of the present Customs Tariff. Since then the Government have been wise enough to alter certain matters that I consider to be mistakes of considerable importance. The duty upon sago flour, however, remains as it was at over 100 per cent. duty.

The duty upon new chemicals not made in this country, and supplanting chemicals admitted duty free, also remains as it was. The Daniels who sit in judgment still refuse to recognize the justice of admitting such chemicals duty free, and, like Shylock, still claim their pound of flesh because it is "in the bond." What are the manufacturers doing that they should quietly sit down and let injustice rule over them? Why should they be debarred from taking advantage of the brains, science and experience of other countries? Why should they be handicapped to the detriment of this country and to the foolishness of the National Policy? Are they afraid of the wise and learned gentlemen who are appointed to carry out a tariff which they do not understand? The Minister of Customs is, so far as my experience goes, open to argument. Why should not a deputation of the trade seek an interview with the honorable minister and explain to him these matters? Were this done, if I mistake not, the tariff would be placed, so far as it concerns manufacturers at least, upon a sounder and more reasonable basis. To correspond with the customs officials is only vexation of spirit; and one manufacturer may growl for a century with no satisfactory result.

If Canadian manufacturers are to make their business a success, they must be prepared to adopt every new discovery that comes out; and they must not be hampered by effete officialism which prevents their being able to profit by such discoveries as are made from time to time. I am, yours truly, A MANUFACTURER.

THE LABOR TROUBLE AT GALT.

Editor of CANADIAN MANUFACTURER,—

SIR,—The labor difficulty in Galt has reached a crisis which indicates that the manufacturing industries of that sturdy town are likely to suffer seriously, and, if so, the material prosperity of the whole town will receive a permanent check. It is needless to say that Galt is noted in Canada for its manufactures. The machine works of Goldie & McCulloch were established early in the forties by the late James Crombie & Co., who retired from their management after a most successful career. The present proprietors were employees of that firm, and purchased the works with small capital which consisted of their savings as workmen. They assumed heavy obligations, but by superior ability and thorough knowledge of the mechanical and business details of the business, succeeded in placing the establishment in the very front of Canadian manufacturing industries. These works are to-day the largest private concern in the country, the most perfectly equipped, and most systematically managed. Nowhere are employees treated with greater consideration. They have gathered a staff of workmen who have no superior anywhere; in no establishment has work been more constant; and the very large number of comfortable residences owned and occupied by them is an evidence of their thrift and good conduct, and a testimony to the regular employment and good wages which they have received. The works of Macgregor, Gourlay and Co., Cowan & Co., and Cant Bros. & Co., which are also engaged in similar manufactures, can also be placed in the same category. It is within the mark to say that more than 700 men are employed in these machine works, and from this it may be judged that any disarrangements of business caused by strikes or discontentment will produce evils which may prove disastrous.

The moulders who are attempting to dictate to their employers are principally unmarried men who have little or nothing at stake except their wages, and, as is well known, a change of location is by them considered of but little moment. Still by combination under the secrecy of their union, they bring about complications which may throw this large body of men entirely out of employment, and permanently injure the business of the works in which they have been employed. It is said that only about seven per cent. of the workmen are moulders, but their capacity for mischief is unbounded, as the work of the moulder lies at the root of the whole industry.

The complaint of the proprietors that many thoughtless people in Galt have shown their sympathy with the malcontents, and given encouragement in the hostile demonstrations that have taken place against moulders who had been engaged to take the places of the strikers, is something which augurs badly for the spirit of fair play which ought to animate every person who wishes well for the prosperity of the town. It is every man's right to decline work if he wishes to do so, but the right of others to accept employment without interference ought also to be admitted; and if necessary, the citizens of Galt should rally in defence of law and order and liberty of action. In Galt, as in every other place, there are men who always trim their sails to catch the passing breeze, in the hope of gaining temporary popularity. "Demagogues, like critics, are always ready made" and at hand. The countenance which the strikers are receiving from these schemers and popularity-hunters is encouraging them to proceed to intimidation against workmen who have signified their intention of taking the places of the strikers, and mob rule is the result. It remains to be seen whether the municipal authorities have the necessary nerve to do their duty and punish law-breaking; and whether the business men and sensible people of the town will strengthen their hands by timely action. If they do not, Galt's supremacy as a manufacturing centre is at an end.

FIAT JUSTITIA.

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.

MESSRS. M. A. RUSSELL & Co., Morris, Man., are erecting a grain elevator at that place.

THE Moncton, N. B., Sugar Refining Company are making considerable additions to their works.

MR. W. G. BURNETT, manufacturer of lace leather, Galt, Ont., has begun the manufacture of wool mats.

THE town of Russell, Man., has voted a $5,000 bonus for the erection of a 60-barrel roller flour mill at that place.

THE machine shops and foundry of Mr. George McKenzie, at Collingwood, Ont., were destroyed by fire August 10th.

MESSRS. LUDLAM & AINSLIE'S heading factory at Comber, near St. Thomas, Ont., was destroyed by fire Aug. 3rd, loss about $3,000.

THE Grand Trunk Railway Company are erecting two new workshops at Peterboro', Ont., one 40x35 feet and the other 31x30 feet.

A SEVEN foot seam of coal has been struck near Medicine Hat, Assa., at the depth of 235 feet. At 200 feet a 4½ foot seam was struck.

MESSRS. F. G. LYNDE & Co., Madoc, Ont., operate a well equipped tannery, their output being about 150 sides of leather per week.

ONE of the nine grain elevators being erected on the line of the Northern Pacific Railway, in Manitoba, will be at Morris, that province.

THE Indian Department of the Dominion Government has granted a $1,500 bonus towards the construction of a grist mill to be erected at St. Albert, Alberta.

MESSRS. J. & J. WHITE, Madoc, Ont., are manufacturers of agricultural implements, included in which are reapers, horse-rakes, plows, gang-plows, etc.

MESSRS. AITKEN & SON, Alliston, Ont., are manufacturers of cast iron work for cultivators, mill machinery, iron fencing, etc. Their factory is 150 x 56 feet.

THURSDAY, August 8th, inst., was the thirty-first anniversary of the existence of the well known manufacturing firm of Goldie & McCulloch, of Galt, Ont.

MR. T. P. HODGSON, Alliston, Ont., is a manufacturer of wooden pumps, his factory having been established in 1867. His output is about 1,000 pumps a year.

THE Standard Needle Company, Paris, Ont., are offering for sale an iron turning lathe in good order. It is 12-inch over sheens, 20-inch gap and 6-foot bed.

THE construction of the new suspension bridge over the Ottawa river at the Chaudiere, for which an appropriation was made in 1888, has been commenced.

THE Canadian Hosiery Company, of Beeton, Ont., of which Mr. George Everall is manager, are manufacturing 100 pairs per day of his newly patented "Arctic" sock.

THE Forbes Manufacturing Company of Halifax, N.S., have been awarded the contract for putting a new steel and iron floor on the Sackville, N.B., railway bridge.

MESSRS. E. QUENNELL, T. D. Jones and others, at Nanaimo, B.C., have formed a company with $30,000 capital stock and will erect a large leather tannery at that place.

MESSRS. STEVENS, HAMILTON & Co., machinists, Galt, Ont., will increase their capacity by the erection of a new machine shop 60 x 30 feet, and other necessary buildings.

THE Canada Sugar Refinery Company are making considerable improvements at their works, including a new wing to the main building, and a quantity of new machinery.

INFORMATION from Three Rivers Que., is to the effect that preparations are being made there for the erection of extensive iron works which will give employment to 600 hands.

MESSRS. FERGUSSON, ALEXANDER & Co., manufacturers of paints, colors, varnishes, etc., are making extensive alterations to their works and will add considerable new machinery.

THE new wincey mill in Paris, Ont., now runs night and day, with two sets of hands. It is lighted by incandescent light. The quality of goods produced is pronounced first-class.

THE Lakefield Roller Mill, at Lakefield, Ont., is a substantial 4-story building equipped with best machinery, with capacity to produce 125 barrels of flour a day. Mr. John Hull is proprietor.

THE sawmill of Messrs. Wood & Co., at Nixon, Ont., was destroyed by fire July 28th, loss about $10,000. This mill included the planing, stave, heading, shingle and lath machinery of the firm.

THE Londonderry Iron Company, whose works are near Londonderry, N.S., will pay out in wages to their workmen this season $252,000. They will also pay the Intercolonial Railway $100,000 for freight charges.

MESSRS. MOSSOM, BOYD & Co, Bobcaygeon, Ont., employ 150 hands in and about their saw mills, which have capacity to cut 100,000 feet of lumber a day, the aggregate yearly cut amounting to about 14,000,000 feet.

A MOUNTAIN of fine pink marble has been discovered in Hants County, N.S., which is pronounced to be of the best quality. Some hundreds of tons have already been quarried and shipped to New York for interior decoration.

THE Oshawa Stove Company, Oshawa, Ont., are manufacturing a novel laundry iron for Messrs. Hastings & Finnie, of that town. It is constructed to burn charcoal as fuel, and will operate an hour or more without replenishing.

THE North Hastings Lumber and Manufacturing Company, Madoc, Ont., are manufacturers of doors, sash, blinds, mouldings, cheese-factory supplies, etc. They also operate a lumber mill, and manufacture dressed lumber, etc.

THE Canada Galvanizing and Steel Roofing Company has been incorporated at Montreal with a capital stock of $50,000. The objects of the company are the business of galvanizing steel and metal roofing and general metal work.

MESSRS. F. G. STRICKLAND & Co., Victoria, B C., will make an extensive display of farm implements and machinery at the forthcoming exhibition of the Victoria Agricultural Society. The machinery will be put in motion by steam power.

THE Alliston Roller Mill, at Alliston, Ont., which was built in 1851 and run on the old stone system, was converted into a first class roller mill in 1886. It is a four story building 64 x 36 feet, with capacity to manufacture 75 barrels of flour a day.

MESSRS. WALKER & CUNNINGHAM, proprietors of the Walker Woolen Mills at Alliston, Ont., manufacture about 15,000 pairs of blankets a year, and 40,000 yards of other woolen goods. The mill, which is of brick, is 126 x 36 feet, and has two sets of machines.

THE Methodist Missionary Society have purchased a sawmill plant from F. G. Strickland & Co., which will be erected at a point near Fort Simpson. The mill will be driven by water power. It has a capacity of 10,000 feet per day.—Victoria, B.C., *Colonist.*

THE Magog Textile and Print Company, at Magog, Que., are introducing into their works ten pairs of Curtis & Son mules, supplied by Messrs. F. A. Leigh & Co., of Boston, Mass., who will also supply these works with a quantity of card-room machinery.

THE Kewatin Milling Company, of Winnipeg, will at once begin building elevators throughout Manitoba. One will be built at Carman, one at Plum Coulee, one at Gretna, and two at points not yet determined upon, although Deloraine will probably be one.

THE D. A. Jones Company, of Beeton, Ont., of which Mr. Frank McPherson is manager, are engaged largely in the manufacture of bee-hives and bee-keepers' supplies. Employment is given to about 30 hands, and the product is about 500 hives and 25,000 hive sections a day.

THE Canada Switch Manufacturing Company has been incorporated with a capital stock of $50,000; headquarters at Montreal. The objects of the company are to manufacture and sell railway switches and parts thereof, and all appliances therefor and connected therewith.

MESSRS. F. G. STRICKLAND & Co., VICTORIA, B.C., dealers in machinery, etc., have recently taken extensive orders for saw mill

machinery, including machinery for a large mill to be built at or near Fort Simpson, B. C., which orders have been sent to manufacturers at Galt, Ont., to fill.

MESSRS. HUMPHREY & SNOW, Moncton, N.B., will build a 100 x 30-foot addition to their woolen mills in that town, increasing their capacity about 50 per cent. This factory now gives employment to 44 hands. Previous to the introduction of the National Policy it was simply a country carding mill.

MESSRS. COWAN & PATTERSON, Victoria, B.C., will build a saw-mill with 100,000 feet a day capacity, at or near Alberni Vancouver Island. San Francisco capitalists are said to be interested in the enterprise, and an Australian firm have contracted to take all the output of lumber from this mill.

MATERIAL for the manufacture of the best quality of Portland cement has been discovered on the Gale farm of Mr. H. Hogan, near Montreal. Specimens of stone made of cement from this deposit show breaking strains after three and seven days under water of 150 lbs. and 280 lbs. respectively to the sectional square inch.

MR. W. T. THOMSON, of Paris, Ont., has set up a Kay incandescent light plant in that town, and is furnishing light for churches, Mechanics' Institute building, and many of the business places. He purposes supplying private residences also, and, in the absence of gas works, there is a good prospect that the enterprise will be well patronized.

MR. D. M. CLARK, Toronto, manufacturer of Clark's wooden picket wire fencing, informs us that he will have works in operation at the grounds at the forthcoming Toronto Industrial Exhibition. He describes this fencing as being cheap, handsome, durable, portable, light, bull-strong, horse-high, pig-tight, stout as a stone wall, and as visible as a board fence.

THE Madoc Roller Mills, Madoc Ont., Fred Rollins, proprietor, is a 4-story brick and stone building 40 x 50 feet, with a capacity of 100 bbls per day. Three years ago the roller process was introduced, stones being retained for grinding feed, and with its 80-horse-power Leonard & Son engine and new 100-horse-power steel boiler, is one of the best equipped mills in the Province.

THE two pickle factories managed by Messrs. Davidson Bros., of Halifax, N. S., and John Gertridge, which were started last year at Gaspereau, N. S., have given an impetus to the cultivation of the cucumber, and the farmers in that section in raising them find that it pays well. It is expected that upwards of 30,000 bushels will be raised this season in the immediate vicinity of these factories.

THE Wm. Hamilton Manufacturing Company, Peterboro, Ont., have received an order from the Victoria Lumber Manufacturing Company for five large steel boilers and other machinery for their new lumber mills at Chemainus, B.C. ; and from the McLaren Ross Lumber Company an order for ten steel boilers and a refuse burner, this latter to be 140 feet high and 26 feet diameter at the base.

ELIAKIM FISHER is taking steps to develop a large deposit of mineral paint on his farm at Scoudac, six miles from Shediac, N.B. The paint is a dark red and has been used by farmers in that vicinity for several years, and was recently analyzed in Boston and declared to be of the very best quality. Mr. H. A. Jones of Peters, Jones & Lounsbury, Moncton, N. B., has also used this paint with good results.

THE Northern Pacific and Manitoba Railway will erect several important buildings in Winnipeg. Man.; included in which will be a stone and brick roundhouse 270 feet in diameter ; a stone and brick car-repairing shop 240 x 100 feet, and a blacksmith shop 100 x 60 feet. All the principal repairing will be done at these shops, which are to be equipped with the most effective machinery and appliances.

THE Wm. Hamilton Manufacturing Company, Peterboro, Ont., supplied all the machinery of the large shingle mill recently erected at Revelstoke, B.C., by a lumberman from Michigan named Valentine. This machinery, Mr. Valentine declares, is the equal in efficiency of any he had ever seen in Michigan or anywhere else. This mill has a capacity to manufacture 120,000 shingles a day.

THE Dossett Manufacturing Company, Peterboro, Ont., who recently took over the plant of the Lindsay-Seldon Furniture Company, of that town, have begun work with quite a number of hands, which is soon to be increased. When in full operation the factory will employ a large number of hands, and in addition to making fine furniture, will manufacture several specialties, including the Dossett patent lounge.

MESSRS. JOHN A. HUMPHREY & SON, Moncton, N.B., are making considerable improvements and additions to their woollen factory. This factory was first put in operation in 1882, and is equipped with two sets of cards, three jacks and twelve looms, the machinery being driven by a 75 h. p. steam engine. A new brick weaving building, 90 x 34, will be erected. The consumption of wool is about 140,000 pounds a year.

THE Lakefield Lumber and Manufacturing Company, Lakefield, Ont., operate several important industrial works there. They operate a large saw-mill employing 125 hands, and manufacture lumber, lath and shingles. The cut this summer has been 10 000,000 feet of lumber, 3,000,000 lath, and 100,000 shingles. The company are owners of a roller flour mill, a planing mill, and are also proprietors of the electric light plant.

J. L. MUDGE, manager of the Anthracite coal mines, states that the output of the mines at Anthracite is steadily increasing, and it is expected that ere long the amount of coal turned out of the shafts daily will total up at least 1,000 tons. It is true that an English syndicate has bought an interest in the mines. Many of the seams are from thirteen to twenty-five feet in width, and there s enough already located to last for probably 100 years.—Vancouver, B. C., *World*.

THE J. B. Armstrong Manufacturing Company, Guelph, Ont., in speaking of their improved jump seat and other vehicles, mention the fact that finished buggies are damaged more or less in shipping, and often need a fresh coat of varnish to make them saleable, but that their buggies, phætons, jump seats, wagons, carts and gigs, in the white, go at a lower rate of freight, and the arriage makers see the quality of the material throughout they are getting. They do their own painting, and thereby have a fresh looking job to show their customers.

MESSRS. JOHN BERTRAM & SONS, proprietors of the Canada Tool Works, Dundas, Ont , took their entire force of workmen down to Hamilton Beach last week, together with their sisters and their cousins and their aunts, their wives and sweethearts, the party amounting to over 1,500 persons. It is said that only a cripple, a small boy and a yellow dog were left in Dundas on the occasion, but there is no explanation given why these three unfortunates should have been left behind.

CONTRACTORS have begun active work on the bridge across Fraser river, forty miles east of New Westminster, B.C. Surveys are completed to the American boundary, and the construction of the road will begin within a week. This is the route by which the Canadian Pacific will make American connections. The Seattle, Lake Shore and Eastern, on which work is now going forward from Tacoma, will be met at the boundary line. Connection will be made before the summer is over.

THE Brockville Agricultural Works at Brockville, Ont., Messrs. G. M. Cossitt & Bro., proprietors, include a main building 290 x 50 feet, three stories high ; moulding shop 100 x 50 feet ; coal and sand house, 100 x 40 feet, and wareroom 150 x 40 feet, three stories high. The principal manufactures are the Buckeye mower—for one and two horses, one wheel single reaper, Ithaca horse rake, the tiger horse rake, a spring tooth harrow and the "Golden Age" rotary disc harrow. These works give employment to about 140 hands.

A SIENNA deposit covering 30 acres has just been discovered on a farm about three miles outside of Aurora, Ont. Samples of the mineral have been sent to paint manufacturers of New York, Chicago and Montreal, and they have reported that it classes second to none. Heretofore Canadian and American manufacturers have drawn their supplies from Italy, where the best deposits are, and from England where it ranks second quality. The newly discovered Aurora sienna is said to rival in richness even the Italian article, and a company with American and Canadian capital behind it is being organized to place it on the market.

MESSRS. BROWN BROS., of the St. Alice Hotel, Harrison Hot Springs, B. C., have discovered a valuable deposit of sienna on the shore of Harrison Lake, about twenty miles from the hotel. The earth is pronounced by experts in Montreal, Chicago and San Francisco to be a very superior article. The supply is inexhaustible, and within easy reach of the lake. Very little cost will be entailed in developing it, and no difficulty experienced in bringing it to market. A company is now being formed to work the claim, men being engaged cutting roads and preparing the ground for operations.—Victoria, B.C., *Colonist*.

A SIMPLE plan preventing sheet iron stacks from rusting is as follows : If before raising the new chimney, each section, as it comes from the shop, be coated with common coal tar, then filled with

light shavings and fired, it will resist rust for an indefinite period, rendering future painting unnecessary. In proof of this is cited a chimney which was erected in 1866, treated as above described, and is to-day as bright as the day it was raised, without having a particle of paint applied since. The theory by which we account for this result is that the coal tar is literally burned into the iron, closing the pores and rendering it rust proof.—*American Artisan.*

MR. W. H. FROST, proprietor of the Smith's Falls Malleable Iron Works, Smith's Falls, Ont., informs us that on August 7th inst. he started up his works after a shut-down of only ten days. The shut-down was to enable him to place his works in thoroughly first class condition, to turn out during the coming season larger quantities than ever of the specialties manufactured by him, and for which he is experiencing a large and increasing demand. Among his products are included all sorts of malleable iron castings for agricultural implements, carriage hardware, etc.

WARNOCK'S Galt Edge Tool and Carriage Spring Works, Galt, Ont., now rapidly being completed, will be, it is claimed, the most commodious and convenient of their kind in Canada. These works cover an area of about 6,500 square feet, and are divided into forging, spring-fitting, grinding, finishing, wood-working, gear-fitting and shipping departments, which will give employment to about eighty hands. The gear industry is comparatively new to this establishment, but since its inception has developed into an enormous business, they turning out over 2,000 gears a year, consisting of the elliptic end gear, platform wagon, French platform coach and other makes of gears.—*Lumberman.*

MR. JOHN M. GILL is president and general manager of the James Smart Manufacturing Company, Brockville, Ont. The goods manufactured by this concern include stoves of every description, ranges and furnaces, builders' and house-furnishing hardware, lawn mowers and rollers, labor-saving tools for carpenters, blacksmiths and carriage makers, warehouse trucks, jack screws, carriage bands and carriage builders' hardware generally ; cabinet makers' hardware, including castors, bed-fasteners, etc.; hand pumps, kitchen sinks, copying presses, office sundries in brass and iron, and school desks and castings. The buildings cover an area of 350 x 325 feet, well and thoroughly equipped with the best machinery, and employment is given to about 200 hands.

THE Burrell-Johnson Iron Co. have just constructed a steam friction winding engine and boiler for Messrs. Campbell & O'Neil, contractors of the Missing Link. The machine is a combined winder and pile driver, and may be used for anything that can be attached by a belt. It has an upright steel boiler, the engine being a horizontal single cylinder. It has two separate attachments —one for pile driving, the other for hoisting, etc. The engine and boiler are mounted on one frame, so as to be used either on a scow or on land. The hammer weighs 2,100 lbs. The Burrell-Johnson Iron Co. have also completed for the same parties a stone-breaker, 11x15, to be run by the above engine, which also works admirably, and breaks up the hardest rock in fine style.—Yarmouth, N.S., *Herald.*

MR. MCLEOD STEWART, ex-Mayor of Ottawa, who has been in England and on the continent for about a year, has returned to Canada. Mr. Stewart has succeeded in organizing a company called the Pacific Anthracite Company, with a total share and debenture capital of £900,000 sterling to work the Banff coal mines. Two engineers are coming out to visit the Pennsylvania anthracite mines and report on the proper machinery to work the collieries at Banff. It is proposed to bring the output up to 1 500 tons a day Mr. Stewart has also formed a Canadian syndicate with a capital of £20,000 sterling to promote future *bona fide* Canadian enterprises, as well as the Canadian Pacific Prospecting Company, to develop the resources of the Rocky Mountains.

MESSRS. JAMES HALL & Co., proprietors of the Ontario Glove Works, Brockville, Ont., began business in a very modest way in 1865, since which time it has proved phenomenally successful. The main building of the works is of stone, 200 x 80 feet, three stories high. The works are equipped with a 40 horse-power engine and all the latest machinery for the business, including oil mills and finishing machines ; 80 to 100 hands find steady employment ; 150 kinds of goods are manufactured, and include kid, buckskin, calf, imported kid, California tanned deerskin, Napatan buck, etc. Goods from the finest kid to the heaviest buck are manufactured in all the various shades, leathers, leather and silk combined, etc. Patent moccasins, perfect snow excluders, are also manufactured in immense quantities. A fine artotype portrait of Mr. James Hall was published in this journal last year.

THE Ontario Government has almost completed its arrangements to go into the woollen manufacturing business on its own account. As a consequence its support will be withdrawn from the woollen manufacturers of the province and it will enter into active competition with them. Thousands of dollars have hitherto been annually expended by the Government in purchasing prison and jail clothing and the woollen industry has been correspondingly benefited, but the Government has seen fit to change the source of the supply of the goods that are to be required. Preparations are being made at the Central Prison, Toronto, to establish a woollen mill there which will be operated by convicts, under the supervision, it is said, of Mr. P. McKay, a woollen manufacturer. When the Government undertakes to manufacture the clothing required for the Central Prison, every county jail in the province and other institutions under its control, it takes upon itself a work of no small magnitude.

MR. W. H. LAW, proprietor of the Central Bridge Works at Peterboro, Ont., is organizing a company with $50,000 capital for the manufacture of spiral weld tubes and pipes. Regarding this article it is much lighter, stronger and cheaper than ordinary cast iron pipe, and can be made into any length, which will make it available for many purposes. For instance. a six inch steel pipe of this kind will weigh 3 lbs. to the foot and will have a proof strength of 650 lbs. to the square inch, while a cast iron pipe of the same size would weigh 40 lbs. to the foot and would not possess half the strength. The pipe is made and welded in spiral form. That is, the sheet of steel is wound diagonally and the weld runs along the length of the pipe, winding diagonally around it, and no rivets whatever are used. The pipe and the weld is made by machinery, and the pipe can be made of any length at which they can be handled. They make an excellent conduit pipe, and could, on account of their lightness, be used for smoke stacks, telegraph poles and a variety of purposes, to which other pipes are not adapted.

THE Dodge Wood Split Pulley Company, Toronto, report the following recent sales of their patent rope transmissions, all of which can be seen daily in operation : Robt. Gardener & Son, Montreal ; The H. R. Ives Co., Montreal ; Ontario Bolt Works, Toronto ; Augustus Newell & Co., Toronto ; Dartmouth Rope Works, Halifax ; A. W. Morris & Bro., Montreal ; The Jos Simpson Co., Toronto ; J. T. Huber & Co., Berlin ; Warden King & Co., Montreal ; J. Brown & Co., Quebec ; The Beaudry Estate Co , Montreal ; Gananoque Carriage Co., Gananoque ; Pillow, Hersey & Co., Montreal ; Force & Dickenson, Elmwood ; Darling Bros., Montreal ; J. Laurie & Bro., Montreal ; J. & T. Bell, Montreal ; North America Glass Co., Montreal ; The Abattoir Co's, Montreal ; Canadian Edison Manufacturing Co., Sherbrooke ; Doty Engine Works Co., Toronto ; Cumberland Railway & Coal Co., Spring Hill, N.S.; Chas. Boeckh & Son, Toronto. They also report large sales of their celebrated Wood Split Belt Pulleys, which, they say, are rapidly taking the place of iron pulleys in all portions of the country.

THE Albion Iron Works Company, Victoria, B. C., have introduced a plant into their works for the manufacture of bar and structural wrought iron A corrugated iron building has been erected, and steam hammer, boiler and furnaces placed therein. The hammer was made in Leith, Scotland, and has a capacity of twenty-five tons. The boiler is sixty-five horse power. Everything is of the latest design for the work intended. Heretofore all scrap wrought iron from this section of country has been sold in San Francisco, and where there was not time to send to England, bar iron was purchased in the Golden City. The Albion Iron Works will now be able to utilize all this scrap in its new department, and convert it into bar iron. It will also, in the near future, be in a position to construct and erect iron bridges, and it will also be possible to make steamer shafts up to twelve inches in diameter. Up to the present foreigners have always supplied Victoria with these classes of iron work. The eye bars required for the Canadian Pacific Railway bridge across the Fraser river are now being made at the Albion works.

THE large and costly new oil and guano mills just erected on Manicougan shoals. in the Gulf of St Lawrence, by the Manicougan Oil and Guano Company, are ready for operations. The portion of the gulf in which the company is operating literally swarms with porpoises and seals. The company have ordered nets capable of taking at one time sufficient porpoises to produce a thousand barrels of oil. Takes of this kind are by no means unusual in the gulf, a schooner this spring having taken in one catch porpoises that produced no less than 1,400 barrels of oil. By the refining processes adopted by the Manicougan Company the blubber of the porpoise will be converted in the space of half an hour into the ordinary oil of commerce ready for exportation. The remainder will be reduced to pulp, and sold for artificial manure. The fatty part of the head will be submitted to a special process, and the oil thus obtained, and which is similar to that employed for the lubrication of the most delicate mechanism, such as that of clocks and watches, will command the fancy price of $14 per gallon. The promoters of the scheme, of which Colonel W.

Price, of New York, is the manager, are looking for big returns from their investment.

A DEMONSTRATION of the powers of a new machine for the production of horse shoe nails was given in London recently on behalf of Mr. Capewell, the inventor. Each m chine will produce over 600 pounds of average-sized nails in the working day of ten hours, and one boy can fully attend to four machines. The nails themselves are produced direct from the cold steel bar, and are therefore even in temper throughout and uniform, whilst it is claimed for them that in their finish, tensile strength, holding power in chuck, and freedom from liability to fracture under the heads, they are without a rival in the market. Their cost is but little over half that of nails made by other processes. The process itself is very simple. The end of a coil of steel bar or wire on a drum is put into the machine, which, automatically cutting pieces of the required length, passes them down through a series of dies, which draw and bevel them; they are then caught in slots in a revolving plate and pointed, headed and finally dropped—finished nails ready for use—without any hand labor whatever. Should any failure take place in any of these operations with any nail blank, the fault instantly throws the machine out of gear, whilst a danger signal marks the exact spot where it occurs. To remove the faulty blank and restart the machine is the matter of seconds only.—*Ryland's.*

THE Cochrane Roller Mills Company, of Escanaba, Mich., manufacturers of the Cochrane one-belt drive continuous train of rolls, report that they are obliged to run overtime in order to take care of the orders they are receiving. They have their plant in full running order, which includes a complete chill-roll outfit, and they are manufacturing their own chilled rolls. It is the intention of the company to have an exhibit of their train of rolls running at some of the leading expositions this fall. They will have the first one running at the Minneapolis Exposition if the work on hand will permit of their having it ready in time. This train will be composed of five double sets of 9 x 24-inch rolls and two double sets of 9 x 30-inch rolls, making twenty-eight rolls in all. All will be embraced in one frame, and driven from one end by a single leather belt seven inches wide, without the use of tightener pulley. The line shafting, all pulleys, bearings and belting now used in the belted style of mills will also be dispensed with. Should they be unable to have the trains constructed in time for the Minneapolis Exposition, they will surely have one running at the Detroit Exposition.—*American Miller.* This concern had a fine plant at Dundas, Ont., for the manufacture of their machinery. They did not, however, attach sufficient importance to the power of printers' ink as spread on Canadian trade journals, and now that plant is idle and offered for sale.

THE Dominion Safety Boiler Company, Montreal, manufacturers of the Field-Stirling Steam Boiler, have sent us a copy of the New York *World* of May 24th last, in which a full page is given to an account of the investigations made by the proprietors of the *World* regarding the safety and efficiency of steam boilers, with a view to selecting the very best system for introduction into the immense building now being erected by the *World* people in New York City. The requirements insisted upon in this investigation demanded the highest economy under all considerations, simplicity, convenience of access, compactness, quick steaming; constant, steady and general water circulation, steady steam supply, absence of the smoke nuisance, ability to work with bad water or with changes of water, ability to use various kinds of fuel, dry steam, etc. The expert engineers making these investigations examined very closely and carefully into the merits of the Field-Stirling boiler, manufactured by the International Boiler Company of New York City, of which Mr. J. F. Torrance, late of the Dominion Safety Boiler Company, Montreal, is general manager, with the result that an order was placed with the International Company for a battery of six Field-Stirling boilers of 172 h. p. capacity each, aggregating 1,032 h. p. In reporting on this boiler question the *World's* commission say:—"The International Boiler Company have succeeded in attaining the results required, the Field-Stirling boiler possessing all the good points desired, and having none of the objectionable features of other boilers. We are informed by general manager Torrance that this boiler is meeting with such large demand in the United States that his company have determined to start a branch works in Chicago, which will be in operation at an early day."

WELDING BY ELECTRICITY.

AT the recent electrical exhibition at St. John, N.B., the welding of steel and iron is thus described by the St. John *Sun:*

As the work done at the exhibition building is simply that of welding straight bars, wires and pipes end to end, a number of specimens showing a few of the many applications of this process have been sent from the company's factory and are now on exhibition. One specimen which shows several branches of the work to great advantage is an iron frame consisting of two upright bars, one-half inch by one-half inch, and five feet in height. These are welded to bases made of the same size stock and formed by heating the iron in the welding machine and bending while hot. The uprights are bent into a spiral shape in several places by being heated in a pair of clamps, one of which is arranged so that it has a sliding contact and can be revolved by the operator. As soon as the metal reaches the proper temperature the movable clamp is revolved, which immediately gives the iron the spiral form required. An iron rod connects the upper portion of the uprights and is electrically welded to them. To the centre of this connecting rod is brazed a short bar, and to the end of this is welded a two-inch ring, from which specimens of chain and other work may be suspended. A second rod connects the lower portion of the uprights and is welded to them.

Another interesting specimen is a blacksmith's tripod, the three supporting legs of which are all welded to the end of one bar. A branch of the process to which the welding company have recently been giving special attention is that of making chain cables, severa specimens of which are shown. The links of these cables are each made with two welds, one on either side; these are made simultaneously. Two of these links made of one inch stock are shown; also a third link broken in the testing machine by a pull of 64,600 pounds, and at a point 1½ inches from the weld, and in addition to these there are two chains made of mild steel and tested. One of these had the "burr" on the weld entirely moved and broke at the end at a load of 30,570 pounds. The second chain had the "burr" left on and broke at two points 1½ inches from the weld; the actual breaking load was 30,430 pounds. The Welding Co. are now preparing machines for welding studded chains made of two-inch stock; these machines may also be used for the smaller sizes. Two pieces of boiler plate are effectually rivetted by this process. The cold rivets are put through the plates and their ends are held by clamps of the weld, which are so formed that they act as a die to form the rivet heads. The rivets are then heated, and when the right temperature is reached the clamps are pressed together, which upsets the ends of the rivets and forms a perfect head. Eight or ten of these, or even more, may be done at a time.

Work done by this method is so perfect that no caulking whatever is required. A pickaxe having tool steel points welded to the wrought iron stock creates a great deal of interest among tool manufacturers. A simple butt weld is used in this work, so that the great amount of preparation required in making the scarf weld used heretofore is done away with. This same sort of work applies to innumerable other articles, as axes, hammers and many agricultural implements. Among other specimens shown are pieces of shafting 2½ inches in diameter, which required hardly three minutes to weld, large pieces of pipe which show the interior of the welded portion to be as perfect as the original stock; wagon tires, several pieces of forging and shafting, and many specimens of different metals welded together, as iron and steel, iron and brass, iron, German silver, brass and copper, and many others. The machines built by this company are now working successfully in the works of many of the most important manufacturers in the United States.

TORONTO INCANDESCENT ELECTRIC LIGHT COMPANY.

THE Toronto Incandescent Electric Light Company has been organised in this city, and incorporated by the Ontario Government with a capital stock of $250,000, and are now making active preparations for beginning business. The gentlemen interested in this

company had seen and noted the beauty of interior electric illumination in other cities, and felt assured from Toronto's past growth and promise of future expansion, that the time had arrived when public sentiment called for electricity as the most modern and perfect illuminant. The company have obtained a franchise from the city government authorising them to lay an underground service of wires throughout the city, and they have entered into a contract with the Edison General Electric Company of New York, which secures to them in perpetuity the sole right to operate in Toronto the valuable patents owned or controlled by the Edison interests. The Edison Company are backed with an available capital of $12,000,000, and this, together with the able men who are interested in it, signify that the best electrical science and skill that the world has any knowledge of, is available to the Toronto company. The business of manufacturing incandescent electric light is now as stable and far removed from the realm of experiment as is that of manufacturing illuminating gas.

Regarding the safety of the Edison system, its currents are carried from the central station direct into the premises of consumers on safe underground low tension circuits, without any danger to either life or property from fire or electric shocks. When Mr. Edison undertook the problem of furnishing incandescent light, he did so with the resolution that danger to human life should not be a feature of its use, and this he has accomplished.

An ordinary gas burner consuming five cubic feet of gas per hour requires for its sustenance as much oxygen as nine human beings. Human life cannot exist without oxygen, and on the purity of that which we breathe depends our existence. In cold climates severe winters necessitate long periods of closed doors and windows, and it is then when indoor artificial lights are most in use, and the question of pure air is of the utmost importance. If one ordinary gas burner vitiates as much oxygen as nine persons, think of the poison taken into the lungs in a closed house illuminated with many gas burners. The Edison light gives off but little heat, does not vitiate the air, and, though very bright, does not injure the eyes; and for these reasons, apart from many others, it is claimed to be the healthiest method of lighting yet discovered.

Incandescent electric light is more economical than gas, coal oil or candles. The light emitted from an Edison lamp is steady and constant, and therefore a lamp of a given power will give a more desirable light than a gas jet of equivalent intensity. It does not tarnish metals, is not injurious to house plants, does not produce soot or dirt, does not blacken ceilings or decorations, does not destroy the binding of books, and colors are as readily distinguishable by it as by the sun at noonday.

Regarding its convenience Mr. W. S. Howell says:—"As we enter the door we turn a switch close at hand and immediately the hall is lighted; another switch placed in a convenient position at the parlor door controls the chandelier. The dining room is lighted in the same convenient manner, and from the dining room the kitchen lamp is controlled. A switch at the head of the stairway lights the cellar and enables one to go into the coal vaults without a candle and its usual provoking episodes. The lamp over the back porch is serviceable in case of intrusions of man or beast at night, in which event the ever-ready switch casts confusion on the trespasser, and light on his doings, serving as a protection at a very slight cost. Such lamps are of use every night in winter, and are worth many times their cost. Returning to the parlor, we extinguish each lamp as we pass its switch, leaving the rooms behind us in darkness. Wishing to go upstairs, we turn the key of a switch, which lights the lamp in the second story hall, and when we have reached the landing we put out the lamp below by means of a second switch. Inside each bedroom hangs a switch on a flexible cord—press the button and the room is lighted. The cord is long enough to reach the head of the bed, so we hang the switch on a brass hook on the head board, and it is in easy reach from the bed, ready for use at any time of night. As we go out into the hall, we hang the switch on its hook at the side of the door, where we can reach it as we come back, and, pressing the button, the room is dark. So each room is inspected, and the convenience and economy of switches made manifest. The light is in use only when needed."

Another feature of the wonderful system which the genius of Edison has perfected is the fact that power from electric motors can be supplied from the same mains as the electric light. The Edison electric power will do all the work of steam power without noise, coal, heat, dirt, ashes or smoke, and very little attention. The Toronto company will supply electric power in any quantity, from ½ horse-power to 100 horse-power, and will do it at a price that will bring electric motors into general use. These motors occupy but little space, can be started or stopped instantly, and are adapted for every conceivable duty.

Industrial and Trade DIRECTORY.

Acids and Aniline Dyes.

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

DOMINION DYEWOOD AND CHEMICAL CO., Toronto.—Importers and Manufacturers. Chemicals for Cotton, Woollen, Paper and Leather Manufacturers.

McARTHUR, CORNEILLE & CO. (successors to John McArthur & Son), Montreal.—Supply of best quality at closest prices. Every description of coloring materials required by manufacturers of woollens, cottons, silks, paper, leather, &c. Are sole agents in Canada for the celebrated aniline dyes of A. Porrier, Paris.

Agricultural Implements and Parts.

A. S. WHITING MANUFACTURING CO., Cedar Dale, Ont.—Manufacturers of scythes, forks, hoes, etc.

WELLAND VALE MANUFACTURING CO.—Lock No. 2, St. Catharines, Ont., Canada—Manufacturers of axes, scythes, forks, hoes, rakes and edge tools.

THE WHITMAN & BARNES MANUFACTURING CO., St. Catharines, Ont.—Manufacturers of mowing and reaping machine knives, sections, guard plates, cutting apparatus complete, spring keys and cotters, etc.

Bridge Builders.

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

Chemicals and Dye Stuffs.

McARTHUR, CORNEILLE & CO. (successors to John McArthur & Son), Montreal.—Offer at closest figures chemicals required by soap-boilers, oil refiners, paper-makers, and by manufacturers of woollens, cottons, leather, &c.

THEO. H. EATON & SON, Windsor, Ont.; Detroit, U. S. A.—Carry full line of Pure Dyeing Drugs, Dye Woods and Extracts adapted for the requirements of Woollen and Cotton Manufacturers. **Paper Makers' Anilines** and Chemicals Address the **Detroit** Office.

DOMINION DYEWOOD AND CHEMICAL CO., Manufacturers.—Pure Dyewoods, Dyeing Drugs. Sole Agents. English, German, and French Aniline Dyes, for Woolen, Silk, Paper, and Leather manufactures.

Edge Tools, Saws and Hardware.

WELLAND VALE MANUFACTURING CO.—Lock No. 2, St. Catharines, Ontario, Canada. — Manufacturers of axes, scythes, forks, hoes, rakes and edge tools.

H. R. IVES & CO., Montreal. — Hardware manufacturers and founders; iron railing and ornamental iron work a specialty.

Emery Wheels.

PRESCOTT EMERY WHEEL CO., Prescott, Ont.—Manufacturers of emery wheels, grinding and polishing machinery with patent improved cushioned journal bearings, tool grinders with water, twist drill grinders, and other emery wheel machinery.

Gloves.

W. H. STOREY & SON, Acton, Ont.—Manufacturers of fine gloves and mitts in every variety and style.

Hoists and Elevators.

LEITCH & TURNBULL, Canada Elevator Works, cor. Queen and Peter Streets, Hamilton, Ont.—Patent Safety Hydraulic, Hand, and Power Elevators. Telephone connection.

Hubs, Spokes, Handles, Etc.

F. W. HORE & SON, Hamilton, Ont.—Manufacturers of wheels, wheel material, shafts, poles, etc.

COWAN & CO., Galt.—Manufacturers o every description of wood working machinery.

Machine Tools.

JOHN BERTRAM & SONS, Dundas. — Machine tools and wood working machinery. Toronto wareroom, 58 Yonge St. Agents—The Polson Iron Works Co. Montreal wareroom, Craig St. Agents for Quebec—The Machinery Supply Association, Montreal.

Malleable Iron.

THE OSHAWA MALLEABLE IRON CO., Oshawa, Ont.—Manufacturers of malleable iron castings, to order, for all kinds of Agricultural Implements and miscellaneous purposes.

SMITH'S FALLS MALLEABLE IRON WORKS, Smith's Falls, Ont. Manufacturers to order of **refined** malleable iron castings. Agricultural and other castings a specialty. Carriage castings in stock.

Knit Goods.

S. LENNARD & SONS, Dundas.—Manufacturers of plain and fancy hosiery.

Oils.

McARTHUR, CORNEILLE & Co (successors to John McArthur & Son), Montreal.—Afford best value in pure olive and lard oils, also in all other leading lines of vegetable, animal, and mineral oils for factory use. Invite special attention to their celebrated crown diamond "engine" and "machinery" oils.

Paper Manufacturers.

WM. BARBER & BROS., Georgetown—Manufacturer of book and fine papers.

THE TORONTO PAPER MANUFACTURING CO., Cornwall, Ont.—Manufacturers of engine sized superfine papers, white and tinted book papers, blue and cream laid and wove foolscaps, account book, envelope and lithographic papers, etc., etc.

Tanners' Supplies.

THEO. H. EATON & SON, Windsor, Ont.; Detroit, U.S.A.—Supply at lowest prices all Chemicals used by Tanners and Wool Pullers. Special Anilines for Sheep Skin Dyers, Wool Mat Manufacturers, etc., etc. Address correspondence to Head Office, Detroit, Mich.

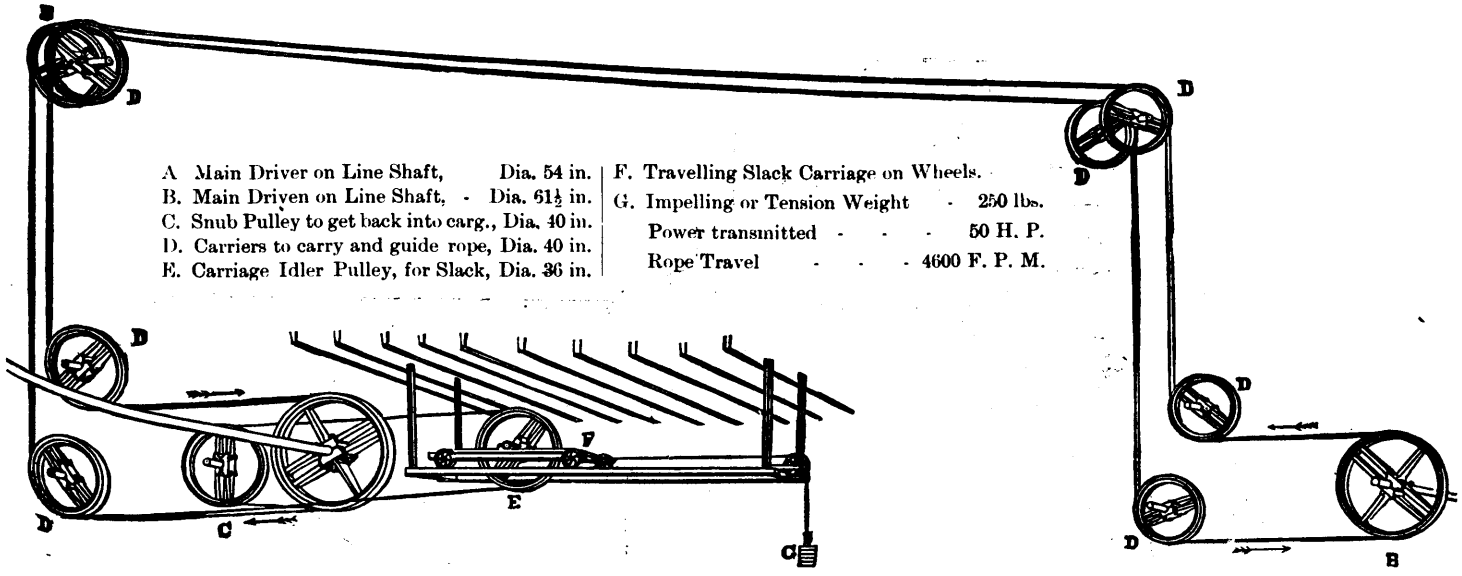
Wire Works

B. GREENING & CO., Hamilton, Ont. — Perforators of zinc, iron and steel; manufacturers of wire cloth all grades, wire ropes, bank and office railings, etc.

TIMOTHY GREENING & SONS, Dundas Ont.—Wire manufacturers and metal perforators, wire cloth all grades, perforated sheet metals of every description, all kinds of special perforating and indenting to order.

Rope Transmission of Power.

PATENTED.



The above illustration shows the Dodge System of transmitting power by manilla rope and grooved hard wood pulleys, as manufactured and erected by Dodge Wood Split Pulley Co., Toronto, and demonstrates fully the practicability of the system. That it may be clearly understood and appreciated, we give the following description:

A transmission similar to the above was erected and started up in September, 1886, and has been running constantly ever since, conveying the power (50 H. P.) to drive a line shaft on the opposite side of the street.

This shaft is on a parallel line with the main line or power end.

In order to avoid obstructing the street it was necessary to go back from the power end and up through the upper stories of the main building over idlers, then across the street into the upper story of the building where the power is to be used, then down again into the lower story, where is located the driven shaft.

The transmission is a very simple one and consists of a series of wood split pulleys, and best quality of tallow laid manilla rope. The power is taken from the main line, making 280 R. P. M. Referring to the Cut, A represents the driver and is 54 inches diameter with two grooves. B, the driven, is 61½ inches diameter with two grooves, located, as stated, in a building on the opposite side of the street, about 125 feet from the driving end. The idlers, D, are of 40 inches diameter, and each has two grooves, and the carriage pulley is 36 inches diameter with one groove.

A journal containing valuable suggestions to those who would apply rope in place of belting for the transmission of power over long distances, with thirty illustrations and much special matter relating to this, the most perfect system ever devised for transmitting the power of a prime mover to distant machinery, sent free on application to the

Dodge Wood Split Pulley Co.

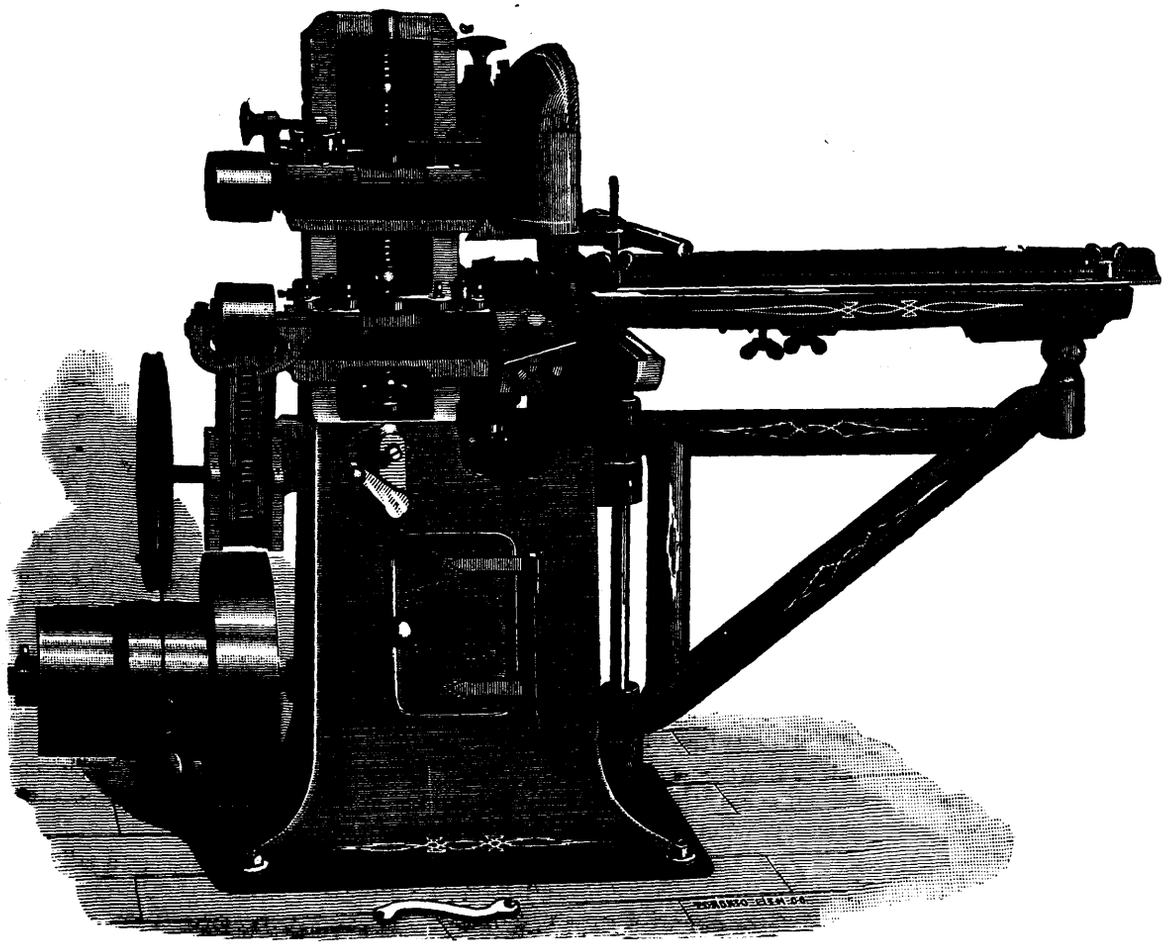
89 Adelaide Street West,

TORONTO, - CANADA.

Belt Pulleys of all diameters and faces made to suit any work, and a large assorted stock constantly on hand.

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 all 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.

COWAN & CO.

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

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

Printed for the Publishers by JAMES MURRAY & Co., 26 and 28 Front Street, Toronto.