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CANADIAN MANUFACTURER AND INDUSTRIAL WORLD

DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

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WORLD'S COLUMBIAN EXPOSITION.

The estimate of the managers of the World's Columbian Exposition at the outset of the Fair was that thirty-five millions of paid admissions would be registered during the six months. This would necessitate an average attendance of nearly 6,000,000 per month. It has not begun to average this up to the present. The paid admissions for May were 1,050,000, for June 2,675,000, and for July 2,760,000. Even if the remaining three months should come up to the original average estimate per month, still would the aggregate not nearly reach 35,000,000 of admissions. The estimate was altogether extravagant, seeing that it is nearly four times that of the actual attendance at Philadelphia in 1876.

The fate of the stockholders, however, has nothing in particular to do with the fate of the Fair. The Fair is a fact accomplished and a great success, let who may suffer by it. Whether the attendance shall be 20,000,000 or 35,000,000 has no bearing upon the great Exhibition itself as a splendid and world-wide show. The vast millions raised and spent there have done their work and the people who visited it will get their dividend whether the stockholders get any or not. For that matter most of the world's fairs thus far held have been held at a loss to the guarantors or stockholders. The Philadelphia Centennial netted a large deficit and so did the two British fairs, as also the Vienna fair. It was the indirect results that compensated those communities for the losses sustained. Chicago must get her dividend in the same way. There are, however, those who say that in a business point of view the Fair has not only been of no benefit to Chicago, but a positive detriment. They point to the ten millions that will probably be lost, (the capital stock and the city subscription), and the countless business ventures that have and will come to grief, including innumerable hotels and boarding-houses, and in addition to a stagnation in real estate that has occurred, and these, they claim, will more than offset any beneficial results, even the immense amount of free advertising that Chicago is getting throughout the four quarters of the earth. This latter they regard as mere cheap and useless glory, and of no account practically to a community that is already in every market of the world with its meats and cereals.

A special feature of Chicago as affected by the Fair is the large number of hotels that have sprung into existence, and this is illustrated by a conversation between a newspaper man and Potter Palmer, proprietor of the Palmer House. Mr. Palmer was being congratulated upon his great run of business, and his admission was that for him at least, the Fair was a good thing. He said that looking simply to the present time, it might be so considered, inasmuch as his house was full to overflowing (two to four in every room), but looking to the future of the business the case presented an entirely different phase. "Look," said he, "at the crop of hotels that has sprung up in this city as a result of the Fair. I do not mean the ephemerals, but the well-built, well-located, and fairly good hotels. They will remain and do business after the Fair is at an end, and they will be competitors with the Palmer House for all time to come. Every hotel, like every man, has some friends, and they must, each and every one, divert some of the traffic of those hotels that, like mine, were already under sufficient competition before the Fair. Except for the Fair we did not need these hotels; but they will hereafter compete actively for the normal hotel business of the city. Hence you see that my present gain, whatever it may turn out to be, may well be considered my ultimate loss."

Real estate men descant in this vein upon a damage to their business, and many of them look upon the fair as a kind of boomerang that has returned to plague them. In 1889-'90 it made business lively. No trouble to sell property up to January, 1891. The course of prices was up and up; everything was screwed up tight to the top notch, and there it was left to await the actual opening of the Fair. And there it is today, awaiting purchasers who do not materialize. The general financial situation of the country and the transitory character of much of the building invoked into life by the Fair weigh now like lead on the market. It doesn't move upward because in the estimation of would-be purchasers there is no margin left for such a move, the natural growth of several years having been anticipated, and it doesn't move downward because as yet holders are hoping against hope that visiting capitalists, enchanted by the glamor at Jackson Park, will be carried away by their enthusiasm and become purchasers. Therefore

they hold on. They would be glad to take the price they could have got in the fall of 1890, but they can't get it now. All around in the neighborhood of the Fair are vacant lots with from two to a half dozen signs of competing agents stuck up here and there on their areas, informing visitors that the property is for sale; and there is a lot that cost the owner $1,500 a few years ago, that he could have sold for $8,000 in 1890, but the opportunity went by unimproved and now exists no more. And this is only a sample of the general situation everywhere within the radius that was set wild by the Fair location. If history shall repeat itself all such property must return to its normal value when the Fair, like the Arabs of the Plaisance, has folded its tents and passed away. Of course the real estate referred to is not going back to the prices of five years ago. Rapid transit extensions all through it and around it will prevent that. The South Side elevated and the cross-town electrics have put a large amount of property on a new basis of value as compared with five years ago. What it must drop is the purely fictitious value conferred by the Fair. That factor has spent its force and there is now a great crop of disappointments to take its place. The $2 a day for a small room that all these new and old householders were going to receive for the six months of the Fair has dropped to $1, and, lower still, to 75 and 50 cents, and still great numbers of them are untenanted. The American people were not so hungry for a World's Fair as these people supposed they would be. They concluded to remain at home and await the dawn of common sense at Chicago, and the event proved that they have saved money by so doing.

The business and financial condition of the country, which gets no better but rather worse, is another and important unsettling influence that militates against the Fair. Any year of all the last twenty years would have been preferable to 1893. It is most unfortunate that after all this preparation in the good years of 1891-'92 the Fair should encounter such an overspread sky as now hangs over the country. With banks suspending all over the West and hard driven elsewhere, and people on the anxious bench about either their money or their employment, it is not to be expected that they will feel like embarking on a pleasure trip to the World's Fair; not at least until they see that the lightning is not going to strike their own houses, and not even then until they see what inducements the railroads are offering. To the masses of the people in the United States reduced expenses mean more than usual this fall.

THE SILVER CRISIS.

THE Business Men's Association of Salt Lake City have addressed to the merchants, manufacturers, and capitalists of the United States a circular which declares that the effort made to "destroy silver as money" has been injurious to the interests of Utah and those of the country at large. It says that owing to this attempt to "destroy silver as money" the value of the wool crop of the Territory has been cut down one-half and thousands of men are out of work. It says further:

"We have thousands of cattle in the Territory and hundreds of thousands of sheep which cannot be marketed. We have magnificent fruit and vast quantities of grain which cannot be marketed because there is no money to either preserve or move crops."

The cattle and sheep of Utah cannot be marketed. Neither can the iron of Pennsylvania and Ohio. Neither can the cotton and woolen goods of New England, New York, and Pennsylvania. Neither can the silks of New Jersey. The products of the States east of the Mississippi, worth a hundred dollars where those of the Rocky Mountain states are worth one, cannot be marketed. The men who want to sell these products but who cannot, do not, however, charge their inability to do so to the movement to repeal the Sherman law, but to the workings of the silver-purchase clause of that law and the agitation for free silver coinage of 50-cent dollars and consequent expulsion of gold money.

It is asserted that there are men out of work in Utah. No doubt of it. But for every one of them there are thousands thrown out of work in the East. A few days ago some great American carpet mills shut down, depriving thousands of men of work. They were not closed because an effort was being made to repeal the bad features of the Sherman law. The works will be closed till Congress has done away with the Sherman law and denied free coinage of silver dollars.

The state of affairs east of the Mississippi being what it is there is no difficulty in understanding why it is so difficult to market the cattle and other products of Utah. The financial policy which the people of that Territory and of adjoining States say must not be changed is the one which has deprived the purchasers of their products of work and thus cut down their purchasing power. "The tail does not wag the dog." The distress in the Rockies is not the cause of the distress in the wealthier and more populous regions which stretch to the Atlantic.

If the people of Utah, Colorado, Montana, Idaho, etc., want prosperity again they will have to wait until the millions east of the Mississippi have secured it. Then, and not till then, will they thrive. The majority of the people know perfectly what is ailing them. It is the dread that the currency will drop from a gold to a silver basis and half their credits will be confiscated. The fact that silver does not sell for as much an ounce as it did twenty years ago has not caused the mischief. It has had no more effect than the fall in the price of cotton last year had. But when it is insisted by the free silverites that because silver, having fallen in price, shall be used as money as if it had not fallen and were still worth $1.29 per ounce, when it is barely worth 70 cents, then the business world takes alarm.

The attempt to repeal the Sherman law is not prompted by a desire to "destroy the use of silver as money," but by a desire to secure the use of silver as money at its real and not at a fictitious value. The more of it there is in circulation at the real value the better. But that is not what the silver miners want. They want to thrust silver into circulation on the theory that 371 grains of it are worth 23¼ grains of gold. The majority of the people say that that shall not be done so long as 371 grains are worth but 12 grains of gold.

The silver miners are getting now for the silver they sell only 12 grains of gold for every 371 of the white metal. If all the silver they produce were made a legal tender at its commercial value, when in bars with a mint mark showing the weight and fineness, they would be much better off than they

are now, and the people would not anticipate with alarm a depreciated currency. Then the silver would take care of itself. It would pass for what it is worth. It would not need to be redeemed in gold as at present. There would be no necessity for gold reserves except to protect the greenback currency of the government. Then the fear that the government would be swamped with silver which it could not maintain at an artificial parity would vanish. Then prosperity would return to the East, and as a consequence to the West and the Rocky Mountain states. By delaying the repeal of the silver purchase clauses of the Sherman law the mining states are protracting their own agony.

GOLD AND GREATNESS.

An American contemporary which advocates the free and unlimited coinage of silver dollars declares that the world, out of much wisdom and experience, adopted gold and silver as primary money; and that the experience the countries are now having that have demonetized silver ought to be enough to convince them that they have made a mistake.

Among the countries which have demonetized silver or ceased to coin it are Great Britain, France, Germany and Austria-Hungary; and we fail to observe wherein they have encountered any experiences which ought to convince them that they had made a mistake. Of course these nations have their financial depressions and exhilarations; but they do not experience any such ups and downs and financial and industrial distress as now weighs like an incubus upon the United States. Austria has recently ceased to regard silver as legal tender, having adopted a monometalic standard, but Austrian banks are not failing nor are Austrian workshops being closed. If Austria has really made a mistake in abandoning silver and is unconscious of the fact, by what process do the American silverites expect to convince that country of it? We know that an unsuccessful effort was made at the recent Brussels conference to do so. Mexico has free silver coinage, but gold is not in circulation there; and the country does not appear to be in the enjoyment of any remarkable degree of financial prosperity. China has free silver coinage, but we do not consider that country to be as progressive as France or Germany or Great Britain; and certainly the United States does not hold up China to be emulated by Europe. The advancement of a country in the arts, sciences, industrial progress and social refinement may be measured by its monetary and financial system; and we can but observe that these countries where bi-metallic standards prevail—China, Mexico, the Central and South American States—are the poorest and most backward in the world; while those countries where gold only is the standard of value, are the richest and most progressive, and stand at the head of the procession in the great march to national greatness.

A CANADIAN ELECTRICAL ENTERPRISE.

Allusion has heretofore been made in these pages to the Niagara Falls Park and River Railway, which extends from Queenston, on the Niagara river, a few miles from lake Ontario, and at the head of navigation at that end of the river, to Chippewa, on the Chippewa river near where it empties into the Niagara river near its connection with lake Erie. Mr. T. C. Martin has written a description of this road and its surroundings, and we are sure our readers will thank us for reproducing the article almost in its entirety. Mr. Martin's description is as follows:

Canada has been quicker than any other part of the British Empire, not excepting the mother country, to appreciate and adopt the electric railway. As far back as 1884, the encouragement given him in the Dominion induced the late Charles J. Van Depoele, a pioneer if ever there was one, to construct a road at Toronto, running out to the Exposition, with conduit contacts: while his road with overhead conductors, in the same city, in 1885, over practically the same route, carried as many as 10,000 passengers a day. Then came the Van Depoele roads at Windsor, Ont., and St. Catherines, Ont., both successful, and the latter to this day using its old platform motors with sprocket wheel connections to the axle, and metallic circuits with overrunning trolleys. When we turn to the roads now in operation and especially to the magnificent road lately equipped and started by Canadian capital and enterprise at Niagara Falls, we realize how crude and faulty the early work was. But without it the art would not have attained its present perfection, nor should we with such hopeful examples as the Niagara road before us be looking forward to the immediate employment of electricity for tractive purposes on long roads to whose operation steam alone has hitherto been considered adequate.

It is true that in her noble water powers, Canada possesses a strong inducement to the transmission and utilization of their energy by means of electricity, but the fact that they had all the resistless Niagara River to draw upon did not save the projectors of the Niagara Falls Park & River Railway Company from a good deal of ridicule and sarcastic comment when their scheme was first brought forward. This scheme was to build a first-class electric trolley road from Queenston, the head of navigation on Lake Ontario, around the Falls and the Rapids, to Chippewa, the foot of navigation on Lake Erie, a distance of about 13 miles. These termini are at this hour, and have been these 50 years, ruined and deserted communities, left aside by the stream of travel flowing in newer channels; and to many people it seemed a well-nigh crazy project to build a road over the ancient "portage" between the two hamlets, and to trust for an income to the chance fares of visitors to the intervening Falls. Despite opposition and criticism, however, the plan was carried out, and its success is a standing monument to farsighted enterprise and engineering skill. Every Canadian who travels over the road is proud to know that it has been built by Dominion capital and operated by his countrymen; that the equipment is practically Canadian throughout, and that the road is not excelled in any respect in either the United States or Europe. So marked is the success of the road, and so obvious now are its possibilities, that ridicule has changed into all kinds of hints as to the ulterior motives of its incorporators, and as to its value as a link between the large railway systems converging at Suspension Bridge. It is an old story. Nothing is more foolish than failure; nothing more astute than success.

* * * * *

The road may be said to begin at Queenston, where it connects with the dock of the Niagara Navigation Company, whose fine line of steamers ply across Lake Ontario to Toronto, about forty miles beyond. The road has no less than thirty-seven per cent. of curve, but the grades are not much

to speak of except at the Queenston end, where five per cent. is encountered in climbing the bluff crowned by the Brock column that memorizes stirring events of the War of 1812. Queenston once left behind, the road follows faithfully every winding of the Niagara river, whose original survey has been clearly adhered to with the object of permitting the visitor to see the rushing waters from every possible point of view. As a matter of fact, the road runs on government property a very considerable portion of its length, and a sum not less than $10,000 per annum is paid for this privilege, which enables the track to be never more than 60 feet from the edge of the cliff. The first thing that strikes an observer is the British solidity and massiveness of the construction. It is regular steam railroad work, and a little more. The track is built with standard 56 lb. steel C.P.R. rail, with angle fish plates, on 8 by 6 inch cedar and tamarack ties spaced 2 to 2 feet 6 inches apart. The guage is 4 feet 8½ inches. The track is ballasted with 18 inches of broken rock, obtained from quarries along the line, and carefully tamped down. Over this track the cars roll as smoothly as balls on a billiard table. The road is 60,040 feet long. Of this distance that part between stations 92 and 180 is equipped with tubular steel poles of 6, 5 and 4 inch sections. The remainder of the line is equipped with 7-inch top cedar poles. The maximum distance between poles is 100 feet. In many cases, on curves, and where the feeders are heavy, near the power house, this distance is reduced to 50 and 40 feet. All the steel poles are set in concrete and the wooden poles are set with a concrete footing and 12 inches of concrete around the base. The work of construction in a stern Canadian winter was not child's play. When it begun during the fierce storms of last January, the heavy snows crusted with frozen spray from the Falls, made it extremely difficult to do anything except study the "ice bridge." In many places, four or five feet of pure ice had to be hewn away before the solid rock could be got at.

The trolley wire throughout is No. 00 B. W. G. hard drawn copper, supported on iron brackets, provision being made for an additional bracket where the line is double tracked. I noticed one or two places where the turnout is on a slight descent and where the cars are allowed to make the detour by gravity, without provision for current supply. The plan works very prettily. All the overhead material is of the Thomas-Houston design, and Lieb clips are used except on curves, where the soldered ear has been found more satisfactory. The rails are bonded with No. 0 B. W. G. wire, and half-inch copper rivets, and cross-bonded every fourth rail. Grounds are made in the river by means of No. 00 copper wire attached to a piece of standard rail, and also many places along the track where facilities offered.

* * * * *

Meantime we have scaled the Queenston escarpment and have made our way out through Brock Park, well along the plateau overlooking the gorge against whose fretted strata of shale and limestone the Niagara River tears and plunges. A beautiful panorama unrolls before the flying car, and every moment a new vista opens through the oaks and firs. The road deserves to be called "the electric scenic route of America." Around Queenston, hitherto remote from the beaten tourist path, we obtain unfamiliar glimpses of forest and chasm, but after passing across the lofty trestle at Bowman's Ravine, territory is reached of which the robber hackman has heretofore allowed us to see something on payment of a heavy feudal toll.

The road traverses ground that is hackneyed in more senses than one, but with the advantage that it brings the visitor nearer than ever before to the scenery of the river, and that the journey is made free from dust and touts. The railroad company have purchased most of the attractions along its route, or arranged with the proprietors for a concession in rates to its passengers stopping over, all of which materially cheapens and simplifies the pleasures of Niagara for the multitude.

When we reach the town of Niagara Falls, the road passes under the railway bridges and thence proceeds, on the very brink of the river, up to the Clifton House, where it enters Queen Victoria Park.

A little higher up at the Horseshoe Falls we come to the handsome stone water power house of the road, with its crenellated towers; and then make a delightful run at the edge of the Upper Rapids, through spray and sunshine, to Cedar and Dufferin Islands, and the Burning Spring Bridge. Here the electric road has a series of three fine iron bridges of its own. The upper portions of the road beyond the Burning Spring bluff overlook the rapids, Goat Island and the cloud of mist rising from the Horseshoe, and afford a distant view of the extensive operations at Port Day, on the American shore, where a few more hairs of the Niagara Gulliver are being pinned down. Just beyond this point are the company's car barns, and thence we glide into the quiet streets of Chippewa, with Buffalo but a few miles away across the smooth and placid water. In about an hour we have made the long portage between the lakes, and have seen all the beauties of that which Father Hennepin described as "a vast and prodigious Cadence of Water."

* * * * *

The electrical equipment of this superb road is entirely the work of the Canadian General Electric Company, of Toronto. The motors, generators, etc., were manufactured at their Peterboro, Ont., shops. The wire was drawn from English copper rods by the Dominion Wire Manufacturing Company, of Montreal, and insulated at Peterboro. The rubber-covered wire used in the power house and in wiring the cars is also the Canadian General Company's wire, known as "C. C." (Canadian Core). The rolling stock equipped consists of four 18-foot ordinary box cars with two W. P. 50 motors; ten open cars measuring 28 feet over all, equipped with two W. P. 50 motors; and ten observation cars measuring 35 feet, mounted on double trucks and equipped with two W. P. 50's. All these motor cars are furnished with controllers of the "E" and "K" type. Besides the motor cars, there are eighteen open and closed trail cars. The work on the motors has been extremely heavy. Thus, ever since the Queen's Birthday (May 24) when the road opened, the motor cars have been run in regular service with a trailer; and the observation cars weigh when loaded about 20 gross tons. A fair load for one of these observation cars is about 110 passengers, with which they would swing up the Queenston five per cent. grade without any sign of strain or effort. No fewer than 17,126 passengers have been carried in one day, and there have been many such tests this season, speaking volumes for the excellence of the apparatus and the shrewdness of the investment. But there has been absolutely no breakdown at all, and I never saw cars that went through their paces better. The neat car bodies are the manufacture of Paterson and Corbin, of St. Catherines. In addition to the cars above mentioned, there is a private car for royalty and editors; and a 20-foot baggage and fruit car will soon be running. The country around for miles is a veritable orchard, and the road will handle large quantities of peaches, grapes, etc., in the near future.

The road is in operation every week day for 15 hours and every Sunday for 12 hours. Cars will run over the whole of the road until the end of October, when the tourist and excursion season ends, and then the outlaying sections will shut down.

A pretty feature of the road through the Victoria Park is the placing at the top of each steel pole, under a hood, of a group of five incandescent lights. The effect of these is particularly pleasing from the American side. The cars are also all lighted electrically and have electric head lights.

Along the line there are eight regular stopping places with raised platforms, but halt is also made on call. There are 20 turn-outs, and I think the heavy travel would be helped if there were more. The management is now looking up the subject of block signalling with a view to the quicker handling of its cars.

The road certainly will stand the load of the heaviest traffic, and the bridges, furnished by the Hamilton Bridge Company, of Hamilton, Ont., have a factor of safety large enough to enable the road to handle railway traffic in the fullest sense of the term. There are three regular bridges, and the Bowman's Ravine trestle, which is 500 feet long and 135 feet high. The bridges, with the exception of Bowman's Ravine trestle, are all above Victoria Park, and across rushing water needing heavy piers One of the bridges has two spans of 150 feet each.

The cars have very heavy 33-inch wheels. They weigh 500 pounds, with 3½-inch tread and 1¼-inch flange. Another feature I observed was the use at one or two points on the road, of cattle guards, which might wisely be adopted in some American city streets, to keep loungers off the tracks.

* * * * *

The power house is a structure well in keeping with the other edifices in Victoria Park, and is of the most solid construction. Here the power of Niagara is used electrically for the first time on the Canadian side, and upon such an extensive scale as to exemplify the results possible when the Niagara region has become, as it undoubtedly will ere long, a great manufacturing centre. The water is led from the rapids just above the Falls, by an unobtrusive flume 200 feet long to the gates, where it is taken in to run two 1,000 h. p. turbines under the head of 62 feet, and then passes out by a tunnel about 600 feet long, to the Horseshoe Falls, under whose gigantic sheet of foam it is discharged, joining the 1,350,000,000 cubic feet of water that pass every minute over that wondrous curve now fast becoming a "V" with acute angle. I cannot say that I note any diminution in the flow over the Horseshoe, due to the power plant, but if it really amounts to anything it may retard the destruction of the beautiful contour of the fall by relieving it of part of the enormous burden now imposed on it. The fate in store for Niagara unassisted by man is to become a long series of rapids, but the relief now promised her should actually preserve and perpetuate her beauty rather than destroy it.

The power house building is 100 feet long by 62 feet wide, and contains ample accommodation for three large turbines. The two already installed drive by means of the main shafting and friction pulleys, three Canadian General Electric "M. P. 200" generators, which represent a total capacity of about 800 h. p. These generators are compounded for 20 per cent. loss, and are connected through three Thomson-Houston generator panels to the feeder board. The connections between the machines are such that they can be run in multiple, or separately at different voltages, so that if found necessary one dynamo can be operated at a higher voltage and connected to the longer feeders. Each feeder is provided with a separate safety catch and amperemeter. The dynamos stand on pier foundations of solid rock, and are absolutely free from vibration. The circuits are led from the machines under the floor to the wall where they are carried up to and out of a window and thence to the pole line.

The turbines are about 45 in. in diameter and are of the Leffel type and are called the "New American." The specification required them to be each capable of developing 1,000 h. p. under 55 feet head of water, and capable of working with any head up to 63 feet. Provision is made at the gates against needle ice, and the construction of the wheel cases, penstocks, draft tubes, gates, gears, standards and pillow blocks is of the most solid and endurable nature. The wheels are geared to give a speed of 250 revolutions per minute on the line shaft.

There is a supplementary steam power house at the Queenston end of the line, containing two Canadian General Electric "M. P. 100" generators belted direct to two Wheelock condensing engines running at 90 revolutions, built by Goldie & McCulloch, of Galt, Ont. This steam plant is only intended for use in the busy summer months when large excursions of 1,000 to 1,500 people are constantly being landed at Queenston from the Toronto steamers, and require to be taken in swarming carloads up the mile and a half of five to six per cent. grade. In ordinary running, this station is shut down, and the trolley and feeder are connected at station 480, so that the whole of the road can be run by the Falls plant. Before this plan was adopted careful studies were made, and it was found that beyond a doubt, in view of the heavy duty exacted by such work, it would be cheaper to install this plant than to transmit sufficient power from the remote main power house to handle the thronged cars on these grades.

* * * * *

The company has a capital stock of $300,000, and the road may be bonded up to $45,000 per mile. It has cost up to date about $600,000. Besides the annual payment to the Government of $10,000, the company had to give a bonus of equal amount before beginning operations. The manager is not satisfied with the traffic from the Canadian cities, although it swamps his carrying capacity even now; and it is expected that in a short time he will be hauling as many people from Buffalo, through Chippewa to Queenston as he now brings through Queenston from Toronto up to Chippewa. It is a natural, easy, and beautiful line of travel, and the most will be made of its opportunities at both ends.

COMMERCIAL ELECTRICITY.

ELECTRICITY, once a plaything, then a scientific study, is now a commercial product. Twenty years ago electrical energy was generated in the laboratory for experimental purposes, by a few physicians as a medicine of somewhat questionable repute, and in weak currents by those who applied it to use in the arts. From the cylinder of glass or mastic, excited by friction to set cork mannikins or pitch balls a-dancing, to the dynamo that runs from one to a dozen powerful engines is a long step, but one that has been taken within the memory of men who still call themselves young.

Electricity as a commercial product, says the New York Sun, is to those who deal in it as commonplace an affair as eggs or butter. The conditions and cost of its production are positively known, and the product may be measured almost as the clerk with his yardstick measures dry goods. You may buy your electricity by specific quantities, and, if you have the conveniences, may carry it home with you as you would carry any other purchase. It can be sent to you by express, or delivered by messenger, or it may be served out over a wire in measured quantity as gas and water are served through pipes. All this seems mysterious to those not technically educated because the electricity shops do not count their product by dozens or measure it by yards and gallons, but use outlandish denominations and a puzzling scientific nomenclature.

Nevertheless, the shopkeepers are at home with the mysterious limber thing in which they deal, and they never stop to think about its mystery, although just beyond the small field which their knowledge covers there lies an unknown area of conjecture.

Electricity as a commercial product and a handy tool, applicable to anything that mechanical power can accomplish, is a thing approximately of only the last ten years. Before that time its cost made it mostly a matter of splendid practical possibilities. Now, with conditions given, a skilled electrician can estimate to a hair the cost of producing the amount of electricity necessary to yield a specified power. It is chiefly a question of the cost of coal.

The existence of two simple laws makes electricity a practical power for doing the world's work. One is that when an

armature is caused to rotate within the magnetic field a current of electricity is excited in the armature, and may be taken up and carried out over a wire and returned to the place of beginning. That is what electricians call the law of the dynamo. The other law is that when a current of electricity is passed through an armature inclosed within the magnetic field the armature is caused to rotate. That is what electricians call the law of the motor. By the first law a current of electricity is set up, and by the second that current is enabled to establish mechanical motion. When these two laws became known the problem of applying electricity to the world's work mainly needed for solution only a cheapening of processes, such as should make it possible to produce a current at commercial rates. Every dynamo, whatever its form, as regards the communication of electrical energy, is essentially an electro-magnet with a core of soft iron, the armature inclosed within the magnetic field, which is the space between the two poles of the electro-magnet. Every motor, whatever its form, is essentially the same thing, with the core revolving under the influence of a current from the dynamo in accordance with the law of the motor. The core of the dynamo revolving under the influence of the magnetic field, is a shaft, the current generated is the belt communicating power to another shaft, the core of the motor. It is this transference of power by the invisible belt from the dynamo, the motor that makes the electric car run, the electric engine revolve or any other mechanism perform its work under the influence of electricity thus generated. The storage battery is simply an isolated reservoir of electrical energy, for the time being independent of the generating source, as if a user of water should prefer to fill a tank in the top of his house once a week rather than to draw from faucets directly connected with the main source of supply.

MOTIVE POWER AT THE WORLD'S FAIR.

THE boiler rooms of the World's Fair contain fifty-two boilers in a row, each of them the exhibit of different manufacturers, but all built in sufficiently uniform style and all standing in line. Their fires are fed with oil, and along in front of them move the men who care for the fuel and increase or diminish the supply. It is a clean place, and even the men and women who know nothing of machinery, or have a special care for power as applied to engines, flock through the wide doorways from machinery hall daily and get their first glimpse of the world's greatest bank of power. The floor in front of the furnaces is tidy all day long. The bright brass and steel ornaments about the fronts of the furnaces are carefully rubbed by the attendants. The men in charge wear uniforms, and present something of the appearance of ocean steamship attendants.

These boilers have a total capacity of 24,000 horse power. They could supply power enough to run all the machinery of all the world's fairs that have ever been held previous to this one. They can turn every wheel on the grounds now and furnish besides the artificial illumination that makes Jackson Park at night one of the most gorgeously beautiful places under the sun. Part of the force generated there is utilized in machinery hall, running the great engines and the numerous dynamos. Part of it is conveyed from the great building to other buildings in different portions of the grounds, and some of the force is transported as simple steam to distant places and there applied to moving machinery.

There are forty-five engines of various sizes and modes of construction in the power plant of the Exposition. Fifteen more are used in line shafts, driving the machinery of exhibitors. Seventeen thousand of the total 24,000 horse power of the place is converted into electrical energy, and demands attention from the visitors in the dynamos of various sizes throughout the grounds. There are, besides, 54,470 electric lights maintained by this same seemingly limitless source of strength. All over the grounds are motors which trace their energy along buried lines to Machinery hall and find at last their impulse in these same great boilers that stretch away in a splendid line down the largest furnace room that ever was constructed.

In a fair which combines so many things to challenge the time and attention of visitors many important items will of necessity be overlooked and forgotten. But in the pauses of visits one might with profit sit down and try to realize the advance made in the getting of power and its transmission to distant machinery. Once the engine and machinery it turned were expected to stand close together. As in the locomotive, we expected to see the wheels which evidenced power almost heated by the steam which produced the power. But at the exposition there are secret passages for the giant that moves the machinery, and he creeps through them unseen and unsuspected to the hidden chamber at the farthest limit of the grounds, and there rises in a might by no means shortened by his removal from the seat of his strength.

And there are other secret passages, more ghostly, even than the first, where the giant of power applied leaps with the swiftness of the lightning bolt, at the turning of a key, and accomplishes in a hundred places at once the miracles of a motion which in other ages could only have been dreamed.

The illustrations of this diffusion of power will multiply as the season advances. In the seclusion of offices, there are beside the desks of the officials, in the parlors of women far away at their building, by the side of exquisite exhibits from foreign countries, the silent but swift revolving little fans that temper the heat and stir the hot air into semblance of zephyrs. However hidden, however far away from the seat of power, there is a line of connection which runs straight from the busy ministers of comfort to the great engines in Machinery hall which furnishes power for all the movement on the ground.

Throughout this big hall machinery is running all the time. There are machines for the manufacture of curious articles to be sold on the grounds. There are great presses, illustrating, as no verbal description could ever illustrate, the making of a metropolitan paper. There are machines from foreign countries artistic in ornamentation and perfect in finish. And there is a whole army of dynamos—that half understood nest of energy which is still to the average man a little of the ogre, a little of the magician. Each of these, and all the myriad other mechanical appliances in motion in the exhibition buildings, and all the tens of thousands of lights derive their power, their energy, their life from the boilers —which are themselves exhibits—located in the long gallery to the south of the main machinery hall.

The intramural railway is provided with power of its own.

This is one of the most stupendous of the Fair's many great features. Over the miles of its railway fifteen trains of four or five cars each are propelled constantly. The engine which drives them is three times as great in power as is the great engine in Machinery hall. The power applied is electrical, generated in the big house of the company at the extreme south-east corner of the grounds—a place not so much visited as its interest merits. Each train of cars is drawn by four motors placed in the foremost car. Each motor is of 100 horse power, so that the total strength of the leading car is equal to that of 400 horse power.

Besides that, the movable sidewalk on the long pier is driven by power from this same great engine. And the electric lights which illuminate the warship Illinois, trace their origin to the tireless energy generated here. The dynamo is the largest ever built. Its construction alone has been one of the problems of the exposition people. The removal of the machinery, when the Fair shall have ended, is another problem which is already clamoring for solution. The mighty balance wheel is thirty feet in diameter. Every feature of the power house seems gigantic. In the first place, there is a battery of ten great boilers. There is one engine of 1,000 horse power, the only one supplied with a belt. All the others are coupled direct. There is a second engine almost equally powerful, a third of 2,000, a fourth of 1,200 and a fifth of 1,000.

Down on Midway Plaisance is the monster Ferris wheel. It commands attention from everyone who visits the Fair. It is like two immense bicycle wheels, set side by side, with room enough to suspend a series of passenger coaches almost as large as those composing a Pullman train. The wheels are supported at their axles on the summits of two towers, each 132 feet high, so that the total height to which a car is carried is 264 feet. The coaches accomodate passengers who secure in the slowly revolving movement of the wheel a fine view of the fair grounds and buildings, the nearer portions of the city and the lake as well.

The engines which drive this immense machine are supplied with steam from a power house located without the grounds. Each engine is of 2,000 horse power. No such gigantic pieces of machinery to be applied to the use of pleasure has ever before been built. The great engines themselves are of the largest, and most perfectly constructed.

AS TO GENERAL ASSIGNMENTS.

It is a well-known principle of law that fraud will vitiate a general assignment for the benefit of creditors, but the trouble is to determine in a given case what is such fraud as will have that effect. Creditors have an interest in the property of their debtors. It has been called an equitable interest; it is the fund to which they look for the payment of the debts, and the law makes it so. Any alienation of property for the purpose of hindering, delaying, or defeating creditors in subjecting the property to the payment of the debts, is fraudulent. So an assignment, ostensibly for the benefit of creditors, but in reality intended to hinder, delay, or defeat them, is fraudulent.

While a person retains the control and possession of his property, whether he is solvent or insolvent, he has the legal right to dispose of it if he does so honestly. But any transfer to put the property beyond the reach of creditors, or to reserve benefits to himself, is fraudulent; hence the vital question is the intention, and this must be determined from all the circumstances. So long as the debtor retains control of his property, he can legally prefer one creditor to another, where by statute preferences in assignments are forbidden. Even if insolvent, he can pay to one the entire indebtedness, to another nothing, and such discrimination is legal.

To vitiate a general assignment, says the Court of Appeals of Colorado, in a case just decided, where these principles have all been affirmed, there must be fraudulent intention followed by irregular and fraudulent disposition of the property, or a failure to convey all. In other words, there must be either a reservation of property, or such a disposition of it that the proceeds will inure in some way to the benefit of the assignor. If made fully and in good faith, it is not only a proper application of assets, but an equitable one, preventing the sequestration and sacrifice of the estate by a few at the expense of the many, and although it may operate to hinder and delay creditors, it is no ground for attachment. The fundamental principles are, that the debtor must devote all his property absolutely to the payment of his debts; reserve no control for himself: must provide for no benefit to himself other than what may result from the payment of his debts; impose no condition upon the right of the creditors to participate in the fund: authorize no delay upon the part of the trustee.

Where a failing debtor makes an assignment purporting to convey all his property for the benefit of creditors, but intentionally witholds a valuable part, the assignment is fraudulent and void as between the assignor and attaching creditors, though the part be withheld for the purpose of applying it to other debts not secured by the assignment, and be actually so applied. But it will be otherwise if the property not mentioned or referred to in the deed of assignment, taken with that reserved therein, is less than the assignor is allowed to hold exempt from execution. The fact that an assignment is made subject to legal exemptions is not a badge of fraud. And the omission of property shown to be valueless is no evidence of fraud. The omission of any large amount of property requires the strongest and clearest proof to establish that it was the result of an honest mistake and not of a fraudulent purpose.

A voluntary assignment, not upon its face fraudulent in law, and containing no provision which raises a presumption of fraud in its execution, may nevertheless be subject to attack before the jury because of some provision in the deed looking to the benefit of the debtor and to the detriment of the creditor, and where no interference of bad faith may be drawn from the instrument itself by testimony outside of it.

The giving of preferences in a general assignment violates no rule of the common law. It is not a hindering, delaying or defrauding of other creditors, as these terms have been uniformly understood and interpreted. In many of the States, however, statutes have been enacted preventing or restricting it under prescribed penalties. Creditors who assent to and affirm an assignment, with knowledge of the facts, cannot assail its validity.

EDITORIAL NOTES.

APROPOS of a statement made recently in connection with the growing uneasiness in the wool manufacturing industry in the United States and the scanty demand for wool, that "many of the looms have been stopped," the New York Tribune has this to say;

"'The looms are stopping' means that thousands of workers begin to trudge from place to place with sad hearts and hungry eyes, knowing that the market for labor is suddenly overcrowded, and yet driven by necessity to fight for a chance to earn daily bread. It means that thousands of families are cast out from comfortable homes, the fruit of honest industry, to live upon charity or not at all. It means that vice and crime gain a terrible purchase and power over the lives of many. It means that souls go down to death, under stress and temptation, which might have been temples of honor and purity and true affection but for the stoppage of the looms. What can be said of the national policy which proposes to stop looms, and close furnaces and factories by the hundreds, in order that somebody may buy things at lower cost? Is it lower cost, if the nation pays the happiness of homes by the thousand, and the honor and purity of many lives, besides the money it sends abroad for goods?"

THE New York Commercial Bulletin (free trade) discusses the procedure by which the new tariff will be created, and eagerly anticipates the date when it may hope to see it in operation. It says:

"In trying to estimate the period the bill will be pending in Congress it is necessary to remember three things. Party discipline is rather more lax on the Democratic side than on the Republican side of the House; the Democrats can hardly turn around and adopt the methods of the Fifty-first Congress to expedite the bill: the Senate rules provide no limit for debate, and a tariff discussion in the Senate has great length and breadth. The Senate, too, may be counted on to make hundreds of amendments in the bill, which will occasion further debate in the House, or will provide ample occupation for a conference committee. Congress has many things to do; it will not lay everything else aside and devote itself to one bill. It is not at all unlikely that under the influence of the Administration a bill to repeal the silver purchase law will be pushed in ahead of the tariff, in which case the conclusion of the latter may be greatly delayed. But even without making much allowance for the silver question, it is very improbable that a tariff bill can be reported or the House before December, or passed by both branches of Congress before April or May."

THE whole business system of the country is so interwoven with the protection of Canadian industry that a blow at protected products means a blow at the prosperity of the country. It means a blow, not at farm and factory only, but at stores, at banks, at railroads, at every form of investment and enterprise. It is as impossible to localize the calamitous effects of free trade, whether in prospect or in operation, as it would be to inflict a dangerous wound in any part of the body without the rest of the body suffering.

"I WANT it to be understood that we take direct issue with the government. The government tell us that the principle of the N.P. they are going to maintain, and we answer to the government that the principle of the N.P. is vicious and must be removed." This declaration by Mr. Laurier, applauded in the recent Liberal convention, leaves no ground for doubt as to the position of the party on the tariff question. It was upon that ground the friends of protection have fought and won many battles; and, the ground being a popular and tenable one, other battles will be fought, and other victories won upon it. Protection is here to stay.

THE Globe becomes sarcastic over what certain Yankee statesmen are doing "to prevent Canadian railroads from carrying American merchandise at cheap rates," and sympathises with the fate of the American people "if Canadians carried their goods for them free of charge." The Globe should not worry this hot weather. Owing to superior advantages Canada can transport freight much cheaper than it can be done on American roads, and will enjoy a fair share of the business notwithstanding the Inter State Law.

AT the recent Ottawa convention Sir Oliver Mowat declared "If it is a glorious thing to die for one's country it is also a glorious thing to live for one's country." Some of his admirers think that a world of progressive thought is compressed in this short sentence; but we can but remember that Mr. Mowat neglected a most excellent opportunity to bestow a great blessing upon Ontario by promising to give a bounty of $2 per ton upon such pig iron as might be made in the province from native ores. Sweet-sounding phrases and suggestions of "progressive thought" are all well enough at times, but what Ontario wanted and did not obtain was the tangible co-operation of Mr. Mowat in building up a pig iron industry.

MORE than half the vessels passing through the Suez Canal are of British register. Score one for the N.P.—Toronto Globe.

More than nine-tenths of the vessels passing through the St. Clair Flats Canal are of American register. Score another for the American N.P.

THE "fly on the wheel" objection is again raised by the organs which affect to believe that the industry and commerce of Canadians require the guidance of N. Clarke Wallace. The people have learned that a fly is far better than a brake on the wheel.—Toronto Globe.

Our free trade statesmen acknowledge that the wheel of commerce will revolve in spite of them, and that their influence to regulate it is as futile as if they were flies on it. That's the sort of statesmen they are. It is well, however, to have brakes upon wheels, and we observe that Mr. Wallace makes a most excellent brakeman. He knows just how and when to perform his duty.

IT affords us much pleasure to note that Mr. Adam Brown, late M.P. for Hamilton, and now Postmaster of that city, has, on the recommendation of Sir Henry Wood, been appointed one of the four British judges for the World's Columbian Fair at Chicago. We are not at this time advised who the other judges are, but the appointment of Mr. Brown is an honor which both the recipient and Canadians generally will appreciate. As Canadian Commissioner to the recent Jamaica Exhibition Mr. Brown was very active and efficient in bringing the great variety of products of Canada there shown to the attention of the world; and his exertions there have been of great benefit to the country. He is a gentleman of extensive and varied learning, and of fine business capacities; and in his capacity of judge at the Chicago Fair no doubt his decisions will be entirely unbiased and give the utmost satisfaction to all concerned.

"One of the evils of the National Policy and the system of protection has been here, as everywhere else, to lower the moral level of public life. It is a subject, however, into which I do not desire to enter at length. I speak of it more in sorrow than in anger; but I tell you this, if you want to purify the political atmosphere of this country, you must revert to the principle that not a cent is to be levied except what is necessary to carry on the legitimate expenses of the government economically administered."—Mr. Laurier, at the Ottawa Convention.

We are exceedingly sorry for the gentleman, for if he continues to live in Canada he will have to submit to the circumstances created by a profound public sentiment that has time and again pronounced in favor of the National Policy.

The fire in the cold storage building of the World's Columbian Exhibition at Chicago has put a stop to the remaining three inspections of 1892 cheese, and this is particularly unfortunate for Canada, as at the judging of cheese which has already taken place she had practically carried off all the prizes. These three inspections were to have taken place on July 10 (which was about commencing when the fire took place), September 10 and October 10. Fortunately the May make of cheese for 1893, was placed in the pyramid in connection with the dairy trophy for Canada, and thus escaped. For both the years 1892 and 1893 there were 135 medals offered, and of those Canada, it will be remembered, took 131, Quebec securing 52 medals, Ontario 73 and the Maritime Provinces 7. But in the competition for the May make of cheese, the province of Quebec carried all before it. Canada took every one of the 21 medals offered. Quebec took 20 of these, leaving the other one to Ontario. The 20 medals secured by Quebec were all taken by the counties of Brome and Missisquoi, Brome getting 18 and Missisquoi 2. The highest point made in butter was 99 out of a possible 100, and this was dairy butter from the county of Brome. The Province of Quebec took 12 outof the 13 medals taken by Canada for butter, Brome county alone securing 8 medals.—Montreal Star.

Signor Balsamello, the inventor of the "Balla Nautica," the sub-marine vessel which with several successful experiments were performed lately at Civita Vecchia, in the presence of a commission appointed by the Government, it is reported, declares that by the aid of his invention he can float Her Majesty's ship Victoria at a cost of less than £40,000. He believes that with the Balla Nautica he can make arrangements for raising weights far exceeding that of the sunken ironclad. The preparations and placing of grapnels and chains round the Victoria would probably take a month, and would be performed by the crew of the sub-marine ship, which has already descended, it is said, to and been manœuvred successfully at depths beyond that in which the Victoria lies.

Wheat and wool are selling in the United States at the lowest price in the history of the trade. This is attributed to the expectations of a change in the tariff according to the declaration of the platform which elected a Democratic president and congressmen at the election in November last. Tariff changes should not be of too sweeping a nature, and our farmers should bear this in mind. While they naturally enough look to what concerns themselves most, and disregard the claim of others, they should remember that the object of all tariff changes should be to secure the greatest good for the greatest number. Could that principle be so indoctrinated into the people of Canada as to make it paramount, the result would be beneficial to the people as a whole and to the country generally.—The Shareholder.

The Hamilton Spectator says that there are some purposes for which gasoline is superior to gunpowder, and blowing up cook stoves is one of them. We are acquainted with a party who will give a big silver dollar for each well-authenticated instance of the blowing up of cook stoves by gasoline. The location of the events is not restricted to Canada, or the United States either, but to the whole world. A dollar apiece for each and every cook stove ever blown up by gasoline. The Spectator should either become wealthy or cease talking nonsense.

A new valve worked by electricity from any point desired has been invented. It is designed especially for application to steam engines, but can be used to shut off water, gas, etc., as well. When applied to a steam engine it is placed on the supply pipe near the throttle, and connected by electric wires to any part of a factory, so that one push of the button instantly closes the valve and stops the engine. The principle upon which the valve is worked is that of utilizing the steam pressure in the pipe as the motive power to work the valve after being released by the electric current. The valve consists of a piston enclosed in a shell in the form of a cross, and directly across the steam way through the supply pipe. When open it gives direct passage for steam and stands in equilibrium with the steam on both sides. Consequently it does not move, but on the electric current being applied a small exhaust valve is opened at one end, throwing the valve out of equilibrium, moving the piston and the shut-off valve directly athwart the steam way, and closing it, thus stopping the steam supply. It is very simple in construction and is not liable to get out of order, and does its work perfectly.

There is distress among the iron miners in the Lake Superior districts on the American side. Such is the result of all encouraged industries. People are taxed that men and capital may be taken from self-supporting employments and turned toward the production of goods for which there is no profitable demand. Such folly must bring its natural results.—Toronto Globe.

Under the influence of judicious protection the iron industry in the United States long since passed the period when the people might have been taxed to support it. Under protection the United States has become a greater iron-producing country than even Great Britain; and under protection the per capita consumption of iron is greater in the United States than in any other country in the world. And what nonsense for the Globe to suggest that there is no profitable demand in the United States for iron produced under the influence of protection. Under the influence of protection a demand for iron has grown up in the United States which requires the production of nearly ten million tons per year; and the Globe knows that if the production of the article there were not profitable it would not be carried on. It is so profitable and so successful that Canada, who has no iron industry, can purchase from the United States quite as cheap, or cheaper, than from free trade Britain. We know that there is widespread and general suffering in the Lake Superior iron districts which

is said to be worse than in the black days of 1872, but this is not a result of protection, but because of a dread that the tariff reform government of the United States will destroy protection. There is no class of people in that country but feel the pressure of this dread and suffer because of it.

Mr. Hague, General Manager of the Merchants' Bank, in his recent annual address made the following instructive remarks upon the conditions of business success now-a-days, placing the chief responsibility for diminishing mercantile failures upon the banks. He says: "Experience shows that it is more and more difficult to carry on business successfully. There was a time when almost anybody could make money either out of farming or any other pursuit. In these days it is impossible to succeed without a practical knowledge of business, close application, the adoption of all new methods and appliances, and the exercise of sound judgment and self-restraint in giving credit. The banks, as a whole, hold the purse-strings of the supply of money for mercantile purposes, and all my experience points to this conclusion that they have it in their power to do much to promote mercantile success or failure. I verily believe, looking back over the varied events of thirty years' management in Toronto and Montreal, that if the banks generally came to a good understanding among themselves as to the manner in which they would lend money, the rules they would adopt about the security for it, and as to limitation in amounts according to the circumstances of borrowers, the number and amount of the failures that occur year by year might be diminished one-half. I put this on record as my deliberate opinion, and would be glad if due note were taken of it. What benefit would arise from this you can readily imagine. I, for one, would be well pleased to see it."

A distinguished American, galvanized into a Turk who now supports the name of Muhammed Alexander Russell Webb, having become actively interested in Mohammedanism has returned to the country of his birth and is doing what he can to convert the Christian infidels to the true faith. He is making some converts in his missionary work, and we are told that quite a large number of people in the United States, imitating Mr. Muhammed Webb, are provided with regulation prayer rugs upon which they kneel while at their devotions. It is our opinion that the carpet manufacturers of Philadelphia are at the bottom of this religious movement, their object being to create a furore for prayer rugs. Mr. Muhammed Webb shows a beautiful assortment of them, but as he cannot conveniently dispense with any of them, being an exceedingly pious man, and as the McKinley tariff does not allow the free importation of prayer rugs, the carpet manufacturers are sedulously cultivating a boom in Mohammedanism with a view to a large demand for the prayer rugs which they expect to supply. Canada will not be outdone in this direction, for we are advised that at least one of our carpet manufacturers has recently been to Chicago to inspect the prayer rugs on exhibition there with a view to producing the article in his Toronto factory. As will be noticed in an item which appeared in our Captains of Industry department, the Toronto Carpet Manufacturing Company, of which Mr. James P. Murray is president, have enlarged their premises and introduced considerable new machinery. It is probable that when Mr. Muhammed Alexander Russell Webb starts a class in Mohammedanism in Toronto he will find a good supply of home-made prayer rugs ready to his knees.

The Mugwump newspapers of this country are much of a kind. They are much too holy to support the wicked Government except at election times. They are forever assuring the world that they would be most happy to support the Liberals if the latter would only make it possible for them to do so. But there is always something which repels them: it is the personality of some leader or sub-leader, or it is the advocacy of some policy which they don't like, or the non-advocacy of some fad which they are enamored of; but there is always some excuse for them to continue their hypocritical attitudinizing as the only virtuous and sensible people in Canada. When the battle trumpet blows, they all throw aside their robes of pristine purity, and, taking the shilling, excel the straightout Tory journals in their exceeding eagerness to libel the Liberals, and ensure the continuance of the reign of the Haggarts, Carons, Cochranes and other Conservative statesmen. Such, with scarcely any exception, has been the course in the past of the "independent" newspapers, and so they will continue to be in the future.—Montreal Herald.

Our esteemed contemporary resembles the one only good man on the jury who complained of the stubbornness of the eleven who would not agree with him. No doubt there are what the Herald calls "Mugwump" newspapers that strive to have incongruities in the administration of the Government corrected, but they want the correcting to be done by the true friends of Canada, not by its enemies. Hence the tears of the Herald.

The tendency of the National Policy and a high tariff is avowedly to restrict the volume of imports: if not, then it fails of its purpose. Restriction of the volume of imports means less freights and earnings for vessels coming to Canada and therefore increased charges on the freights exported. As these export freights are mainly agricultural, dairy and forest products, the burden of increased freight falls upon the farmers and lumbermen directly. By the encouragement of reciprocal international trade freight charges whether by land or water would be reduced and the profits of the farmers and lumbermen thereby increased.—Moncton Transcript.

Canadian export trade in cattle has been temporarily stopped by the doubling of ocean freight rates on Allan steamships. In all future cases when subsidies are given to steamship owners the people should secure control over freight and passenger rates.—Toronto Globe.

Never since the National Policy came into existence has the foreign trade of Canada been less in any year than in the year preceding it, and this refutes the contention of the Transcript that the tendency of the National Policy is to restrict the trade. It should be remembered that the ambition of the Government and of the country is not primarily to build up a foreign trade, either by importing foreign merchandise or exporting domestic products, but to encourage the development of such diversified industries as the country may be capable of maintaining to advantage. Of what use would it be to the country to import an article that we can produce at home; or what benefit would it be to export products that the country ought to consume. Foreign trade, therefore, is not a primary object, but an incidental one. It should be to bring to us the products of other countries which we cannot ourselves produce, or cannot produce to advantage, and to take to foreign countries such of our products as we cannot consume at home. As in the case of the steamships alluded to by the Globe, the more beef we can consume at home the

less we would have to export; and it is clear that if we had larger capacity to consume, the higher the home price of beef would be, without reference to foreign markets.

During 1892, 3,559 vessels of all nationalities passed through the Suez canal, 2,581 of which, or 72 per cent., were British, and but two American. There were also two Chinese and two Egyptian vessels that passed through.

Sir Oliver Mowat, binder twine manufacturer, has great advantages over his competitors in the same line. His employes are forced to work as many hours as he pleases; they get no holidays; they cannot strike for higher wages or shop regulations; they must take the food he gives them, and they work for nothing. Under these circumstances, Monopolist Mowat should be able to sell his twine cheaply. But he doesn't. He charges as much for it by the carload as other makers charge by the pound, and his twine is of an inferior quality. There doesn't seem to be any remedy for this sort of monopoly short of paying a bonus on American twine. The N. P. and Monopolist Mowat are a bad pair.—Hamilton Spectator.

The penny-in-the-slot machine has, during the last few years, been adapted to so many different purposes, and has become so popular, that its origin, which has been heretofore more or less enveloped in obscurity, is a question of considerable interest. While the originator of this money-making device will probably remain enveloped in doubt, it is universally considered to be of English origin. The first slot machine a writer in an American contemporary ever saw was, he explains, in the store of a London tobacconist in the year 1867. He believes that this was the first one manufactured, for the contrivance was not only then looked upon as a decided novelty, but the mechanism was so crude and primitive that in view of the state of perfection to which it has now attained there could be little doubt of its recent origin. The device, he explains, consisted of a little brass box, resembling in appearance the old-fashioned tea caddies our grandmothers used to employ. The box was partitioned off in the middle, and had two half covers which were fastened at each end of the box, and were operated by means of springs. The cover of one compartment was provided with a raised slot and a thumb knob. When you put a coin in the slot and pressed the knob, the cover of the other compartment would fly open. The idea of the machine was to put a penny in the slot and get a pipeful of tobacco. At first thought it would look as if the tobacconist had all the best of the bargain, adds the writer, but the machine was so crude that he had only his own watchfulness to save him from imposition. Not only would any coin open the box, but any object shaped like one, and as the tobacco in the opposite compartment was in a loose state, an unprincipled person could as easily take a handful as fill his pipe. This machine did not, however, meet with any lasting success, and it was many years after that the slot machine, as we of the present day know it, put in an appearance. But there can be little doubt, according to the views of the author, that this device, which has made several fortunes, can trace its origin back a quarter of a century to the crude contrivances then seen in the shops of the London tobacconists. Therefore, to England not only belongs the credit of originating but of developing the slot machine, and it has apparently been adapted to the use of quadrupeds as well as bipeds, for we learn in the Manchester Zoo, if the visitor now gives one of the elephants a penny, he immediately drops it in the slot of one of these machines and gets a biscuit.

A company has recently been incorporated in the United States to manufacture a telegraphic printing instrument recently patented there, and which it is claimed, will not only supercede the telephone as at present employed, but will revolutionise telegraphy in general. In appearance the instrument resembles an ordinary typewriter surmounted by a glass case containing electric machinery. It is operated by simply pressing the keys. Every instrument is both a transmitter and a receiver. Each key when depressed sets a small ratchet wheel in revolution, and each tooth of the wheel makes an electrical contact, causing the transmission of a current through the circuit. The currents used alternate, and each wheel excites a definite number. At the receiving instrument a similar wheel to that operated on responds to the number of currents so excited, and to no other number, thus insuring accuracy of signaling. The message struck upon the keys of the transmitter is printed upon a sheet of paper by the receiver, and this is done without necessitating the presence of an operator at the receiving end. The receiving instrument may in fact be in a locked box, if privacy be desired. No tapping of the wires between two such instruments is possible, it is said, as the electric vibrations caused by the depressions of the keys do not correspond to any code of signaling in use, and their rapidity is too great to permit of counting. It is not intended that any instruments shall be sold except to telegraph companies or railroads. One of the company, in describing the use of the instrument, says: "When our system gets into use it will never be necessary to use the voice. The pressure of a button will call up central, as in the telephone system, but it will do more, as it will register the number of the subscriber who calls. When the clerk at the central station is ready to connect an inquiry will be sent to the caller, who will in reply print the number of the subscriber he wishes to communicate with. The clerk will then make the connection and the message can be transmitted and registered whether the recipient be present at the moment or not. There will be no need to shout one's self hoarse trying to make central understand what is wanted nor to take the population of a building into your confidence as to the private matter you wish to discuss with your correspondent. The telegraphic printer insures not only strict accuracy but secrecy as well. On railways the use of this instrument will facilitate both particular and general messages. Every instrument on a line can register a communication intended to be general, or, if only one station is to hear it, a signal to that effect can cause all the rest to disconnect. Similarly in the transmission of news items it will be possible for a central agency by a single operation to send out a perfect copy of each item to every newspaper office in direct connection with it, irrespective of number or distance. As to the speed of transmission it will be simply a question of the speed of the typewriter who sends out the message. As fast as the keys of the transmitter can move those of the receivers, no matter how few or how many, will respond."

THE Globe tells us that a free democratic convention, such as that of the free trade party recently assembled at Ottawa, at which no cut-and-dried resolutions are placed before the delegates, is what wins the confidence of the party. But the resolutions passed at that convention were cut-and-dried long before the convention assembled, and nothing that any speaker orated about at that time had any effect whatever in passing or in retarding the passage of the resolutions. The convention was called purposely to endorse a platform of hostility to the National Policy.

"LET it be well understood," said Mr. Laurier at the Ottawa convention, "that from this moment we have a distinct issue with the party in power. Their ideal is protection; our ideal is free trade. Their immediate object is protection; ours a tariff for revenue, and for revenue only." The issue is well stated, and the people, who are the arbiters, will decide it. Protection is here to stay.

THE Illinois Central Railway Company seems to have devised a practical plan of profit-sharing. Employees will be encouraged to invest their surplus earnings in stocks at the market quotations, payments of not less than $5 being accepted, and interest paid on them at 4 per cent. When the payments reach the value of a share a certificate of stock will be issued, and the holder will be entitled to whatever dividends are declared. Of course the stock can be sold in the market at any time. And every employee will be allowed to withdraw on demand the payments made on a share with interest. This plan has been previously advanced by railway companies whose stock was of doubtful value, but this is not the condition of the Illinois Central. Nearly all alleged profit-sharing schemes heretofore devised have been either charitable donations by generous employers or tempting and uncertain promises to induce men to work for low wages. The Illinois Central Railway Company seems to have devised a fair plan on business principles.—Toronto Globe.

The Globe never misses an opportunity to have a mean fling at manufacturers and other employers of labor. If it were posted on what is going on in the world it would know that profit-sharing is no new thing, having been in successful operation for perhaps fifty years. There are quite a number of Canadian manufacturing concerns where the system is practised with great and satisfactory success—satisfactory to employe as well as employer, and where it is in no way affected by the question of high or low wages.

AN electric car going up the steep hill called Windsor street yesterday lost its brake power and slid down hill until it came into collision with a horse car, knocking one of the horses down. The fortunate or unfortunate presence of the horse car on this occasion leaves it still a matter of doubt what will happen when control of one of these electric cars on a steep grade is absolutely lost.—Montreal Star.

THE Empire is emphatically proud of the fact that local paving firms have been able to tender lower than a Detroit company. But that is dangerous ground. It leads to the belief that our encouraged element could do likewise if people were permitted to buy manufactured articles to the best advantage. But of course the encouraged would be obliged to accept smaller profits and to incidentally lessen party contributions.—Toronto Globe.

The Globe is mistaken in its conclusion. Under free trade the foreign manufacturers would invade our market, and, being possessed of larger capital, would sell his products at prices far below their intrinsic value until such time as he could drive his Canadian competitor out of business, dissipating his capital and driving his workmen to seek employment in other occupations. Then, having removed this obstacle to his success, and having captured the Canadian market, he would have it in his power to raise his prices, thus recouping himself for what he had previously sacrificed, and, having the market within his control, skin it to the extent of his opportunity and ability.

IN a recent issue allusion was made to a new Canadian industry where what is known as jewelers' sweepings are refined and the pure metal recovered therefrom. These sweepings are obtained from the floors of workshops where gold and silver jewelry are made, and from photograph galleries; and it is by the refining process that the precious metals contained in what would otherwise be valueless waste is recovered. As an illustration of this matter we read in a San Francisco paper of the fact that a few days ago a thick woolen carpet that had been on the floor of the coiner's room in the mint in that city for seven years was taken up and carefully cremated. The precious ashes were scrupulously gathered together, and by an elaborate refining process the Government recovered 279 ounces of gold, worth over $5,500. The metal had been deposited there by the infinitesimal abrasions and disintegrations of the yellow metal while being converted from bullion into coin. Even the heavy gloves of the men who handle bullion are incinerated, and the gold is brought back to coffers. Even the smoke from the furnaces used for melting the metal is made to redeliver the treasure with which it is trying to escape, and from the soot in the chimney cunning little bars of the yellow stuff are secured.

AN important test of nickel steel armor plates was recently made in Washington, the result being that a contract was awarded by the United States Government to the Carnegie Company for some seven hundred tons of plate for armoring the monitor Monadnock It is said that the cost of combining the nickel with the steel in these plates is only $11 20 a ton, while in similar plates, made in France, the cost is $140 a ton. The contract price for the American plates is $575 a ton. From these figures it is evident that any concern that can manufacture nickel steel armor plates, and can obtain a contract to make a considerable quantity of them at the price indicated, ought to realize exceedingly large profits. The nickel that goes into the construction of these American plates is all obtained in Canada, and all that we have to show for the output is the hole in the ground from which it is taken. We are free to send our nickel ore to the United States where it is refined and is the chief article of value in armor plates for which $575 a ton is paid; but if we should attempt to do the refining in Canada, exporting the refined nickel to the United States, we are confronted at the boundary line with a tariff duty of $200 per ton. Since the disaster to the Victoria in the Mediterranean Sea it is probable that nickel steel plates will be used exclusively in armoring war ships; and as the world's greatest known deposits of nickel are in Canada, it is evident that this country would be wonderfully benefited by the possession if we imposed an export duty on the product. The Dominion Government have it in their hands to influence tariff-legislation of the United States in favor of this country by this means. Will they do it? Impose the duty.

The Globe says that the organs that are enthusiastic over the blessings in store for the payers of iron bonuses have overlooked the fact that it would be desirable to sell the iron and steel after it had been produced. Without any pretence of being an organ, this journal has steadily advocated the payment of a bounty by the Ontario Government for the production of iron in this province made from native ores. And it has also repeatedly pointed out that even if such an industry were established it could not possibly be successful unless the the Dominion Government amended the tariff in a manner that would compel the consumption of all the iron that might be made in Canada. The pig iron industry can never be made successful in this country until a prohibitive duty is placed on scrap iron. With such a duty there would be a demand for every ton of iron that we might produce.

For a number of years Wide Awake, a monthly magazine specially devoted to the entertainment of young people, published by the D. Lothrop Company, Boston, Mass., has been a most welcome visitor to this office. It has been so regular in its visits, and so entertaining in what it has had to say, that it became a dear familiar friend, our sentiment toward it being "Happy to meet; sorry to part; happy to meet again." But now since Mr. Lothrop, the founder of Wide Awake, has passed into the Great Beyond, the publishers, having other important matters in hand, have transferred our interesting contemporary into the care and keeping of that other great and deservedly popular magazine St. Nicholas, with which it has been merged, and hereafter the spirit and enthusiasm and delightful instruction that has made Wide Awake what it was will glow and scintillate and shine as brightly as ever in St. Nicholas. And when we tell our readers that Tennyson, George Macdonald, William Howitt, Mrs. Oliphant, Lewis Carroll, the author of "Alice in Wonderland," and many others of our most delightful of British authors: and Bryant, Longfellow, Whittier, Stedman and a host of others of the best American poets and writers have been or are contributors to St. Nicholas, we know that those of them who are not already acquainted with it will take pleasure in transferring their affections to it. St. Nicholas is published by the Century Co., 33 East 17th Street, New York.

REVOLUTION IN ELECTRIC HEATING.

In the United States consular reports for June are advices concerning a discovery in the use of electricity for heating purposes, which if in simplicity of method and potency of action as thereby announced, is a clean cut advance in practical electricity. The discovery is attributed to the experiments of two Belgian scientists, who recently applied to the German patent office for patents on a new method of heating, melting and refining metals by means of electrical heat. It was determined before granting the patents to make a practical demonstration of the process. The matter was referred to a disinterested electrical expert at Berlin who announced the process a brilliant success. The apparatus as described consists of a glass or porcelain vase, which may be of any size conveniently adapted to the purpose, provided with a lining of lead connected with a strong conductor of positive electricity. The vase is filled to three-fourths its capacity with acidified water. A pair of iron tongs with isolated handles is attached by a flexible conductor to the negative pole of an electric current generated by an ordinary dynamo. With this simple and comparatively inexpensive equipment the results as claimed are obtained. The current being switched on, a bar of wrought iron or other metal is taken up with the tongs and plunged into the water in the vase. The water begins to boil at the point of contact, and the immersed portion of the iron rises to a red, then to a white, heat, emitting a stream of brilliant white light. In but a short time the iron melts and falls off in bubbles and sparks, the heating process being so rapid that neither the water nor the end of the bar held in the tongs are more than slightly warmed, and the current being switched off, the bar, with its submerged end glowing, may be readily held in the naked hand. In the experiments at Berlin it was estimated that fully 50 per cent. of the current was directly utilized, whereas the practical limit of such utility is said not to have hitherto exceeded 20 per cent. The explanation of the process lies in the application of the well-known law that resistance to the passage of an electrical current causes heat. The current passing through the tongs and metallic bar into the water decomposes the latter into its two gaseous elements, oxygen and hydrogen. The oxygen is attracted and gathered on the relatively large surface of the lead lining, producing no noticeable results. The hydrogen, on the other hand, gathers around the immersed portion of the iron bar, which is immediately enclosed with a jacket of hydrogen, which, being a bad conductor of electricity, creates a resistance to the passage of the current, thus developing the heat causing the submerged bar to glow and melt.

This discovery or process if as reported is as yet in too early a stage to define its practical range, or its real commercial value. As far as experiments have so far been made, in the welding of certain metals the success in that direction is said to promise a revolution in methods. The difficulties at present existing in the electrical welding of metals, such as the government of the electrical furnace, and the disadvantages of impurities in metal are said to be overcome by the newly-discovered process. It is further stated that the new method may lead to important results in the hardening and tempering of armor plates and other products of iron and soft steel in which great resistance to penetration or abrasion by friction is required, while preserving the interior tough and fibrous to resist concussion or strain, as in many parts of machinery. Krupp & Co., of Essen, Germany, are experimenting with the new process in the hardening of steel cannon, while this method of producing an intense heat and easily regulated temperature opens up some hitherto impossible achievements in chemistry, as in the production of precious stones by crystallized carbon.

In this, as in the early announcements of all discoveries, there may be much of anticipation to be qualified by actual results, but there can be no question that the facts as reported indicate an interesting deployment of electrical science and research.

SOME THINGS EMPLOYEES DO NOT SHARE.

It was about this time last year that certain United States Senators and others who undertook to divide between the right and the wrong of the Homestead struggle, were discoursing on the "co-relative ownership" of employees in the works at which they were employed. The idea conveyed, as far as it was evolved from

the somewhat misty rhetoric employed, was that employees have at least a right to employment in the works in which they have regularly toiled, and under certain circumstances the right to take those works into custody, for the purpose of preventing other workmen from entering to take their places. There is also at the base of the profit-sharing proposition, something of the idea of partnership between the capital invested in a manufacturing plant and the labor employed by it. Somehow there has grown up in latter-day thinking on the relation of employer and employed, the idea that something more than his wage is the due of the wage-worker. With the authors of the "co-relative ownership" notion of the summer of '92, this something beyond the workman's wage was the right to employment as long as he wanted it; with the advocates of profit-sharing it is a certain proportion of the net earnings of the employing industry.

We have been waiting, in these weeks of strain and anxiety to employing capital, to hear from the advocates of these special benefits to employees, some suggestions of reciprocal obligations. We have heard none of them proposing that employees with comfortable savings bank accounts—and it will be remembered that many of the Homestead strikers were extensive property holders and note-holders—should come to the help of employers, who with abundant gilt-edged securities to offer, were racked with anxiety about pay rolls and bills payable, because the usual sources of money were cut off. It has been taken as a matter of course that a money stringency and all the uncertainties and losses that come with it, are among the things in which employers have an exclusive property. And this is a correct view. Management and proprietorship can have no exemption from the strain of a stringent money market; from the anxieties attending large unsettled balances against firms whose condition is shaky; from the competition of men who do not expect to pay their debts and who have little or nothing to lose by making suicidal prices; from the operation of laws made by men who count manufacturers, especially protected manufacturers, as so many tariff robbers; from the influence of forces which the employer has no power to control, and that may seriously depreciate values on which he has relied for continued solvency.

Times like the present demonstrate all too forcibly what are the risks of industrial investments, and emphasize, in a way that none but those who have known both conditions can understand, the difference in mental stress, in all that is apart from the performance of a stint, between wage-earner and wage-payer. Many a man has gone from one condition to the other, and as the responsibilities of an employer have come to be fully realized with enlarging experience, has no doubt wondered at the general prevalence among wage-earners of the notion that the investment of capital in manufacturing means as a matter of course, profits, sure and large. The profit-sharing idea goes on the assumption that there will be profits to share. In short, the element of catastrophe in business has altogether too little consideration from those who are given to showing on paper how much in excess of their just share in the partnership of capital and labor, employing capitalists are wont to get.

Perhaps the trials that have beset so many business enterprises of late will find some slight compensation in one particular at least. They may make a new impression on minds that have hitherto failed to recognize that the responsibilities and burdens and risks of industrial capital are no less real than the profits that come to a fraction of it.—Iron Trade Review.

Inventions.

CANADIAN PATENTS.

The following patents have been issued from the Canadian Patent Office, from July 25 to August 8, 1893, inclusive.

Information in regard to any of these patents may be had free on application to THE CANADIAN MANUFACTURER, or copies of American patents corresponding to these, where the American patent has been previously granted, can be procured through us for the sum of twenty-five cents.

MECHANICAL.

43,726 Automatically taking and indicating soundings for purposes of navigation and also for hydrographical, topographical, geological and like purposes, N. Potschnisky, July 25th.
43,727 Curtain fixture, N. W. Stearns and G. E. Bonney, July 25th.
43,729 Nut and bolt lock, L. R. Blumstengel, July 25th.
43,730 Self countersinking screw. C. K. Whittier, July 25th.
43,731 Fuel feeding device, G. H. Cotton, July 25th.
43,732 Coin controlled apparatus, W. Boardman, July 25th.
43,733 Pneumatic tire, J. F. Palmer, July 25th.
43,734 Pneumatic tire, J. F. Palmer, July 25th.
43,735 Pneumatic tire, J. F. Palmer, July 25th.
43,736 Hose coupling, E. E. Gold, July 25th.
43,737 Convertible stills and cookers, J. Cook, July 25th.
43,738 Winter velocipede, J. F. Zalsman, July 25th.
43,739 Expansion valve for engine, H. Gohler, July 26th.
43,740 Check rein detatching or attaching device, H. P. Kyes, July 26th.
43,741 Saw, J. S. Yallace, July 26th.
43,742 Heating and cooling liquids, F. A. Kleemann, July 26th.
43,744 Vehicle spring, B. S. Van Tuyl, July 26th.
43,745 Pocket ticket case, A. Allen et al, July 26th.
43,746 Dust guard for hubs, J. T. Richards, July 26th.
43,747 Combined flour and meal sifter, A. Brooks, July 26th.
43,748 Opening shutters, C. J. Sandberg, July 26th.
43,749 Metal fence, G. D. Hamilton, July 26th.
43,750 Refrigerating apparatus, M. Wanner, July 26th.
43,751 Refrigerating apparatus, M. Wanner, July 26th.
43,752 Wardrobe bedstead, H. Waddell, July 26th.
43,753 Vending machine, D. I. Caldwell, July 26th.
43,754 Extension table, The Warren Extension Table Co., July 27th.
43,756 Car coupling, S. C. Sams and L. D. Sweet, July 27th.
43,757 Printing on matches, S. Bud et al, July 27th.
43,758 Engine operated by the explosion of combustible mixtures, R. Homsby & Sons (Ltd.), July 27th.
43,759 Gas and petroleum engine, L. Sabatier et al, July 27th.
43,760 Clips for holding paper, S. H. Wright, July 27th.
43,761 Adding machine, B. H. Phillips, July 27th.
43,762 Puzzle, J. Kinviey, July 27th.
3,763 Chipping glass, S. Evans et al, July 27th.
43,764 Preparing for and ornamenting of clear glass, S. Evans et al, July 27th.
43,765 Relating to signs, etc., C. de Borman and C. Alker, July 27th.
43,766 Hydrant, A. Gravel, July 28th.
43,767 Gas lighting and extinquishing apparatus, J. Sangster, July 28th.
43,768 Changeable signs and labels, C. A. Gildermeyer, July 28th.
43,769 Receiving written messages, orders or the like, F. W. Schafer, July 28th.
43,770 Belt fastener, D. Pasztor, July 29th.
43,771 Producing cement, V. F. L. Smidth, July 29th.
43,772 Furnace, J. Roberts, July 29th.
43,773 Forming horseshoe or horseshoe blank, J. Roberts, July 29th.
43,774 Fare box, W. O. K. Ross and E. L. Guaedinger July 29th.
43,775 Animal trap, J. V. Poahs, July 29th.
43,776 Rubber boot, B. A. Pickering, et al, July 29th.
43,777 Submarine boat, J. R. Haydon, July 29th.
43,778 Letter press and lithographic cylinder printing machine, C. C. Butterfield, July 29th.
43,779 Ladder or similar structure, W. E. Richard, July 29th.
43,780 Loom, J. W. Cheeney, July 29th.
43,782 Salve, A. Boyer, July 31st.
43,783 Printer' galley, W. T. Near and D. J. Deegan, July 31st.
43,784 Hollow wheel or roller, E. G. Hoffmann, July 31st.
43,786 Trunk fastener, J. L. Jones, July 31st.
43,787 Cistern cleaner, F. Overton and J. Faught, July 31st.
43,788 Grip wire fence tool, S. S. Casey et al, July 31st.
43,789 Self threading needle, N. H. Piffard, July 31st.
43,790 Grinding, smoothing and polishing plate or sheet glass, G. A. Marsh, Jr., August 1st.
43,791 Water closet, A. O'Brien, August 1st.

43,792 Gas, C. L. Fitch, August 1st.
43,793 Tobacco flavoring machine, J. M. King, August 1st.
43,794 Merchandise exhibiting rack, W. High, August 1st.
43,795 Explosive engine, H. W. Williams, August 1st.
43,796 Explosive engine, H. W. Williams, August 1st.
43,797 Explosive engine, H. W. Williams, August 1st.
43,798 Cartridge shell, C. E. Overbaugh, August 1st.
43,799 Automatic weighing machine, H. E. Smyser, August 1st.
43,800 Automatic weighing machine, H. E. Smyser, August 1st.
43,801 Cash register, Boennermann, August 1st.
43,802 Separation of gold from its chloride solution, J. W. Sutton, August 1st.
43,803 Inhaler, H. D. Cushman, August 1st.
43,804 Barrel, J. Dozier, August 2nd.
43,805 Petroleum fluid burner, H. Bragg and W. Backus, Jr., August 2nd.
43,806 Cleaning dried fruits, J. H. Bell, August 2nd.
43,807 Stopping leaks in ships and boats, N. M. S. Douglass, August 2nd.
43,808 Chain-tool mortising machine, C. Loetscher, August 2nd.
43,809 Tool for exchanging percussion caps in empty cartridge cases, N. G. Hanson, August 2nd.
43,810 Boiler, J. R. Brownell, August 2nd.
43,811 Road bridge, J. J. Price and R. Grafton, August 2nd.
43,812 Damper, T. Davidson, August 3rd.
43,813 Hydraulic dredge, C. H. Booth, August 3rd.
43,814 Ventilating railway carriages, S. Hughes, August 3rd.
43,815 Ventilating caps, H. Bradley, Jr., and J. V. Adams, August 3rd.
43,816 Furnace tap, E. P. Mathewson, August 3rd.
43,818 Balanced slide valve, E. B. Sintzenich, August 3rd.
43,819 Door plate, W. W. Owen, August 3.
43,820 Burnisher, T. Lloyd, August 3rd.
43,821 Stop cock, J. C. McNabb, August 3rd.
43,822 Steam pump, C. H. Booth, August 3rd.
43,823 Lithographers' and printers' roller, F. Horsell, August 3rd.
43,824 Steam engine, G. H. Warring and O. B. White, August 4th.
43,825 Combined step ladder and bench. E. B. Stebbins, August 4th.
43,826 Sewer trap, R. Newton, August 4th.
43,827 Pulley block, J. L. Pope, August 4th.
43,828 Washing machine, E. G. Minnemeyer, August 4th.
43,829 Washing machine, J. Heselwood, August 4th.
43,830 Steam washing machine, J. Heselwood, August 4th.
43,831 Insecticide, J. Brown, August 4th.
43,832 Burglar proof safe, W. Corless, August 4th.
43,833 Axle lubricator, J. S. Patten, August 4th.
43,834 Building blocks or bricks, G. E. Briggs, August 4th.
43,835 Carrier package, F. M. Peck, August 4th.
43,836 Unbreakable angle mould, R. J. Hoidge, August 4th.
33,837 Preservative drier for use with varnishes, oils and the like, F. G. Hojer, August 4th.
43,838 Washing machine, J. L. Sprague, August 5th.

13,839 Fountain Pen, W. A. Leary, August 5th.
13,840 Cartridge loading machine, E. S. Rice, August 5th.
13,841 Converting oscillatory into reciprocating motion, J. L. Morrison in trust, August 5th.
13,842 Paper feeding machine, J. L. Morrison in trust, August 5th.
13,843 Respirator or inhaler, W. W. Houlder, August 5th.
13,844 Dredge, J. Canan, August 5th.
13,845 Repeating and continuous firing magazine, fire arms, Firm of Gebrinder Schonberger, August 7th.
13,846 Waste trap, C. H. Muckenden, August 7th.
13,847 Button, H. M. Nester, August 7th.
13,848 Gear for driving small machines such as are used for sheep shearing purposes, H. Bland, August 7th.
13,849 Advertising, F. Obbinson, August 7th.
13,850 Train covery block system, E. A. Winterhalder, August 7th.
13,851 Steam or air connection for water elevators, The Automatic Water Tank Co., August 7th.
43,852 Tyre for the wheels of bicycles, R. R. Gubbins and G. Harcourt, August 7th.
43,853, Potato planter, J. P. Davenport, August 7th.
43,854 Construction of fireproof and ventilating floors, ceilings and roofs, M. Fawcett et al, August 7th.
43,855 Monkey-wrench, E. S. Pratt, August 7th.
43,856 Straightening misshaped legs, H. Bayer, August 7th.
43,857 Cutting green corn from the cob, Sprague Mnfg. Co., August 7th.
43,858 Saw handle, R. S. Carr, August 8th.

ELECTRICAL.

43,728 Electrical protective system, W. S. Hull, July 25th.
43,743 Independent electric clock, P. A. Jenkins, July 26th.
43,755 Storage heaters, etc., for street cars, Consolidated Car Heating Co., July 27th.
43,781 Incandescent lamp socket, G. G. Lafayette, July 29th.
43,785 Electric heater, E. P. Wetmore, July 31st.

SCIENTIFIC PROCESSES.

43,817 Process of embalming, T. Martin, August 3rd.

CHAMPION CHAIN PIPE WRENCH.

THE accompanying illustrations are of the Champion Chain Pipe Wrench, manufactured by Greene, Tweed & Co., 83 Chambers street, New York City. It is intended for gripping, turning or holding pipe, bolts, shafts, or round surfaces from one-eighth to 14 inches diameter.

Fig. 1 shows the inside construction of the wrench and the manner of fastening it together, the large link at the end of the chain being strengthened to allow for the extra wear of the chain swinging from the centre. Fig. 2 shows the wrench in operation. It is made entirely of best steel, the jaws being hardened to a tool temper. All the parts are interchangeable, and duplicates can always be readily obtained from the makers.

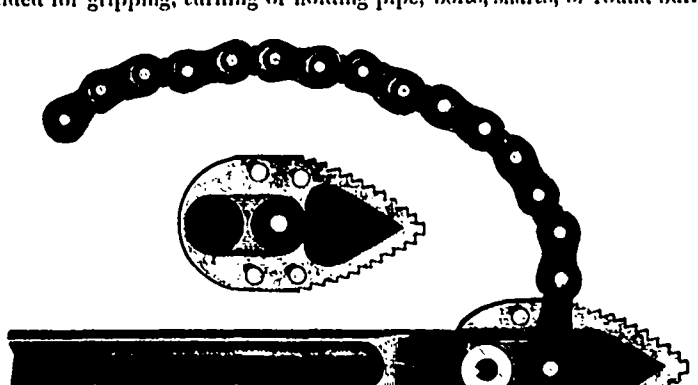

FIG. 1.

The advantages claimed for the Champion over other chain pipe wrenches, are:

First.—They are equally proportioned throughout, giving them great strength and durability, with the least possible weight. The handle will not bend, the teeth are especially designed for this style of wrench, and great care is taken in tempering them.

Second.—The pins or projection on jaws, which the chain hooks onto, are more than strong enough to bear all strain, and the drop forged hook, which comprises the outside link of chain, is amply strong, and the hooking strain of chain is brought to bear on the patent link and not on the rivet, thus giving a strong, positive and easy hooking chain.

Third.—The rivet which secures the chain to the wrench is larger than any other rivet in the chain, and the link is also larger, giving it a chance to wear as the chain swings from this, and consequently has a greater wear. The chain, when wrapped around the pipe, starts at a right angle from the wrench, and all the pull comes on this pin, making a rear support of no use.

Fourth.—The chain hanging in the centre allows it to swing both ways, making it a double wrench, and whichever way the operator puts it on it is right side up, always ready for use without changing, giving both sides equal wear from the beginning, making it much more durable.

Fifth.—The handle is secured to the wrench in a novel and strong manner. The cylinder projection on the handle head and recesses in the jaws give it twice the bearing surface in the same given space. This is necessary as the wrench is used first one side, then the other, and if secured in the old way the handle would soon become loose. The handle and jaws are rivetted together by the same rivet that secures the chain, doing away with projecting screw heads, which are very much in the way when used against flat surfaces. The wrench is easily taken apart by removing the pin, and each part is interchangeable, so that if any part breaks it can be replaced.

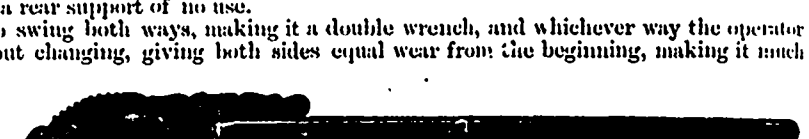

FIG. 2.

The following tests of the strength of chains of Champion chain wrenches were made at the Cornell University, Ithaca, N.Y.:

Chain of No. 0 Wrench stood 3,300 lbs. tensile strain.
" No. 1 " " 5,400 " "
" No. 2 " " 8,500 " "
Chain of No. 3 Wrench stood 12,200 lbs. tensile strain.
" No. 4 " " 16,000 " "

Further information may be had of Messrs. Greene, Tweed & Co.

Captains of Industry.

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.

THE St. Thomas Gas Company, St. Thomas, Ont., will install another 90 h.p. Reliance generator.

THE Toronto Board of Trade have installed a Ball incandescent dynamo in their building.

MESSRS. SMITH BROS., carriage makers, Toronto, have placed a 15 h.p. Ball electric motor in their factory.

THE Oriental Steam Laundry, Toronto, have installed a 20 h.p. Ball electric motor.

THE Peoples' Mills, Guelph, Ont., are making alterations and adding new machinery.

MR. J. T. GORDON will erect a large grain elevator at Pilot Mound, Man.

A NEW railway scheme is projected in Quebec. The town council of Joliette have taken steps towards the granting of a $25,000 bonus, to aid in the construction of a road between their town and the city of Quebec.

MESSRS. JACKSON BROS., of Toronto, have severed their connection with the Peerless Manufacturing Company and intend starting a factory at St. Catherines, Ont., for the manufacture of mowers.

IT is understood that Mr. Charles L. Bailey, of Toronto, has purchased and will operate the saw works of the R. H. Smith Co. at St. Catherines, Ont.

THE factory of the Clinton Organ Co. at Clinton, Ont., was destroyed by fire August 10th; loss about $10,000.

THE Chaudiere Electric Light Co., Ottawa, have placed an order with Messrs. Goldie & McCullough Co., of Galt, Ont., for two tandem compound wheelock engines of 600 h.p. each, and six steam boilers with a capacity aggregating 1,300 h.p., for use in the auxiliary steam station which the Chaudiere company are about building. This new station will have one of the tallest chimneys in Canada. It will be 120 feet. This extreme height is a safeguard against flying sparks, the station being in the immediate neighborhood of the lumber piles. Scientists say that a spark from pine wood carried up a chimney to the height of 80 feet loses its power for mischief, and the company is going to erect its chimney 40 feet higher still in order to make assurance doubly sure.

EXPORTERS to the West Indies will be glad to know that in future there will be no wharfage charges in Jamaica on through goods shipped from inland points via Halifax and Pickford & Black steamers.

THE saw-mill of Messrs. Sewers & Thompson, at Turner's Station, near Port Elgin, Ont., was destroyed by fire August 5th, loss about $4,000.

THE E. B. Eddy Manufacturing Company, Hull, Que., are preparing to build another paper mill. In the extensive equipment of the Eddy Company at Hull, there are already two large mills in operation.

THE American Hardwood Company is being incorporated at Ottawa with a capital stock of $100,000, to manufacture different kinds of wood to resemble or imitate walnut wood.

THE flax mill of Messrs. Weir & Weir, at St. Mary's, Ont., was destroyed by fire August 8th, loss about $3,000.

THE electric light station of the St. Mary's Electric Light Company, St. Mary's, Ont., was destroyed by fire August 8th, loss about $3,500.

WILSON'S Lead Smelting Works at Hamilton, Ont., were destroyed by fire August 8th, loss about $8,000.

MR. ELLIS, St. Francis, Que., is building a new sawmill. The engine, boiler and machinery were purchased in Brantford, Ont., from the Canada Machinery and Supply Co.

THE Richelieu & Ontario Navigation Co. will run a new line of steamers between Montreal, Hamilton and intermediate points. The new steamer Magnet, now building at Sorel, Que., will be put on the route when finished, on or about Sept. 1st.

IT was stated in the last issue of this journal that a consignment of 200 tons of crude asphalt had been made to the Sicily Asphaltum Paving Company of Montreal, from Mazzarilli, Sicily. The quantity was 2,050 tons.

MR. J. J. DE GROOT, Consul of the Netherlands to Hayti, and a member of a large business firm in that island, while recently in Halifax, N. S., chartered six vessels to carry brick from the Nova Scotia kilns to Hayti.

WALKER & CARSON propose erecting a flour and oatmeal mill at Carman, Man., with a capacity of 200 barrels of flour and 75 of oatmeal. They ask a bonus of $7,000, and a municipal bylaw will probably be submitted upon the bonus question.

THE Bradley Fertilizer Co., Boston, Mass., present a very attractive card in another page, in which allusion is made to their Griffin Mill, which they say is the only perfect pulverizer, being specially adapted to the pulverization of qu rtz, gold and silver ores, plumbago, Portland cement, phosphate rock, foundry facings and all other refractory substances. It will work either wet or dry, and deliver a finished product. Capacity, 3 to 4 tons per hour on phosphate rock, 1½ to 2 tons per hour on Portland cement, quartz or ores, depending on hardness of material to be pulverized and fineness of product. It grinds from 30 to 250 Mesh with equal facility. It is described as having no journals in grinding chamber. Ball rigid on shaft, having direct positive action on material. Minimum power produces maximum amount of product. It is absolutely guaranteed in every respect, both as to construction and capacity. First cost, wear and operating expense much less than stamp mills. Large number of mills in use on different materials with positive success in every instance.

THE grain elevator at Wapella, Man., was destroyed by fire August 1st, with all the contents.

Mr. A. Ellis is building a new saw-mill plant at St. Francis, Que.

J. W. Williams, of London, Ont., is interested in a proposed new tannery at Portage la Prairie, Man.

John Murphy is building a new salmon saltery at South Westminster, B. C.

Abner Smith is making extensive improvements at his tannery at Sackville, N. S.

An electric light plant will be established at New Westminster, B. C.

James Rosseau & Co.'s recently burned tannery at New Westminster, B. C., will be rebuilt immediately.

The Canada Colored Cotton Mills Co. is making many improvements about its plant at Hamilton, Ont.

A Scotch manufacturing company may establish a woollen-mill at Mission City, B. C.

The recently burned Seeley saw mill at Greenwich, N. B., will be rebuilt immediately.

The Napanee (Ont.) Soap Works Company is extensively enlarging its plant.

Churchill & Burton will construct a large office for the Yarmouth (N. S.) Water Works Company.

A. Dubois & Co. will establish the manufacture of boots and shoes at Montreal, Can.

The canal to connect Lakes St. Clair and Erie will soon be in course of construction. The syndicate has headquarters in Detroit, Mich.

The Port Colborne (Ont.) Smelting Company will construct another furnace at its plant.

The electric apparatus designed by Mr. Thomas Monro, C. E., of Ottawa, for operating lock gates was tried a few days ago at lock No. 4 of the Beauharnois Canal. It proved a success, the gates being easily opened and closed in about one minute. This will greatly reduce the cost of labor on the canals.

An Order in Council has been passed authorizing a contract to be entered into between the Post Office Department and the Ottawa Electric Street Railway Company for the conveyance of the mails between the city post office and the railway stations. The contract has been made and the railway company will commence the work as soon as preparations can be made.

The water works system at Nanaimo, B. C., is undergoing extensive improvements.

The C. P. R is building a 2,000 feet extension to their wharf at Vancouver, B. C. The stone work will cost $30,000.

The people of Revelstoke, B. C., are talking of electric light for their town.

No. 4 shaft of the Wellington mines, Wellington, B. C., which was flooded some time ago, has been pumped out and will shortly be operated again.

Messrs. H. H. Spicer & Co. shingle manufacturers, False Creek, B.C., near Vancouver, recently made a shipment of a train load, 15 cars, containing 2,500,000 shingles, to points east of the Rocky Mountains. This is said to be the first complete train load of shingles sent east from Vancouver.

Messrs. Gardner Bros., Essex, Ont., have recently been making large shipments of axe-handles to Sudbury, Ont.

Formerly, the lacquer used as varnish for the tins of the British Columbia canneries, has been imported from the United States, but is now manufactured in the province, and half of the total quantity used this year will be of home manufacture.

The Canadian Colored Cotton Mill Co., have recently equipped their Cornwall mill, with the Eco Magneto Watchman's Clock, manufactured by the Eco Magneto Clock Co., 620 Atlantic Avenue, Boston, Mass.

The Penberthy Injector Co., Detroit, Mich., are issuing a neat little brochure, the first number of which has reached this office, and in its salutatory it says:—"We have come to stay. On the first of each month hereafter we shall visit you, bringing such items in regard to our business as we think will be of general interest, advising you of changes and improvements and of any new specialties which we may decide to place on the market. Items of a lighter character will not be wanting, and we hope our monthly visits will not be unwelcome. We will not ask for the most prominent place on your literary table, but only that we be not relegated to the waste basket until you have at least glanced through our pages, which we hope to be able to make of some interest to you."

The first shipment of iron ore has been made from the Arisaig iron mines at Arisaig, N.S. There were 20 tons of the ore, and and it was sent to the furnaces at Ferrona, about 1,000 tons being ready for shipment from the mines. The seam from which this iron ore was taken was discovered last spring in a gulch between two mountains, about three miles from the wharf at Arisaig. The seam is from six to eight feet wide, and is easily worked, owing to the fact that it runs up the whole length of the side of one of the mountains, having only a few inches of earth over it. The ore is said to be probably the best grade of iron ore ever discovered in eastern Nova Scotia. From 40 to 50 tons are daily taken from this seam at present, and it is said when proper carrying facilities are afforded, 500 tons can easily be delivered every day.

The Breithaupt Leather Company will erect a three and a-half story building, 40 x 84 feet, at Listowel, to take the place of the one recently destroyed by fire.

The City Council of Calgary, N. W. T., is calling for tenders for lighting the town by electric light for a period of one to five years. Tenders must state the yearly price per light, per 20 and 50 arc lights of 1,200 c.p. each, all night service, and also the price per light for any additional number required by Council.

Messrs. Longnecker & Morris, of Harrisburg, Pa., were in Kingston, Ont., a few days ago, where they bought 250 tons of iron ore from the Wilson mine, Calabogie, for the Pennsylvania Steel Company. The assay of the ore has been highly satisfactory, and if it stands the furnace test, Mr. Longnecker says the company he represents will work iron ore mines in that district on an extensive scale, provided transportation does not cost too much. He has secured 4,000 acres of iron ore property, and, if everything turns out satisfactory there will be a boom in the business in the Kingston and Belleville districts. The Pennsylvania Steel Company have leased the Wilson mine at Calabogie, and opened a new iron ore mine at Coe Hill. There are twenty-five men working at this latter place, and a cargo of ore will be shipped to Central Pennsylvania in a few days.

Hon. M. Monroe has started a new mode of salmon packing, which if it turns out satisfactory, will revolutionize the whole future trade in this fish. The idea is to so pack them that they will keep perfectly fresh for three weeks at least, so that they can be placed on the London market practically the same as when they came out of the water. The process is not by cold storage or refrigerator as might be supposed, the *modus operandi* being entirely different. The plan is to remove by pressure all the preserving gases inherent in the fish, after which a prepared fluid is injected, which permeates the entire fish, acting as a preserver. The fluid is innocious, and rather enhances the flavor of the fish than otherwise. Mr. Monroe put a dozen salmon and some codfish through the process a few days since, but he will not ship any before ascertaining if they will turn out all right or not. When fifteen or twenty days will have gone by the fish will be taken out and their condition tested. If they will be as fresh as it is anticipated, the business of packing will begin in earnest.—St. John's, New Foundland, Trade Review.

One of the most interesting exhibits in the machinery hall at the World's Columbian Exhibition at Chicago is a combined fish plate punch and shear, manufactured and shown by Messrs John Bertram & Sons, of Dundas, Ont. The housings are cast solid being 10 inches thick at the front and extending back 78 inches; they are cast separately, planed and bolted together with 3 inch bolts. The housings extend below the foundation like an arch to give solidity to the gap. The machine is steam driven by an attached engine with cylinder 14 x 14 inches, and regulating governor. The power is communicated from the engine shaft to the ram by a set of heavy multiple gearing, the last of the series being 9½ inch face and 3½ inch pitch, the wheel and pinion being shrouded to the pitch lines. The eccentric shaft is a hammered steel forging 20 inches diameter at the wheel bearing; the eccentrics are forged solid on the shaft and have a diameter of 15 inches with 5 inch stroke. The two connecting toggles are socketed in top of ram slide with a bearing 6 inches diameter and 10 inches long, and are held in place by steel straps. On the bottom of slide the shear or punch blocks are bolted as required. The shear blades are 57 inches long and 1¼ inches thick, and will shear 1 inch plate. The punch blocks are steel and planed for the reception of punches and dies at any point. The machine will punch 6 holes 1¼ x ¾ inches at one stroke, the number of strokes being 12 per minute. The ram can be stopped by a lever and steel-faced clutch on the intermediate shaft. The intermediate shaft is steel, 8 inches diameter, and the engine shaft is 6 inches, steel. The machine will shear scrap plate 18 inches wide and crop same any length, as there is a clear opening throughout between the housings. The weight is 65,000 pounds; speed of engine 150 revolutions per minute.

Mr. James Rousseau's tannery at New Westminister, B.C., which was burnt in July, is being rebuilt.

The machinery for the sampling works at Kalso, B.C., is being placed in position, and crushing will be commenced in a few days.

Messrs. Nie & Lynch, machinery manufacturers and engine builders, of Hamilton, Ont., has been dissolved. Mr. Lynch retires, and the firm will be continued under the style of Nie & Whitfield.

The Eco Magneto Clock Co., 620 Atlantic Avenue, Boston, are equipping the Dominion Cotton Mill Co.'s mill at Magog, Que., with a thirty station Watchman's Clock. When completed, this will be the finest watch clock system in Canada.

The Windsor Patent Brush Company, Windsor, Ont., request us to state, that they have secured temporary quarters in the old furniture factory at Sandwich, and are now making brushes, whisks and brooms. The building secured, is fitted up with 35 h. p. boiler and engine and wood-working machinery necessary in their business. There will be very little delay in filling any orders they may be favored with.

The municipality of Puerto Principi, Cuba, have put in an electric light plant. The whole plant, which consists of two 750 light alternating dynamos, with lamps, sockets, transformers, and everything necessary for a complete electric light plant, were purchased from the Royal Electric Company of Montreal. A commercial company in Port au Spain, Isle of Trinidad, are also negotiating with the Royal Electric Company for an electric plant similar to this.

We hope to be able to record shortly, the first engineering success on the Assiniboine river by the completion of the dam at Millwood. The turbine wheel has not yet been put into its place and proved the efficiency of the power, but there seems no doubt of its ability to run the flour and saw mills. The dam was constructed by Mr. Mitchell, of the firm of Mitchell & Bucknall, millers of Willwood. Mr. Webster, of the mill, is the engineer under whose direction the dam was conceived and erected. The turbine wheel is 100 horse power, and in the course of a month will be in its place, when the sotplogs will be inserted and the water raised. The cost of the dam is about $3,000, and if it should prove a success, it will be the pioneer of similar structures which will furnish power for the population along the whole course of the Assiniboine river and one more link in the chain of development that is fast awakening the silent prairies from their sleep of idleness.—Russell, Man., Chronicle.

The Consolidated Electric Company of St. Johns, N.B., is adding considerable new machinery to its plant. This machinery was put in by the Northey Manufacturing Company, of Toronto, and is in many respects different from any other in the Dominion, or perhaps in America. The water is taken from the harbor, where the great rise and fall of the tide makes this a somewhat difficult matter. A pumping station was built on the end of the wharf. In this a geared duplex power pump of the Northey Manufacturing Company's most approved design was placed, weighing about six tons and with a capacity of 1,500 gallons a minute. The large pump has to raise the water by suction and then force it to the station fully 500 feet away. The lift at low water is a very great one, while at high tide it is not very far. The pump is operated by a 30 h. p. dynamo stationed with the power station machinery. The condenser is what is known as a surface condenser, and is similar in design to those used on ocean steamers, but much larger.

The Mission City, B.C., Board of Trade, are negotiating for the erection of a woolen mill at that place.

The Farmers' Joint Stock Grist Mill Company, of Alameda, Assa., has been incorporated.

The General Electric Company of New York, is working two Canadian mica mines, one at Sydenham, near Kingston, and the other at Cantly, Que.

The Town Council of Annapolis, N.S., will purchase the electric light plant which has been furnishing the streets lights.

Work has been commenced on the construction of the electric street railway at Kingston, Ont.

South Edmonton, N.W.T., is contemplating the construction of an electric railway, at a cost of $100,000.

The Safety Bay Lumber Company's planing mill at Norman, Ont., was destroyed by fire a few days ago, loss about $7,000.

An electric street railway will be built in Cote St. Louis to connect with the Montreal Street Railway. The municipality have granted a thirty years' franchise. Work will be commenced at an early date.

At the annual meeting of the American Boiler Manufacturers' Association of the United States and Canada, recently held at Chicago, Mr. F. E. Leonard, of London, Ont., was elected third vice-president.

Mr. E. W. B. Snyder, St. Jacobs, Ont., is making alterations and improvements in his roller flour mill, including a new Armington & Sims engine, built for him by Messrs. Nie & Lynch, of Hamilton, Ont.

The Department of Railways and Canals have awarded a contract to the Central Bridge Works, Peterboro', Ont., for about $50,000 for the construction of 1,200 lineal feet of steel pipe, with angle plates and flanges, to be used in the new Sault Ste Marie Canal.

The E. B. Eddy Company is preparing to erect another paper mill at Hull, Que., this being the third in two years. The previous mills and plant cost $400,000. The match factory has closed down for the summer, and may possibly be transformed into a paper mill also.

The Toronto Street Railway Company will extend their Mimico road another two miles, this will take it to the west side of New Toronto. Mr. John Galt, C.E., is employed by the company to make the surveys, design the bridges, and to attend to all the engineering work in connection therewith.

President J. W. McRae, of the Ottawa Electric Street Railway Company, says that the gross receipts for the company's financial year were $109,000, of which $10,000 was carried to the reserve fund, after a dividend of 8 per cent. had been paid. The number of fares collected was 2,284,000.

Messrs. Petter & Co., Guelph, Ont., not having been able this year to keep up with the demand for their axles, an addition to the works, 120 x 30, has been constructed, a new trip hammer and several lathes are being put in, and in other ways the capacity of the works increased. From one Brantford firm alone an order for 4,000 sets has been received. At present there are twenty-eight men employed at the works.

THERE are within the Province of British Columbia 53 saw mills, with an aggregate capacity for cutting 1,850,000 feet of lumber per day; 40,678,256 feet, valued at $410,951, being exported seaward during 1892; 386,122 acres of timber lands are leased by the mills. An average of 20,000 feet per acre is considered a very low estimate of the timber contained in these limits.

THE Eureka Woolen Mills Company, Eureka, N.S., have placed a new 36 h. p. engine in their factory. It was built by the Pictou Iron Foundry & Mufg Co., Pictou, N.S.

THE municipality of Puerto Principe, Cuba, have put in an electric light plant. The whole plant, which consists of two 750 light alternating dynamos with lamps, sockets, transformers and everything necessary for a complete electric light plant, were purchased from the Royal Electric Company of Montreal. This we believe is the first shipment of Canadian-made electrical machinery to foreign ports. A private company in Port au Spain, Isle of Trinidad, are also negotiating with the Royal Electric Company for an electric plant similar to this.

THE HOLYOKE OF CANADA.

A PAPER-MAKING machine valued at $25,000, will arrive in Hull in a few days, says the Ottawa Journal. It will be placed in the E. B. Eddy Company's new mill, on which a large gang of men are now putting the finishing touches.

The new mill, which is the third the company has started since it began operations about a year and a half ago, is the old sash and door factory altered to suit paper-making. The alterations have been very extensive, amounting practically to an entire gutting of the building. So extensive are the changes, that a big force of men have been working since May. When ready for operations, the new mill, with the machinery, will cost between $60,000 and $70,000. The building is two storeys stone, and in size is 180 feet long by 60 wide.

The new mill will be used principally for making book and writing paper, and the machine will be one of the finest anywhere in America. In this building there will be four water filters, which will filter 1,000,000 gallons of water daily. Several additional water wheels will also be put in.

It is also likely that before long, to meet the growing demands of the company's business, the big three-storey stone storehouse, 220 feet long and 80 feet wide, will be turned into a paper mill.

"Look here," Mr. Eddy said, "let me tell you something. This place is going to be the Holyoke of Canada. And don't you forget it.

"Why, ever since we started, a year and a half ago, the only time these machines have rested was on Sunday. Day and night they have gone, and, even so, we have been unable to fill the orders.

"Every 24 hours we turn out fifteen tons of paper for the newspapers. Nearly every paper of any account in Canada is on our order book."

The various buildings and machinery used by the company have involved an expenditure of between $450,000 and $500,000. The labor employed is principally skilled, and high priced. Several of the men have been brought out from England.

THE Paris Tool Manufacturing Co., Paris, Ont., have been incorporated with a capital stock of $20,000 to manufacture the Houghton patent wrench.

THE Toronto Glass Company are applying for incorporation with a capital stock of $50,000. Some of the parties interested are John C. Malcolmson, Wm. B. Griner and George Morris, all of Hamilton.

THE Brown Mnfg Co., of Belleville, Ont., have completed the iron work for the cattle market bridge at Toronto. All the material was shipped last week.

MESSRS. SMITH & RICE are about to build a machine shop and foundry at Stanstead Junction, Que.

A SPECIAL train of 16 cars was loaded with binders at the Massey-Harris Works, Brantford, Ont., last week. There were 200 of the machines, and they formed part of an order for 400 recently received from Buenos Ayres, South America.

THE Pembroke Lumber Company have decided to keep one saw in their big mill running throughout next winter. To do this they intend piling about thirty thousand saw logs in their yard. They will also erect a large lumber drying kiln.

FIRE in the boiler room of Messrs. Shirley & Dietrich's saw factory, Galt, Ont., a few days ago, did about $400 damage.

MESSRS. McRAE & Co., Ottawa, Ont., are now operating the Allan & Fleming mica mines at Wakefield.

AN electric light plant will be established at Tilbury, Ont., by the Reliance Electric Manufacturing Co., of Waterford, Ont.

MESSRS. D. J. AYER & COMPANY, glove manufacturers, Moe's River, Que., are adding more machinery to their plant.

THE Ogilvie Milling Co. have recently expended $80,000 in refitting their mill at Winnipeg, Man., with the latest improved machinery, and are now producing a high grade of Hungarian flour.

MESSRS. GARSON, PURSER & COMPANY, of St. Catherines, Ont., have been awarded the contract for building the Boston and Nova Scotia Coal Company's railway in Cape Breton, N.S., 18 miles in length.

THE Victoria Brewing & Ice Co., and the Phœnix Brewing Co., Victoria, B. C., have concluded their consolidation as the Victoria-Phœnix Brewing Co., limited.

THE match factory in New Westminster, B.C., is now in full operations, and is turning out an excellent article.

THE Oxford Foundry Company, Oxford, N.S., have put in a new 20 h. p. boiler.

MESSRS. A. McPHERSON & COMPANY, Oxford, N.S., have placed a new 40 h. p. engine in their works.

THE Acadian Coal Co., Stellarton, N.S., have added another hoisting engine to their plant.

THE IRON WORKS AT FERRONA, N. S.

THE development of the iron business in Pictou county should prove an incentive to those interested in iron in Cape Breton. Only a year ago the extensive iron works at Ferrona, Pictou county, were established, and to-day there is one of the finest enterprises in Canada located at this place. Ferrona is reached by the I. C. R., and is some five or six miles from New Glasgow. After leaving the I. C. R., the railway of the New Glasgow Iron, Coal & Railway Company, the company owning and operating the industry, is taken up to the iron works. The railway of this company is fifteen miles in length, and taps the valley of the East River, one of the finest farming localities in the Maritime Provinces. The New Glasgow Iron, Coal & Railway Company gives employment to some 500 men in connection with their magnificent plant at Ferrona. This company uses 300 tons of coal each day for coking purposes, 200 tons of ore and 100 tons of limestone, coming from the deposits which this railway taps further up the East River. Passenger trains run over the line, which has half a dozen different stations on the road, and is of incalculable benefit to the farmer, in affording means of access to a lucrative market. The splendid plant at Ferrona strikes the observer as almost occupying the position of a town itself. The furnaces, the stock-house, the coke ovens, the engine house and the offices of the company cover indeed quite an acreage. The furnace turns out about ninety tons of pig iron each day. There are four casts in the twenty-four hours. When the cast is running out the molten matter finds its way into the pigs all ready for its reception, and, when cooled and culled, adds one more tier to the pig iron ready for transportation and manufacture into steel. The moving mass of fire as it seeks its prepared abiding place is one of the most attractive features of the whole work, because, for one thing, it is the climax—the practical outcome of all the previous material and labor—the production of man's art and thought as it comes in touch with the arranged elements of nature. The furnace is charged with the regulation quanties of ore, limestone and coke. There is a coal-washing plant where all the coal is purified before coked, being thus eliminated of sulphates, phosphates, etc. There are fifty coke ovens at Ferrona, into which the coal thus purified is dumped and made. This coke plant is one of the finest in America. It is of German design and is managed by Mr. Zirker, who formerly held a responsible position in the famous Krupp gun works in Germany. There are all the modern improvements of utilizing the waste gases from the blast furnace, and coke ovens for generating steam and heating the hot blast stoves. At one time this hot gas was belched out and lost, but it is now utilized, no coal now being used for generating steam. There is a laboratory on the grounds, in which Mr. J. D. Fraser, son of Manager Graham Fraser, is the chemist, and who analyses the iron ores, limestone, coal, coke, pig iron and slag for the furnace. All these things are necessary so as to know what is being done. Everything to-day in this business is told by analysis, not by rule of thumb. The New Glasgow Steel Works obtain their pig iron for manufacturing into steel from Ferrona. This home supply of pig iron is something never before accomplished in Canada. Heretofore all pig iron was imported from Scotland, Norway, Sweden and Spain. As a result of the supply from Ferrona, the steel works at New Glasgow is certain to more than double its present capacity in the course of a year or so, being no longer obliged to depend upon the importation of pig iron. Instead of one blast at Ferrona, there will soon be three or four. The steel works at New Glasgow employ about 500 men, and thus the iron and steel works combined give labor to more than 1,000 men. These two immense enterprises are under the same vigorous manager, Mr. Graham Fraser, to whose energy, courage and foresight is due the great iron development of Pictou county. Mr. Harvey Graham is the energetic secretary of the Ferrona Iron Works, whose place during part of this season, during the former's absence in Upper Canada on business connected with the works, has been efficiently filled by Mr. Frank Rice, a Cape Breton boy, The accountant at Ferrona is Mr. F. M. Pauley, who will be remembered by a number of old-time friends in North Sidney. The splendid condition of the iron industry in Pictou has many lessons for the people of Cape Breton. There is every evidence of there being iron in large workable quantities in this county. It now remains for our friends here to seek for means for developing these rich resources of ours, and by every possible manifestation of push and courage on our own part be enabled to invite push, courage and capital from abroad.—North Sydney, N.S., Herald.

MESSRS. MARTIN & GOUETTE'S planing mill and sash and door factory, Montreal, was destroyed by fire last week.

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 Woolen Manufacturers. **Dyed Samples** furnished on application. Address all correspondence to Head Office, Detroit, Mich.

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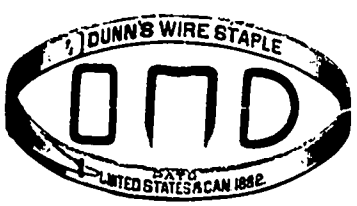

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McARTHUR, CORNEILLE & CO., Montreal.—Supply of best quality at closest prices, every description of coloring materials required by manufacturers of woolens, cottons, silks, paper, Leather, etc. Are sole agents in Canada for the celebrated aniline dyes of A. Poirier, Paris.

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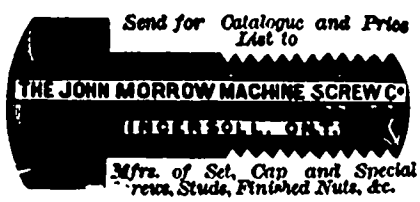

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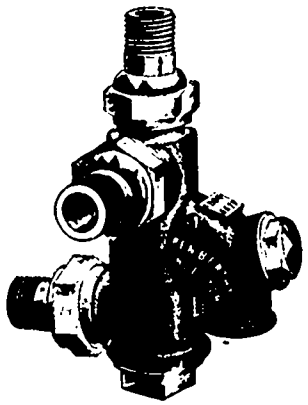
WELLAND VALE MANUFACTURING CO. Lock No. 2, St. Catharines, Ont., Canada. Manufacturers of axes, scythes, forks, hoes, rakes and edge tools.



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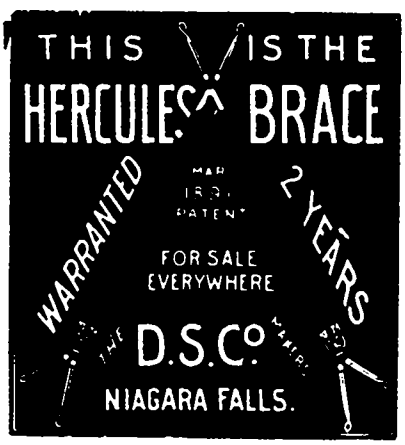

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Industrial and Trade Directory.

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C. G. ELRICK & CO., Sheppard St., Toronto, and 61 St. Francois Xavier St., Montreal.—Manufacturers of Horn and Rubber Combs, etc.

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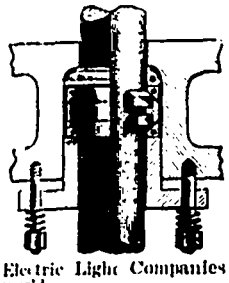

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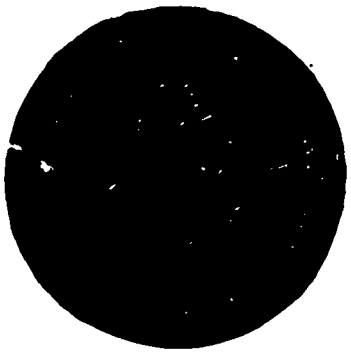

W. K. McNAUGHT, President. J. J. CASSIDEY, Secretary
GEORGE BOOTH, Treasurer.

Office, Room 66 Canada Life Building

KING STREET WEST, TORONTO. TELEPHONE 1274

THE OBJECTS OF THIS ASSOCIATION ARE:

To secure by all legitimate means the aid of both Public Opinion and Governmental Policy in favor of the development of home industry and the promotion of Canadian manufacturing enterprises.

To enable those in all branches of manufacturing enterprises to act in concert as a united body whenever action in behalf of any particular industry, or of the whole body, is necessary.

To maintain Canada for Canadians.

Any person directly interested in any Canadian manufacturing industry is eligible for membership.

Manufacturers desiring to hold meetings for the promotion of their business are invited to avail themselves of the Board Room of the Association for the purpose, which is offered to them free of charge.

J. J. CASSIDEY, Secretary.

Millers' and Manufacturers' Insurance Co'y

STOCK AND MUTUAL

ESTABLISHED 1885

The President, James Goldie, Esq., in moving the adoption of the report on the business of 1892, said: I have much pleasure in drawing your attention to the fact that this Company has verified, in a marked degree, every expectation set forth in the original prospectus when organized in 1885.

Up to the present time the insurers with this Company have made a saving, when compared with the current exacted rates, of $91,001.20 And in addition thereto bonus dividends have been declared to continuing members amounting to $21,522.72.

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Such results emphasize more strongly than any words I could add the very gratifying position this Company has attained. I, therefore, with this concise statement of facts, have much pleasure in moving the adoption of the report.

The report was adopted and the retiring Directors unanimously re-elected. The Board of Directors are now constituted as follows: James Goldie, Guelph, pres.; W. H. Howland, Toronto, vice. pres., H. N. Baird, Toronto; Wm. Bell, Guelph; Hugh McCulloch, Galt; S. Neelon, St. Catharines; George Pattinson, Preston; W. H. Story, Acton; J. L. Spink, Toronto; A. Watts, Brantford; W. Wilson, Toronto.

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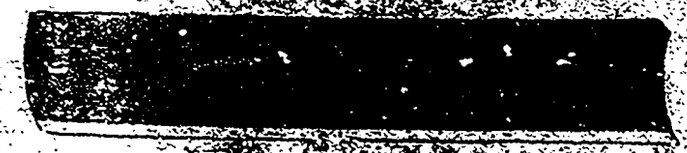

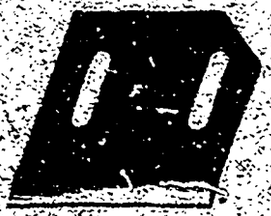

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