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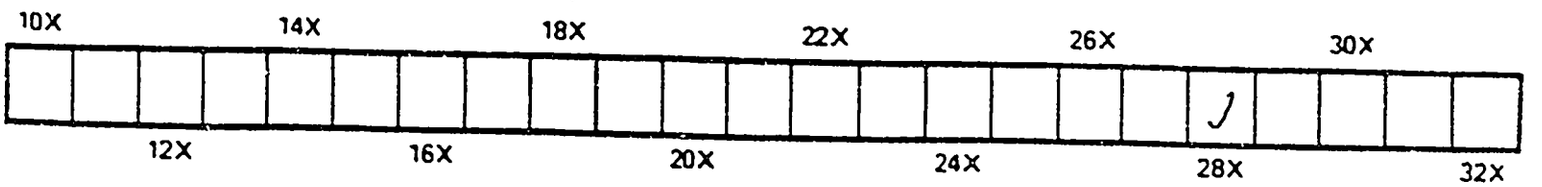

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DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

VOL. 24. TORONTO, JUNE 16 1899. No. 12

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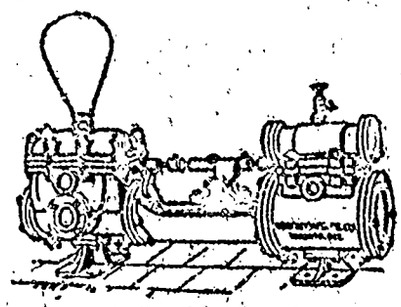

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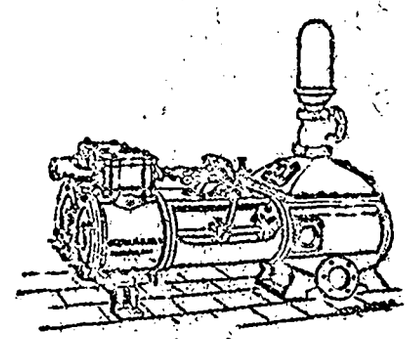

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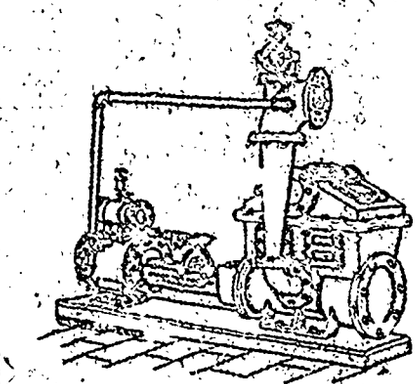

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CUSTOMS RULINGS.

THE Customs Department have issued a ruling to the effect that in view of want of uniformity at customs ports in collecting duty upon measuring tapes, in future such articles, whether in cases or otherwise, are properly dutiable at the rate of 25 per cent. ad valorem under item 296 of the tariff.

On May 19 an order in council was passed changing the name of the port of entry known as Clifton to that of Niagara Falls, the latter being the name of the post office and railway station at that place, the change to take effect July 1, 1893.

On the same date an order in council was passed ordering that Nelson, in the Yale-Kootenay district in British Columbia be made an outport of customs and a warehousing port, under the survey of the Collector of Customs at New Westminster, B.C, to take effect on July 1, 1893.

MUGWUMPERY.

OUR esteemed contemporary, the Montreal Star, which is a most decided mugwump as far as tariff reduction goes, comes to the defence of Mr. McCarthy and Mr. Cockburn, and upholds them in their declarations that certain Canadian manufacturing industries should be allowed to die out by withdrawing from them the 'tariff protection they enjoy, because 'the course of trade and manufacture has altered greatly since the National Policy was adopted." It declares that Mr. Cockburn, *at least, is a National Policy man and a protectionist,* but that he believes that changing conditions have made corresponding changes necessary in the tariff. It also presumes that this journal is anxious that the protective system shall survive the next elections, and if this be our wish we could not mislead the Government with worse advice than by counselling it to claim for the existing tariff the authority of plenary inspiration that it is the supremest folly to refuse to read the signs of the times.

We are not "firing on friends," as the Star supposes in what we have said regarding the mugwumpery inclinations of any of our distinguished statesmen. Of late it has become a popular fad among one time supporters of the National Policy to assume a loftiness in their political views which is far above the ordinary comprehensions of every day life, and which places them, in their opinion, high up and in the possession of effulgent glory among heavenly bodies. They do not condescend to tell what they mean, nor to what they allude when criticizing the tariff, but deal in glittering generalities which sound like the murmur of rippling rivulets adown steep mountain declivities, or glisten and sparkle and scintilate like the morning dew in the bright glad sunshine, or like the phosphorescent light of a defunct codfish. They tell us with majestic gesticulation that some of our manufacturing industries have disappointed their expectation: that they have not proven themselves to be the unbounded blessings that was *hoped or promised for them, and that therefore* they should be immediately squelched and extinguished, so that even the remembrance of them should be no more known among men. That is just about what Mr. Cockburn and Mr. McCarthy and the Star and other mugwump lights tell us; and when we most respectfully ask that we be enlightened as to what they really mean; when we ask for a bill of particulars; when we desire to know the character of some of these derelict and offending industries, we are told that we are firing upon friends. This is the culmination of nonsense.

This journal has never claimed that the tariff is perfect. On the contrary we have always recognized the fact that the tariff, being the work of human hands, could not possibly embody perfection, and that it was the duty of the Government to correct such imperfections and incongruities as might be pointed out as existing in it. As between the two widely differing theories of protection and free trade, we believe that the policy which the Government have adopted, and which the people have time and again sustained, is the better one for Canada. We do not consider that protection contains any remarkable element of divinity, neither do we believe that free trade embodies any special law of God intended to influence the legislation which should govern any of His people. They are both of human origin and, as such, liable to change as well as to error. With this fact before us we have frequently observed that some of the provisions of the tariff *have not given the satisfaction that had been hoped for,* and that in some instances they were doing more harm than good. We know that protection has many enemies who are always seeking the opportunity to destroy it, as well as many friends who desire to perpetuate it. And we also know that because of its imperfections it needs amendments. But when we are ill we do not send for a physician in whom we have no confi-

dence, and who we know is not our friend, to minister unto us. We call in one whom we can trust, and in whom we believe. Unlike Mr. Cockburn and Mr. McCarthy and the Star, in calling in a physician—in endeavouring to have the incongruities of the tariff corrected—we speak in an intelligent voice, and are able to indicate where the trouble lies. We do not chatter about mouldering branches and spoon-fed excrescencies. To do so would be like the sounding brass or the tinkling cymbal; and quite unintelligible, meaning absolutely nothing; but we know just where the trouble is and say so. There is no refusal to read the signs of the times. We do not shut our eyes to obvious facts. We recognize the existence of tariff incongruities, know what they are, see wherein they work harm in the community, and ask for a correction of them. We do not ask that the barn be burned for the sake of destroying any rats that may infest it. We do not ask that the National Policy be destroyed because there are some incongruities of the tariff. We do not hesitate to point to them and ask that they be corrected.

The Star endeavors to discredit our National Policy by comparing it with the McKinley tariff. It speaks of the bitter cry heard in the western states because of the burden of mortgages that bear them down, and of complaints of the mechanics of the east because of over taxation; and it tells us that these are the result of the love of the manufacturing states for protection, and of the fealty of protectionists to their party banner. Of course this is a very unfair argument not mitigated by the assurance that in Canada the guardians of protection have not been guilty of the primal blunder of proposing to increase the tariff in a time of general distress. No doubt the Republican Party did an unwise thing in attempting to injure Canada; and while such mistakes may very correctly be considered as crimes, it must be remembered that the American people were instigated to the commission of them by those who call themselves Canadians, and who preach that this country cannot but be both helpless and hopeless while dissociated, politically, from the United States. But that feature of the McKinley tariff is not in accord with the ethics of protection, and was created in the hope that it would force Canada into the American Union. In fact this whole outcry against the McKinley tariff is a cry raised by the enemies of protection to defeat the very policy that has done more than anything else to advance the United States to the high position it now occupies before the world; and the challenge to show wherein that country has materially suffered from McKinleyism, so called, will go unaccepted and unanswered.

But with that question we are not now dealing, but we are endeavoring to show that the outcry against our National Policy, as now going up from the throats of our mugwump friends, is senseless in the extreme. Tariff revision does not mean tariff destruction, and it may mean the raising of duties in some directions as well as the lowering of them in other directions. Thus, while it would be well, and in the interest of the whole country, to raise the duty on scrap iron, it would also be well to lower the duty on sugar; and while it would be well to put some now dutiable articles on the free list, it would also be well to take steel rails from that list and impose a duty upon them. These illustrations are of incongruities which ought to be corrected. If Mr. Cockburn desires to strengthen the hands of the ministers, and to demonstrate that he is a friend of the National Policy, let him fight on this line.

A CRY FOR TARIFF REFORM.

It excites some languid interest to observe how some trade journals spread themselves in discussing the tariff. Thus our newly-fledged contemporary, the Canadian Engineer, on the first page of its initial number tells us that, while its mission is not political, yet "if it touches on the political aspect of industrial questions it will only be for the purpose of casting back upon the tide of fair competition those industries which have become inflated by extravagant duties into mere monopolistic schemes," whatever that may mean. It also undertakes the defense and support of those manufacturers who, "because they command no votes or have no 'pull,' with the Government, are left with but a nominal protection, or else actually handicapped in their relation to the hand-fed industries that have the pull," whatever that may mean. It also points out that "as the day of wooden ship building is closing, and that of iron ship building opening, no industry stands in more need of reasonable encouragement;" that as "Canada led the world in wooden ship building in years past, there is no reason why, with our splendid maritime position, and the abundance of coal and iron in our sea-coast provinces, we should not gain equal fame in iron ship building in future years."

No doubt our contemporary means well, but overlooking its involvement of phrases, considering that it has undertaken to fill a long-felt want in Canadian journalism, we would esteem it a favor if it would suggest what industries have become inflated by extravagant duties into monopolistic schemes. Please tell us upon what particular articles of foreign production extravagant tariff duties are laid. We would be pleased to be informed what industries there are that have such a pull with the Government as to enjoy any undue advantages as regards the tariff; and also what industries are deficient in tariff protection, and have failed to obtain it because they command no votes. We would also be pleased to learn the definition of "hand-fed industries."

We fail to see the manner in which the close of wooden ship building and the opening of iron ship building, either in Canada or elsewhere, is connected with the tariff. If iron ship building stands in need of reasonable encouragement, in what would consist that encouragement, and how would it be applied? The [illegible] of wooden ships virtually passed away thirty years ago, giving way to iron vessels, and the Canadian tariff had no more to do with the event than it has upon the laws of gravitation. It might be interesting to our contemporary to learn that the power does not reside in the Canadian Government to make any laws by which Canadian vessels of any description can possibly have any exclusive privileges over any other vessels that fly the British flag in Canadian waters. There are many ships now employed in our local traffic, some of them built in Great Britain, many of them in the United States, upon which not one dollar of duty was ever paid, and never will be. Canada is perfectly helpless in this matter.

NO DEMAND FOR MILL IRON.

THE Toronto Mail, speaking a few days ago of the vote then about being taken in Hamilton to endow smelting works there, said:

If this carries it will be the signal for an outbreak of municipal liberality to private corporations all over the province. If one city speculates with its money others will feel in duty bound to do the same. Besides Toronto and Kingston, the town of Belleville now aspires to be the centre of the iron industry. Some years ago Belleville voted a bonus for the establishment of smelting works, but it was never claimed. It is now proposed to make another effort to capture the industry. If all these places embark in the business, what will be done with the products after the municipal and federal bonuses are drawn?

Of course the Spectator had something to say to this, and this is what it said:

If the Hamilton smelting works bonus by-law is endorsed by the people—and it is certain to be—there won't be any outbreak of the smelting works disease all over the province. The Hamilton works will supply iron enough for the province and more too. And Hamilton has certain special advantages for smelting works that no other Canadian city has, and which will put all others out of the race. There is no danger whatever of smelting works springing up all over the province.

We hope that Hamilton may have the blast furnace it so much desires, and that it may be operated to good advantage, producing two or three hundred thousand tons of pig iron per year. But whether all this output could be consumed in Ontario, or even in all Canada, depends. It would depend upon the quality of iron it would produce. If it produced a uniformly good quality of foundry iron no doubt every ton would find a purchaser. If it produced any considerable quantity, then, unless a demand other than any that now exists should spring up, the mill iron would remain piled in the yards of the furnace company at Hamilton, and the furnace would not prove a profitable investment. No blast furnace practise has ever yet succeeded in obtaining all foundry iron. There is always a variety of iron produced, and there is always a large proportion of mill iron which is not desirable for foundry use. The only uses to which mill iron can be put is to manufacture it into puddled iron, or to convert it into steel. There is no steel plant in Hamilton or elsewhere in Ontario, so that any mill iron that the proposed furnace might produce would not be required in that direction; but there is a plant in Hamilton, where there are puddling furnaces, and the iron could be there manufactured into first-class refined bar iron. But unless the tariff should be somewhat changed, although Hamilton pig iron might be made within a stone's throw of the Hamilton puddling furnaces, never a ton of it would be thus consumed. And so Hamilton and the Spectator and the blast furnace people would face a painful disappointment. It costs several dollars per ton to manufacture puddled blooms of pig iron, and there would be a yet further expense in manufacturing the blooms into finished refined iron; but the Hamilton puddling furnaces will never be used for such purpose as long as wrought scrap iron is charged with a duty of only two dollars per ton and the world's supply of scrap is not exhausted.

It was only a few weeks ago that the feelings of the Spectator were considerable affected at what we had said in this matter, very foolishly suggesting that our discussion of the question grew out of unkind feeling for Hamilton. Because there are rolling mills in that city it did not wish any change to be made in the tariff that would unfavorably affect that industry. But now it looks hopefully to the time, which we sincerely wish may be in the near future, when it will have a blast furnace in operation; yet it seems never to have occurred to it that blast furnaces are not operated for amusement, and that for them to be financially successful there must be a demand for all the iron, of whatever character that may be produced. But this demand will never exist until proper changes in the tariff are made. If the changes are not made the Hamilton blast furnace cannot prove a profitable investment. If the changes are made the Hamilton rolling mills people will have to put their puddling furnaces in operation, thus creating a demand for Hamilton mill iron. The Spectator seems to be between two fires.

PROFESSOR SAUNDERS' REPORT ON BEET SUGAR.

WHILE it must be admitted that the beet-sugar industry in Europe could not have been established or prosecuted with any prospects of success except under the system of very liberal bounties on exports, together with heavy import duties on foreign sugars, this does not warrant the conclusion arrived at by Professor Saunders, who says in his report, see page 36:

"It is not yet practical to make beet sugar at such a price as will enable the operator without a bounty to compete with cane sugar, and in view of the improvement taking place in the quality of the cane and in the process of manufacturing of cane sugar, there seems to be no prospect of the beet sugar industry ever becoming self-sustaining."

On same page he says: "In the older European countries, where labor is abundant and cheap, farmers cannot be induced to grow the quantities which the factories require at the prices they are willing to give; hence more than half of the beets used in Germany, and a large proportion of those consumed in France and other European countries, are grown by the companies who own and work the factories."

On page 37 he says: "The forty large factories which would be needed to produce the sugar required for home consumption would each employ from 200 to 220 hands, or 8,000 to 8,800 in all." And again: "It is probable that the strongest objection to the encouragement of this industry, on the only basis on which it is claimed it could be established, will be found in the fact that it would require, when fully developed, an annual subsidy of about $4,000,000, for the raising of which, as long as we have free sugar, other industries must be taxed, This subsidy might in the course of time be lessened, but in view of all the facts presented, of the great richness of the sugar cane when grown in the tropics, and the probabilities of further improvements in the quality of the cane and in the process of manufacture, it is not likely that the bounty could ever be much reduced, without crippling the industry."

It is impossible to read Prof. Saunders' report carefully without coming to the conclusion that he entered upon it with a predetermination to report unfavorably, whether under the influence of his own judgment or otherwise. His lamentable failure in the selection of the proper variety of two-rowed

barley for seed, and the frightfully exorbitant price which he paid for the inferior barley which he purchased, might have warned Government as to the impropriety of relying upon his judgment in this important beet sugar business.

With respect of the alleged experience in Europe of the difficulty of inducing farmers to raise sufficient beets for the factories at moderate prices, and the consequent necessity imposed upon the companies for raising their own beets, this opinion of Mr. Saunders' is in direct conflict with the reports of United States Consuls, who advise their Government that the growing of beets is so profitable that, rather than accept the prices paid at the factories, in many places, beet-growing farmers formed themselves into co-operative companies for manufacturing sugar, and in this way realized for themselves the profits which would otherwise have gone to the manufacturers. The consuls say that this is the reason why so many factories raise their own beets. Apart, however, from this fact, the consideration of the constantly increasing production of beets and outturn of sugar is incontrovertible evidence that beet cultivation does pay. If the manufacturers can afford to raise beets for their factories, it must surely pay farmers to raise them at the price which it costs the manufacturers to do so.

Prof. Saunders says that owing to the "probabilities of further improvements in the quality of the cane and in the process of manufacture, it is not likely that the bounty could ever be reduced without crippling the industry." Anyone who could employ such an argument must have studied the relative improvements in cane and beet cultivation, and in the scientific extraction and manufacture of both kinds of sugar to very little purpose, if he has not discovered that the improvements in beet sugar production have largely excelled the improvements in cane, and that the improvements are being more and more perfected every year.

Prof. Saunders, in treating of the bounties on beet sugar, says: "It is not yet practicable to make beet sugar at such a price as will enable the operator, without a bounty, to compete with cane sugar;" and again: "There seems to be no prospect of the beet sugar industry ever becoming self-sustaining;" and finally he says, in speaking of the prospects for Canada: "It would require, when fully developed, an annual subsidy of $4,000,000."

It would be difficult to combine a greater mass of misrepresentation and absurdity than is contained in these extracts. By referring to the annual report of the Secretary of Agriculture of the United States for 1891, pages 156 and 157, a clear and full report of the law in Germany as to sugar bounties or rebates is found. It shows that on August 1, 1888, the present law came into force with certain rebates, to continue in operation until August 1, 1892. The amount of the bounty varies somewhat, according to the quality of the beets worked and the percentage of sugar obtained: a tax being imposed on every 100 kilos of beet roots worked, and a rebate granted on every 100 kilos of sugar exported, the difference between these two forming the bounty. The report says: "It is thought that the present bounty or profit accruing to the manufacturers amounts to 2.12 marks per 100 kilograms." This is the equivalent of 23 cents per 100 lbs on all sugar polarizing at least 90 per cent.

After August 1, 1892, the amount of drawback to be allowed up to July 31, 1895, was fixed as follows: On raw sugar, not under 90 per cent. equal to 13½ cents per 100 lbs; on sugar polarizing at least 99.5 per cent., 21½ cents; 98 per cent., 18 cents per 100 lbs. From August 1, 1895, to July 31, 1899, another reduction takes place, the drawbacks being lowered to 11.19 and 15 cents respectively. After 1897 it is supposed that no rebate in the form of a premium will be paid.

In the face of these facts, Prof. Saunders, whether in ignorance of the position or ignoring it, sees no prospect of a less subsidy than $4,000,000 per annum being sufficient to sustain the beet sugar industry in Canada.

The history of the beet sugar industry in Germany affords conclusive evidence of the very great difficulties which its promoters had to encounter during the early years of its operation, and of the failure which must have resulted but for the very liberal manner in which it was aided by Government bonus, and the heavy duties imposed upon foreign sugars. Every decade showed a marked improvement in the quality of the beets grown and in the scientific process of their manufacture into sugar. From time to time the amount of bonus was reduced, but these reductions stimulated the manufacturers into improved methods, so that production has kept on increasing with marvellous rapidity, and the sugar industry of that country is not only one of its most extensive manufacturing industries, but it is now, as has been shown, practically self-sustaining. The Sugar Beet, of March, 1893, published in Philadelphia, reports the quantity of raw sugar produced in Germany during the season 1891-92, at 1,144,750 tons, being an increase of 200,000 tons over the production of five years previously, and this notwithstanding the great reduction in bounty which commenced in 1888.

The attitude of what may be called the free trade Government of Ontario towards this industry has been in marked contrast with that of the National Policy Government of the Dominion. For two or three years the promoters of this new undertaking applied to Hon. Mr. Drury and Hon. Mr. Dryden, then and present Ministers of Agriculture for this Province, for grants of moderate sums of money to assist in distributing seed and collecting the roots and in procuring information. Every application was generously and cheerfully acceded to, and the results of the small expenditure of time and money were so favorable that, but for the change in the sugar policy of the Dominion, there was a good prospect of forming a strong company for the purpose of erecting a large beet sugar factory. The promoters had an interview with some members of the Ontario Government, at which their reception was everything that could be hoped for, and they were led to anticipate future assistance on certain conditions which were fair and reasonable. On the other hand the attitude of the Dominion Government has been one of cold indifference, if not of actual hostility. In 1891 over 400 experiments were made on a larger scale than formerly, in the cultivation of sugar beets in all parts of this Province. The Ontario Government had paid for the seeds and the expenses incurred in their distribution. In the fall of that year application was made to the Agricultural Department at Ottawa to send some of their staff to collect the roots for analysis. The application was refused; "no funds" at their disposal for such a purpose being the excuse. Correspondence was opened with Ministers at Ottawa asking for the admission free of duty of the machinery required for the proposed factory, for

such parts as could not be economically manufactured or not at all manufactured in Canada To this application, also, the answer was unfavorable They were asked whether, in view of the abolition of the duty on sugar, they could assist the proposed undertaking by bonus or otherwise. The answer was that the subject would be referred to a commissioner for report. The commissioner did report, and almost every page of Prof. Saunders' report bears evidence that it was written in the interest of the refined sugar combine, who, by the peculiar arrangement of the tariff, have been able to realize millions of unearned money from the people of Canada.

In establishing a sugar beet industry in Canada its promoters would not have anything like the initial difficulties to contend with that were experienced in Europe. They have the benefit of all the improvements in seed, cultivation of crop and manufacturing processes, which nearly half a century of experience has accomplished. A moderate bonus secured for a few years should enable the industry to be self-sustaining. The machinery required is very complicated and expensive: a large annual expenditure is necessary for skilful management All experience goes to show that large capital and large works are essential to economical construction and operation. The assurance of Government assistance for a few years is necessary to induce the investment of capital. A small excise duty on the highly protected refined sugar would lessen the profits of the monopolists without increasing the price to consumers. This duty, say 30 cents per 100 lbs. on refined sugar, would produce in one year more than enough to secure the establishment and operation of several beet sugar factories.

CANADIAN SEAMEN IN AMERICAN VESSELS.

Immigrant inspector De Barry, of Buffalo, is a very good law unto himself until he is set down upon by some of those whom he would oppress by his cruel and senseless actions. He has lots of fun deporting Canadians who may venture across the line and seek any sort of manual labor within his bailiwick. There is a similar immigrant inspector at Chicago named Stitch; and it seems that he does not attempt to prevent Canadian seamen accepting employment on American vessels at that place. There is a seamen's union at Chicago that attempts to regulate the wages of seamen, and also to prevent Canadian seamen from obtaining employment there. Inspector Stitch has declined to interfere in the matter, holding that there existed no law which forbids Canadian seamen serving on American vessels. The Chicago Seamen's Union consulted with Inspector De Barry at Buffalo, asking his view of the matter; and he has written a letter to the Union in which he says: "We are driving the Canadians out of this port. I have informed the captains here that only the seamen who lived in the United States all winter can work here, except, of course, those young men who now come for the first time;" and he expressed the opinion that if Inspector Stitch of Chicago performed his duty no Canadian seamen would be allowed in that port.

It is a fact that Inspector De Barry has prevented Canadian seamen from obtaining employment on American vessels at Buffalo; and because Inspector Stitch does not do the same thing he has incurred the enmity of both the Seamen's Union and the Federation of Labor. In Mr. De Barry's effort to run Chicago as well as Buffalo, he wrote to Superintendent Stump, of the Immigration Bureau at Washington, asking for a ruling in the question. The matter was referred to Solicitor Reeves, of the Treasury Department, and in his reply he states as follows:

Section 4,131, R.S., prescribes that "officers of vessels of the United States shall in all cases be citizens of the United States." If Congress has the power, as unquestionably it has, to require that the officers of vessels of the United States shall be citizens of this country, it also has the power to prescribe that only citizens of the United States shall be employed on American vessels as seamen; or that it shall be unlawful to enter into contracts with aliens to perform service as seamen on board American vessels. Now, while Congress has not seen fit to prohibit the employment of aliens on American vessels in express terms, yet I am of the opinion that bringing aliens or foreigners to this country under contract to perform labor as seamen, etc., on American vessels running between the United States and Canada is in violation of the Act of February 26, 1885, and the Act of March 3, 1891. In this opinion I have the concurrence of Elihu Colman, United States Attorney for the Eastern District of Wisconsin.

Supt. Stump of the Immigration Bureau transmitted this opinion to Inspector Stitch of Chicago with the following comments:

Several bills have been introduced in Congress for the purpose of requiring American vessel-owners to employ American seamen to man American vessels, supplemental to the Act which requires that officers of vessels of the United States in all cases shall be citizens of the United States; but on legislation has been had. This subject is, however, foreign to the Immigration and Contract-labor Law, with which this Bureau has to deal; but should an American master or an owner of American vessels enter into a contract with a Canadian seaman, at a foreign port, or assist or encourage the importation or immigration of any Canadian seaman under any contract or agreement, verbal or implied, made previous to the importation or immigration of such Canadian seaman, or if he should solicit the immigration of any seaman for the purpose of giving him employment on arrival in this country, then the Alien Contract-labor Law would be violated and this department would cause the party to be prosecuted with vigor. Should you find a case where a contract was made with a Canadian seaman in the United States by which the seaman was, after his return to Canada, induced to again come into the United States at some future time to perform labor, the Department would proceed in order to have a judicial decision on the subject. As the law stands, the employment on shipboard cannot be distinguished from any other employment upon land under the Alien Contract-labor Law.

This means that what Mr. De Barry has been doing in preventing Canadian seamen from serving in American vessels, where no contracts were made for their services before they entered the United States, was illegal.

There is a general law in the United States which provides that the chief officers of American vessels must be American citizens, but no allusion is made in that law to the citizenship of the seamen. It is barely possible that there are enough American seamen in the lake region to man all the American vessels that sail the lakes, but it is not probable; and it is a well-known fact that on the Atlantic seaboard no American vessel could sail out of port if it were not for the foreign seamen of whom their crews are largely composed. Never in the history of that country has it been possible for even the vessels of the navy to put to sea except with crews only a small part of which were American.

Under the ruling of the United States authorities here alluded to, there is no law that can prevent Canadian seamen serving on American vessels. But they must not contract beforehand for such service. They must first go there and obtain their employment afterwards.

MUNICIPAL CORRUPTION.

It is barely possible that there may be men living who have never heard of boodling and boodlers, but if there are they must have passed their lives in the jungles and recesses of primeval forests, and away from the busy haunts of city life. To those who live in cities and take intelligent interest in municipal affairs, it is no surprise at any time to learn that some of those who are dressed in a little brief authority, and deputed to look after the welfare of the community, have been dishonestly lining their own pockets at the expense of the tax-payers. When Boss Tweed, the prince of boodlers, was detected in stealing millions from the people of the city of New York, he very naively enquired. "What are you going to do about it?" And that is just the question all good citizens are asking each other when they discern Boss Tweeds in their midst.

In a recent number of the Forum this matter is discussed at considerable length. The article relates some characteristic experiences where contracts could not be effected with city officials where only straightforward and honorable methods were observed, and where they were obtained by corruption. In speaking of the methods by which officials are bought—of the science of municipal corruption, the writer says :—

As to the scientific perfection of the system and its safeguards, let me suppose that a typical city council is about to undertake some important public improvement—water-works, for example. Suppose, further, that all the piping, excavation, brick-laying, and other work for which specifications can be prepared, and for which the general public can compete, have been eliminated and advertised to be let to the lowest bidder. There still remains the pumping machinery, which may be controlled by patents or built according to special designs prepared and owned by the contractors, or in some other way so managed that the rival contractors bid not on the same detail in general competition, but each on a different detail claimed by the proposer to be the best and so controlled by himself that no one can bid against him. Such a case involves all the necessary elements for a corrupt deal, which are, first, an amount involved of sufficient magnitude to conceal a profit large enough to afford a corruption fund and still leave a profitable margin to the contractors; secondly, absolute ignorance on the part of the general public as to the actual necessary cost of the proposed work or of the comparative working economy and efficiency of rival systems; thirdly, the certainty that whichever system be adopted, the desired work will be accomplished; fourthly, the fact that the lowest first cost may not indicate the most desirable plan since that may be more that offset by the greater durability or greater working economy of some other plan; and, fifthly, the fact that since there would be only one system established in the community, no subsequent comparison with others could ever enable the public to judge whether it had been imposed on.

All these elements invite corruption, and when they exist together the public may know positively in advance that corruption will be attempted, and in all likelihood successfully attempted. If the council of twelve men contain no mechanical engineer or skilled mechanic whose opinion carries special weight, and the contest be confined to two rival systems, the simple problem presented to the rival agents—for principals seldom personally engage in these contests—is how to get seven votes. These must be secured before the bids are submitted, because the nature of the bid will be largely determined by the number of votes secured. If the agent knows that eight or ten men are prepared to stand by him, he may raise his bid with impunity; but if he have only the bare seven, he must be more circumspect. If he have not the seven definitely pledged—and every experienced agent counts as against him every man who is not pledged for him—he puts his bid at the lowest price possible in the hope that public opinion, when the bids are opened, will bring the more respectable men to his side and enable him to get in one or two of the other sort.

In approaching such a council the agent takes a few days to look over the ground, calling on each member at his place of business and if possible at his home, in the meantime learning all he can learn of the circumstances, associations, business, and personal history of every man. At the end of his round he will have them correctly classified, and will know much more of the strength of character and of the influences likely to affect every one than they know of themselves or of each other He is then ready to begin operations. His first care will be for the four directly purchasable votes, and he must decide whether he will engage them directly or through the boss. If he intends to "knock down" he will prefer to deal directly with the men, since he may be able to bargain with them for, say, one thousand dollars each, and to double this sum in his accounts with his firm. On the other hand, if he does not engage the boss his rival will engage him, and there will be a struggle between himself and the boss to hold them. The boss will readily ascertain what he has offered and will offer more, whereupon his men will promptly become dissatisfied and will demand a higher price. Or they may pretend that more has been offered, a contingency so common in the trade that the dishonest agent who has been compelled really to pay out all he has charged, sometimes recoups himself by telegraphing home for "more mud" at the last moment, on the ground that his men are deserting him and must be held, when in fact they are as steadfast as mountains. The "honest" man in this business is the man who will stay bought. If the agent, instead of himself approaching the men, decides to deal through the boss, he will, unless he is very reckless, charge his company with only the exact sum paid, since the boss, of course, would make no secret of the matter with the principals should any question arise. The boss has his own reputation to maintain. The agreement is with the boss for so many votes for a given sum, a certain amount paid down and the remainder contingent on success. Of course arrangements are sometimes made that are wholly contingent; but an aggressive agent, accustomed to win, will usually prefer to make an advanced payment, since that gives him a better hold on the men. This arrangement is preferred by the members also, and it possesses the additional advantage of dividing the payments and so averting suspicion.

Having secured the four purchasable votes, the agent directs his attention to the doubtful men. Of these the boss, if the agent deal through him, will tell him frankly whom, in his own opinion, he can "handle" and whom he cannot. The latter group the agent undertakes to handle himself. If they are timid or inexperienced he may try to reach them through intimate friends. This method is sometimes necessary, but it is always dangerous. A man hanging on the verge of dishonesty and looking over the precipice will generally prefer to fall into the arms of a stranger whom he never expects to see again than to expose his weakness to those with whom he will continue to associate. And here appears the craft of the agent. To him the comings and goings of his intended victim are known. They meet frequently in apparently casual ways, and a friendly acquaintance is established. Perhaps the member of the board takes a business trip to a neighboring city. The agent happens to be on the same train; they stay at the same hotel; they dine together—and the agent is a noble entertainer; they visit the theatre, and after the theatre a wine supper does the business. The victim grows confidential and lays bare all his trouble; he is in debt and his creditors are pressing; he is trying to borrow money and he has not succeeded. The agent sympathizes with him; tells him that money is cheap and abundant and that he should have no trouble. He inquires into the security offered, says it is ample, and that he knows plenty of men who would jump at it. The next day he inquires and finds such a man; if neces-

sary, the man is produced and the loan is made, of course on security entirely inadequate in any real business transaction. With some natures this method is best. Not a word has been said about a vote, but the agent knows that he has bought one. The victim, when he comes to reflect on it, knows it also, and the more honorable he is the less inclined he feels to vote against the interests of one who has so obliged him. Sometimes the agent bluntly proposes to "lend" the money himself, the nature of the agreement reached depending entirely on the character of the victim as developed under pressure. These transactions are not usually large; the small politician generally has no great credit, and cannot owe and does not handle large sums; but the agent, if he chooses, can readily pay him a few hundred dollars, charge twice the sum to his company, and pocket the difference.

When by such methods the agent has received pledges from at least three of the debatable men he considers himself reasonably sure of the contract. Knowing his own situation, he is sure that his rival cannot have made any such progress as would justify him in large advances, and he feels certain that what has been done, backed by social influence and perhaps occasional "tips," will keep his men straight and win the contract. He endeavors, however, to get the fourth debatable man so as to make eight votes secure and to guard against the ever-present danger that one of his men may "fall down" or "squeeze" him in the belief that his single vote is essential. An experienced manipulator prefers to buy outright votes enough to win. Then he can consult freely as to the highest figures at which he may place his bid without compromising his friends. This the shrewd agent always looks out for, having often to restrain rapacious members who would have him raise his price that he may get more to divide with them. When corruption is discovered it is usually brought to light through recklessness in this particular.

While this work has been going on an entirely different "campaign," based on reason and argument, has been carried along with the incorruptible members of the board and with the public, whose good opinion and influence are most strongly desired to strengthen and sustain the corrupt men. The incorruptible members of a public body include those who are conscientious and those who are simply strong, the latter usually men of wealth and standing who do not need money and would promptly resent any approaches of an improper nature. Such men are moved either by reason or by prejudice, perhaps as often by one as by the other; but they cannot be corrupted. No improper proposal is ever made to any official who does not himself make the way easy, and the weak are always well prepared, either by the methods that I have described or by their own instincts, before actual corruption is attempted. The "campaign of education" for the public is often carried on by a subordinate of the agent who knows nothing whatever of his chief's corrupt operations—frequently by some man of special local information and influence. Sometimes reckless agents, sure of their "boodle" votes, entirely disregard public opinion; but the most successful bribers are those who have the greatest skill in combining effective bribery with all possible attention to proprieties. The present condition of State and municipal government has developed a species of man possessing these qualities to such a high degree that nearly all bribery passes undetected. The old and gross forms of corruption would be exposed at once. The manipulation of legislatures differs from the manipulation of smaller bodies only in the complication involved in the larger number of men concerned, the effects of conflicting or interfering bills, party politics, and a hundred similar conditions.

As to the classes of men most easily accessible to corrupt influences, agents invariably agree. Easily first are leaders of workingmen's or farmers' political movements. In estimating an elected body, the members elected on such tickets are placed on the directly purchasable list without much inquiry. Next come the editors of country newspapers and newspapers in small cities; then country lawyers and that class of city lawyers who usually seek such positions, though lawyers and editors as a rule prefer to gloss over the transaction by the pretence of professional services which deceives no one concerned. Religious profession rarely makes much difference with politicians, although it tends to render them more cautious and leads them to insist on indirect methods of approach when both parties perfectly understand the end to be reached and are equally anxious to attain it. Nothing is more common with such men, when receiving money for "services" than the expression, "Now you understand perfectly that this has nothing to do with my vote"; and if they receive a better offer from another quarter and the outraged agent reproaches them with deserting him, they quote his own language against him! "The religious sharps" say the agents, "won't stay bought." Perhaps they have mushy intellects which really deceive their owners in such matters, but the few clergymen who drift into practical politics can almost always be bought by indirect methods. Farmers are likely to fall an easy prey to unaccustomed social attentions, and are exceedingly susceptible to a form of influence of which I can only hint in these pages, but which is constantly employed with success.

The only remedy for municipal corruption is to elect no man to office who is not free from debt. Moral reputation is a flimsy security for conduct; financial competence is a very good security indeed. A man out of debt and with a bank account, even a small one, is not likely to be corrupted. Corruption involves slavery to the corrupter, and all men love freedom. The most venal man living prefers at the last moment to vote as he pleases. The private circumstances of nominees should therefore be a matter of public discussion. When State and municipal legislatures are composed entirely of men whose income habitually exceed their expenses the problem of corruption is very nearly solved. Until then we may look for bribery wherever water-works, gas-works, or electrical plants are to be established, in the granting of street franchises, in the adoption of school text-books, in the regulation of licenses, and, in fact, in most circumstances where legislative or State action affects large private interests. The remedies which seem to me likely to be most effective are wide publicity of the conditions that invite corruption and careful scrutiny of the financial condition of candidates. The main point is to remove temptation, on the one hand, by selecting officials from the class of men that are financially independent, and, on the other, by giving them the fewest possible opportunities to exercise official discretion in a manner to effect private interests.

EDITORIAL NOTES.

An important political meeting was held at Orangeville, Ont., a few days ago, at which several members of the Dominion Government made addresses. Mr. John F. Wood, Controller of Inland Revenue, was one of the speakers, and in discussing the tariff, according to a report in the Empire, said:

There is a false impression with reference to the Conservative party and the National Policy. This false impression is an injustice to both. The National Policy was not adopted from choice. The United States had a high tariff wall. Canada at that time had a low wall. The Government had done everything to get the United States to lower their wall, and, failing in that, had found it necessary to raise a higher wall of their own. It was then that Sir John Macdonald found it necessary to move that historic resolution of 1876. It has never been intended that the National Policy should be perpetuated.

Regarding this speech the Empire said:

Hon. Mr. Wood has not, we may hope, addressed his last audience in Western Ontario; and his practical speech is a clear and sensible enunciation of Canada's position on the commercial questions of the day.

All of which shows that as wise a statesman and as shrewd a politician as Mr. Wood is, he does not seem to have ever caught on to the fact that it was the deliberate intention of the people of Canada to adopt protection as a permanent policy; and that the Empire is always ready to toss up its hat and hurrah for any speaker for its party, whether he talks sensibly or not. It is ridiculous to say that it was never intended that the National Policy should be permanent. It is here to stay.

Mr. H. C. Jones, M.A., of this city, has an interesting and useful article in Minerals, a New York monthly, regarding the nickel mines of Canada. He points out the great want of a customs smelter for the Sudbury district. Such a smelter he likens to a mill in a wheat-growing district. Of what avail is it to grow wheat if there be no mill to grind it? As one illustration of the promising future that is in store for nickel, the writer quotes from The Engineering and Mining Journal of a recent date, in which it is announced that "the contract for over 10,000 tons of hull and protective deck-plate, for the new warships, Brooklyn and Iowa, has been awarded to the Carbon Steel Co., of Pittsburgh, Pa. The protective deck-plating is all to be nickel steel, the percentage of nickel to be about 3 or 4 per cent. The value of the work approximates about $1,000,000. In order to fill that contract they will have to come to Sudbury for the nickel: 10,000 tons of plate would require 400 tons of nickel, equal to 800,000 pounds at 62 cts., or $496,000. It would require about 12,000 tons of ore, reckoning the nickel at 3 per cent. The Ontario Government is censured for its do-nothing policy in regard to the development of a mineral that is bound to play an important part in the commerce of the world, in spite even of the Government's masterly inactivity.—Toronto World.

Why censure the Ontario Government alone? It is true Mr. Mowat has declined to assist, as he might do, in developing our mineral resources—our nickel mines; but those mines would be most wonderfully developed, and we would also have smelters for reducing the ore to matte, and works for separating the nickel from the other metals contained in the matte, and for refining the nickel, making it available for commercial uses, if the Dominion Government would but lay an export duty upon the nickel contained in the ore and matte equivalent to what the United States levies upon imports of refined nickel, that is, ten cents per pound. According to the World two Yankee war ships now building will require 800,000 pounds of nickel for their armour. On this quantity alone the export duty of ten cents per pound would put $80,000 in the Dominion Treasury; and the enforcement of such a duty would enable the Government to pay a large bounty upon the production of Canadian made nickel steel. If the World is so anxious to have our mineral resources developed, why does it not demand some adequate action on the part of the Dominion Government?

Ex-United States Senator Henry B. Payne, Judge Stevenson Burke and others, of Cleveland, are erecting a plant for the reduction and refining of nickel and copper from matte that will be brought from the Sudbury district of Canada. At present nearly all the nickel is refined at Swansea, Wales. The McKinley Act made nickel matte free of duty, and hence this refinery that will give employment to a large number of American workmen. The nickel mines of the Sudbury district are the richest in the world, so far as known, and are owned largely by capitalists of Cleveland and Akron, Ohio.—Tin and Terne.

The nickel mines of Sudbury are the richest in the world, and an establishment for refining the matte, which would give employment to a large number of Canadian workmen, is an impossibility in Canada at this time. How long, oh Lord, how long will this blindness last? The McKinley tariff made nickel matte free of duty, while it imposed a duty of $200 per ton on refined nickel, hence the erection of a nickel refinery at Cleveland. An export duty of $200 per ton upon the nickel contained in Canadian ore and matte would soon give us a refinery which would give employment to a large number of Canadian workmen, and would, at the same time, knock the McKinley duty on refined nickel into smithereens. Impose the duty.

It is surprising how much more power the Local Legislatures have under the British systems than under the American. Here the Lieutenant-Governor of a province rarely vetoes a bill. During the last session Governor Flower, of New York State, vetoed 121 bills passed by the Legislature.—The Empire.

Very funny indeed. Because our Lieutenant-Governor does not have occasion to frequently veto bills, the Local Legislature has much more power than the Legislatures of American states, where the Governor vetoes many bills. If our Lieutenant-Governor rarely vetoes a bill it is not because the Legislature has power to prevent him, for he has the undoubted power to do so; and in these respects our system is quite similar to that of our neighbors.

A convention for the reciprocal protection of trade marks and designs has been ratified between Great Britain and the republic of Ecuador. It is open for any of the British colonies to be included within the convention, if they so choose, and an order in council has been passed asking that Canada may be included as a contracting party.

They who are ever looking for the American capitalist whose arrival will develop our iron mines, and who believe he is sure to come because President Cleveland will take the duty off iron ore, may be able to reconcile their hopes with the facts that hundreds of iron miners have been paid off in the Lake Superior districts, several mines have been shut down, and ore has been offered cheaper than ever before known in the history of American iron mines.—Mining Review.

Congressman John De Witt Warner, writing in the last number of the Engineering Magazine, says that in the next American tariff iron ore will be on the free list. If this proves true there will be rejoicing in Canada.—Montreal Herald.

This means, we presume, that the rejoicing would be on the part of the owners of Canadian iron mines, who would then have access to the sixty million market. There are no well-developed iron mines in this part of Canada, and the iron mines of the United States are in such condition of development as to be able to produce ore enough to make some ten million tons of pig iron per year. But notwithstanding this wonderful development there is much depression in the trade, and work in many of the highly productive mines has been suspended, as see by the following from the Cleveland Iron Trade Review:—

The prophecy of ore men that sales late in the season will be rather at an advance upon these figures than below them, is based on the steady maintenance of the low rate of ship-

ment, the curtailment of operations at a number of mines, including several important producers, and the bar to the shipment of unsold ore, or to the mining of any considerable quantity of it. It is fair to reckon that monthly payments on ore sold were bringing three times as much money into Cleveland a year ago as is now being received on ore account. Curtailment goes on steadily at the mines. Of the 24 Gogebic shippers of 1892, only ten have shipped ore thus far. In the Crystal Falls district on the Menominee, there is a decided cutting down of force. The suspensions at the Dunn and Claire, both Schlesinger properties, are to be followed, it is reported, by curtailments at the Sunday Lake, on the Gogebic, and at the Buffalo group on the Marquette.

How about the "rejoicing in Canada?"

An excellent opportunity for attracting the attention of Canadian investors to the desirable securities offered for sale in many parts of the South is presented in a bill now *pending* in the Canadian Parliament. This measure requires that all securities in which the savings banks can invest must be described and listed. The idea is to prevent the money of any savings institution being put into unknown or "wild-cat" securities. Mayor Latrobe, of Baltimore, with his characteristic energy, advised the Speaker of the Lower House of Parliament of the excellent character of Baltimore bonds, with the request that they be included on the authorized list. This would seem an excellent example for other corporation officers to follow.—Baltimore Manufacturers' Record.

Of course it is a wise measure to require that all securities in which our savings banks can invest should be properly described and listed; and it is a wise thing for the Canadian Parliament to do; but a wise thing which our law makers have not done is to impose an export duty on nickel ore and matte, and saw logs, and to require the railroads to pay a duty upon their steel rails. If these were done money would become so valuable in Canada that it would remain at home and become invested here in manufacturing enterprises.

The daily papers report the arrival in Toronto of a train load of machinery intended for the equipment of a rolling mill to be erected in this city; and we are told that the Canadian market will absorb all the iron that could be rolled in it. We are always glad to note the establishment of a new industry, and we hope that the promoters of this one will be abundantly recompensed for any investment they may make. Whether it will prove a success depends somewhat upon the quality of iron it will produce. There are already three rolling mills in operation in Ontario, and it is said that they have capacity to turn out much more iron than what they actually make. These mills make iron of scrap; and while their product is well suited to many of the purposes to which it is put, there is a constant demand for a quality of iron which they do not produce, and which, of course must be met by imports from abroad. For all ordinary purposes the iron rolled in Ontario mills is good enough, but for some other purposes it will not answer at all. If the proposed new mill will produce a first-class refined iron, uniform in strength and tenacity, there should be a demand for it which would keep the mill in full operation all the time. If it is intended to work over scrap and to produce nothing better than what can now be had from other mills, the success of it may not be as unbounded as its projectors hope for. Existing mills have capacity to make all the iron for which there is any demand—that *is, iron of common qualities. The addition of another mill,* if built to produce only such qualities, could but discourage the trade and result in disappointment. The fact is, as long as the duty upon wrought scrap is only $2 per ton, and the foreign supply of the article holds out, no puddled iron will ever be made in Canada. Heating scrap and rolling it into bars does not constitute manufacturing iron.

According to the latest report made to the English Board of Trade and covering the year 1891, strikes in Great Britain are more extensive and costly in proportion to the population than in this country. During the year mentioned there were 893 strikes, affecting 4,500 establishments and about 300,000 workmen, and 13 lockouts, affecting 48 establishments. Of these strikes, 156 affected the cotton spinners and 120 the colliers, the engineers participating in 33, the ship builders in 41, boot makers in 35, and a large part of the remainder were in the building trades. The London tailors had 20,000 men on strike, the cotton spinners in a single county turning out 27,000 strikers. More than half the labor troubles were over the question of wages, only 3 per cent. being undertaken for shorter hours and 1 per cent. against non-union labor. In one strike at Cardiff, extending over five weeks, 5,000 laborers were concerned, and at about the same time 2,000 dockmen at Liverpool were engaged in the struggle. In all, 369 strikes, affecting about 70,000 workmen were successful. Less than 200 strikes were partially successful. The unsuccessful strikes were 263 in number, but concerned over 90,000 employees. The attempt to secure reliable statistics concerning the direct monetary gain or loss to the strikers has not been entirely successful, as many estimates disagree noticeably. But one-third of the establishments furnished data. If the *proportion would hold good for the others, the capital which* was temporarily paralyzed amounted to about $140,000,000; while the actual loss incurred in the mere stoppage and resumption of work alone reached $160,000; the loss of the workmen's wages during the strikes was at least $8,000,000, and perhaps exceeded $10,000,000. During the year 1892 it is probable that these figures were largely exceeded. The Lancashire cotton strike alone, which lasted for twenty weeks, it is estimated, cost the operatives alone more than $7,000,000 in wages, while the loss to manufacturers must have been at least as great and probably much more serious, for business recovers but slowly from such stagnation as followed the strike. One benefit, however, has been gained, and that is the establishment of a system of arbitration, which was provided for in the agreement between the manufacturers and employees by which this great strike was settled. It is not improbable that if it proves successful in settling disputes between labor and capital, the system will be generally adopted by other trades, and thus many of the disastrous consequences of these widespread and bitter contests will in future be avoided.

According to an old English report, there is a curious item in the Public Records, which is dated February 7, 1737, and runs as follows: "Jane Vanet, of the Parish of St. Anne, Westminster, widow, hoop petticoat maker. The specification describes a new invented hoop petticoat, with foldings, whalebone and metal joints and strings, for contracting the compass of a petticoat from four yards in circumference to two yards, and thereby causing less inconvenience to the *wearer in churches, assemblies, coaches and chairs.*" *And* yet, in view of the crinoline revival, somebody suggests the invention of a collapsible crinoline as a new idea.

THE largest contract for fuel oil that has been made for some time is reported from Pittsburg as having just been completed between the Crescent Pipe Line and the Pennsylvania Steel Company at Steelton. The contract is for 1,000 barrels daily. The claim that that oil can be used for making steel at higher prices than that article of fuel is commanding at present, and still compete with coal, is creating considerable attention along that line.

FOR some weeks past Mr. George E. Drummond, the president, on behalf of the Canada Iron Furnace Company, of Montreal, has been in communication with the Mayor of Toronto looking to the establishment of a large blast furnace plant by that company in this city. A few days ago Mr. Drummond wrote the following letter to the mayor:

We understand that certain parties now negotiating with Hamilton have stated that it is their intention to use American ore in their furnace. This means that the establishment of a blast furnace would be of little value to the community in which it is situated, inasmuch as the number of employees attached to the furnace itself will be comparatively small, and certainly not of sufficient account to warrant a large bonus being granted.

As you are aware, the bulk of the labor employed in the carrying on of the pig iron industry will be for the working of the mines, and the production and shipment of ore and fuel. If this work is done in the United States, the enterprise, as stated, will be of comparatively little value to the Province of Ontario, and to the City of Toronto.

In our opinion it would be unwise for either Toronto or Hamilton to make arrangements with any concern until prospectors have time to prove beyond a doubt that a full supply of iron ore can be secured in your province.

We are fully aware that a great number of mines have been located, and in many cases the ore is of exceptionally good quality. We have yet to learn, however, that any of these mines have been fully proved to be capable to supplying the necessary quantity of ore to keep a furnace of 100 tons daily capacity running. You understand that a furnace of this capacity will require from 75,000 to 100,000 tons of ore per annum, and the securing and delivering of this large quantity of raw material would be of incalculable benefit to your city, and would certainly warrant you in making a very liberal grant of land for the erection of a blast furnace, inasmuch as all the supplies required by the men at the mines would unquestionably be drawn from the furnace centre and the benefits would be very far reaching; whereas, as already pointed out, if all this work is done in the United States American labor will be benefited at the expense of Ontario.

In our opinion the settlement of the matter should be delayed for at least six months, and time given for a full and complete investigation into the ore question. We are willing to take up this matter, provided the City Council of Toronto can give us some satisfactory assurance that in the event of the investigation proving satisfactory the City of Toronto will be ready to deed us a sufficient acreage of Ashbridge's marsh, together with sufficient perfected land to admit the erection of a furnace and accessories, also necessary bridges, etc.

To take up this work on any other lines than the foregoing would be to do it on a speculative basis, and we are not speculators. Our desire is to establish an iron industry in your centre, but it must be on solid business principles. We have no wish to go into the venture, for the sake of merely securing the land or a bonus, nor yet with the idea of unloading furnace plant.

Discussion of the question as to whether Ontario is to have a blast furnace industry has brought the matter so prominently to the notice of capitalists that it seems that all that is yet to be done to ensure the consummation of the event is to demonstrate the fact Mr. Drummond asks for—that Ontario ore can be had in sufficient quantities and at reasonable cost. It has been asserted time and again that we have the ore in unlimited quantities, that it is of the right sort, and that it can be easily and cheaply worked. If these assertions are anything more than talk, let those who are interested satisfy Mr. Drummond as to their correctness, and we will soon have the industry.

WHEN Mr. Foster is remodelling the tariff let him increase the duty upon scrap iron to not less than $10 per ton, and that will give us a puddled iron industry; and let *him put a* duty of $10 per ton on steel rails, and give a bonus of $5 per ton upon the home production of the article, and that will give us a steel rail industry and a pig iron industry also.

WARDEN MASSIE, of Central Prison, Toronto, was in Montreal a few days ago endeavoring to secure the contract for the steel and brass bedsteads needed by the Royal Victoria Hospital in that city. In an interview with a Herald reporter Mr. Massey said that he prided himself upon the bedsteads and wire mattresses made in Central Prison. Most of them are from his own designs and covered by his own patents. For the past thirteen years he has been adding to the industries carried on in the prison, and now within its walls are a woollen mill, in which carding, weaving and spinning are done; a department for the manufacture of steel bedsteads; a tailoring shop; a shoe-making shop; a broom factory, turning out 175 dozen brooms per day, and a cordage and binder twine factory. We are not informed if Mr. Massey captured the order for the bedsteads for the Montreal hospital—we most sincerely hope that he did not—but if the ability to cut prices far below what should obtain where free labor is employed would give it to him, it is probable the Montreal hospital will be equipped with bedsteads made by prison labor. There are quite a large number of factories in Canada employed in producing this particular line of goods. Large capital is invested in them, and the proprietors have to pay whatever taxes may be assessed against them. They give employment to a large number of free Canadian workmen, who also pay taxes. And yet we see a representative of the Ontario Government out on the road like a commercial traveller for a private enterprise, soliciting orders for prison-made goods. We quite agree with the argument that prison convicts should be employed at some useful occupation, but our contention is that the products of convict labor should not be brought into competition with the products of free labor. It is a gross injustice both to the manufacturer and the labor he employs.

THE first Bessemer steel converter used in America is on exhibition at the World's Fair at Chicago. It is shown by the Cambria Iron Company, of Johnstown, Pa., and was used by that company during their early experiments with the pneumatic process for making steel from 1858 to 1861. We regret that we are able to announce that the first Bessemer steel converter in Canada is not also on exhibition at Chicago, simply because it has never yet been made. There are hundreds of converters in use in the United States, but not one in Canada. This is not because we have no use for Bessemer steel, for there are several million tons of it now in use in Canada, but because no effort has ever been made to establish the industry here.

THE Winnipeg Commercial, speaking of the financial failure of a piano manufacturing concern in Chicago, caused by the failure of another similar company, says that the event has some interest to the people of Winnipeg in that some time ago an agency of the Chicago concern was established in that city, and a number of the Yankee pianos located there. These pianos were sold at ruinously low prices, by which the legitimate local trade suffered severely. The pianos were guaranteed for ten years, but now the concern has failed and the guarantee is worthless. In Winnipeg the trade had been nearly all in Canadian pianos, very few foreign instruments having been imported until the introduction of those from Chicago. This incident emphasizes the importance of a specific duty to protect not only Canadian manufacturers but the Canadian public against fraud. If there was no specific duty on pianos the country would be flooded with cheap, trashy goods, and there would be no redress.

THE importance of a specific duty on imports is emphasized in an incident related in the New York Iron Age. A well known southern house bought goods from a Northern manufacturing concern and paid for them before delivery. The following letter from this defrauded house illustrates the desirability of excluding trashy goods from our market:

Some time ago we bought from . . . . . some rubber carriage cloth. It proved utterly worthless. We returned it to them, but, unfortunately, we had paid them for it, and they have refused to make us any allowance whatever on the same. They claim that the goods were O.K., but if this were even granted to be the case they should then be willing to take them off our hands. The cloth was rotten and utterly worthless, however, and the very worst goods of the kind that we have ever had in our house. We think that such fraudulent transactions as these should be made public.

SURPASSING as the American exhibits are, and emphatic as their testimony is to the progress of American invention and mechanical skill, it must be admitted that in many lines foreign exhibitors have reinforced what otherwise would have been weak and inadequate. In some departments it is essentially a foreign fair. Nothing in iron and steel is comparable to the magnificent Strumm exhibit of structural material. Great Britain is very scantily represented in this industry in which she so long led the world. And it is certainly cause for regret that names for which foreign manufacturers and engineers will ask first of all, in seeking out the United States exhibits in iron and steel, are not to be found in any of the great halls. Carnegie is not represented; the Illinois Steel Co. likewise is absent, and on the Bethlehem Iron Co., the Cambria Iron Co., and the Crescent Steel Co. devolves almost entirely the maintenance of this country's name as the greatest iron and steel producer in the world. The enthusiasm of foreign producers is contrasted again with the apathy of American interests, in the splendid exhibit contributed to the Mines Building by the Broken Hill Proprietary Mining Co., of New South Wales. The whole mineral exhibit of New South Wales, taking up 10,000 square feet, is in fact one of the foremost features of the mining display, one that will have recognition from the casual sight-seer, as well as the expert. While the iron mining interests of the Lake Superior region are creditably represented, a few producers must have the credit for saving the exhibit from being entirely unworthy of that wonder of iron mineraldom. Specimens of the various deposits are in place, and views of the more famous mines, prominent among these being huge paintings of properties grouped about Negaunee and Ishpeming. The models, showing timbering systems and methods of operation, are not completely in place.—From Trade Review.

WHEN Andrew Carnegie left Pittsburg a few days ago for New York and thence to Europe, a newspaper reporter asked him about the condition of the iron and steel business. Mr. Carnegie answered thus: "I do not need to say anything about it; it speaks for itself. One pound of steel for one cent. The robber baron has ceased to rob and is now being robbed. The eighth wonder of the world is this—two pounds of iron-stone purchased on the shores of Lake Superior and transported to Pittsburg; two pounds of coal mined in Connellsville and manufactured into one and a-quarter pounds of coke and brought to Pittsburg; one-half pound of limestone mined east of the Alleghanies and brought to Pittsburg; a little manganese ore mined in Virginia and brought to Pittsburg, and these four and a-half pounds of material manufactured into one pound of solid steel and sold for one cent. That's all that need be said about the steel business. The capacity of the country to manufacture is beyond its wants. Some furnaces and mills must stop, others must restrict production, and until that is done we must expect the continuance of low prices. It is the same all over the world. England is even worse than we are, but she has endured the depression so long that she has now closed many of her works. The longer all parties continue to run the lower prices will become, and the more disastrous the stop will be to some of these when the end comes."

THE taxation of foreign goods would be an excellent policy if it could only be put into operation. The trouble is that the goods must become naturalized before we can get at them to levy the tax. Some of our amateur economists seem confidently to believe that goods can be taxed while they belong to foreigners. The only people we can tax are ourselves.—The Globe.

Certainly in most instances the foreign owner knows that he must pay the whole or a very large part of the duty before he can send his goods into Canada; and he does this by selling them for export for less than he would sell them for for home consumption. Like the American manufacturers of sewer pipe, for instance, who sell their goods at a much greater discount to Canadian buyers than to American consumers.

The comparative cost of hauling by water and by rail is shown by the recently-published report of Gen. O. M. Poe, engineer officer in charge of the Sault Ste. Marie ship canal. According to this report, the average rate per ton mile on all the freight carried through the canal in the season of 1892 was 1.31 mills. The amount, 1.31 mills, paid by the shippers, was exactly one-third of the cost to the Pennsylvania Railroad for each ton mile carried on its main line division last year.

The production of beet sugar in the United States has advanced from 12,004,838 pounds in 1892 to 27,083,322 pounds in 1893, and the applications for bounty on maple sugar this year will be about 3,000,000 pounds. The sorghum production is 386,000 pounds, and the cane production about 450,000 pounds.

Sir Oliver Mowat has now established the manufacture of binder twine at the Central prison. He says he hopes that the result will give a return equal to 50 cents a day for the men employed. Which is saying that, calculating wages at 50 cents a day, paying nothing for rent, light, heat, insurance and superintendence; practically nothing for capital, and asking no profit, he can sell binder twine at lower prices than have been charged by the regular manufacturers. The scheme was a humbug and a fraudulent proceeding from the start. A cry was got up that the manufacturers of binder twine were fleecing the farmers. The charge was never made out. If it had been true there was nothing to prevent other manufacturers entering the business. There is plenty of capital watching for opportunities to engage in profitable enterprises. If the farmers believed they were paying exorbitant prices for binder twine nothing hindered them from establishing a twine factory of their own. A great amount of capital is not required. But those who looked into the matter discovered that twine could not be made at lower prices than those current. Sir Oliver Mowat, however, saw an opportunity to do a stroke of political business. He could make binder twine in the Central prison at lower prices than must be charged by those who pay honest labor, who pay for rent, heating, light, insurance, interest on capital, superintendence and management of the business, and who then sell through the regular channels of trade. Then he would pose before the farmers as one who had saved them from the exactions of the monopolistic binder twine makers.—Hamilton Spectator.

Not to be outdone by Mr. Mowat, the Dominion Government are also going into the manufacture of binder twine at Kingston Penitentiary; and other lines of merchandise for the open market are already being made there. This Government competition in manufacturing industries with convict labor may be a good card to play to the farmers, but it is quite rough and uncomfortable for free laboring men with whose labor they compete. Better put the convicts to road-making.

The first step has been taken in the project to build a canal connecting Lake St. Clair and Lake Erie in the purchase of the land upon which the St. Clair end of the canal will terminate. The promoters of the scheme say that all the money necessary to do the work, about $3,000,000, has been already subscribed. The length of the canal will be 14 miles, with a fall of three feet. The use of this canal will shorten the distance from Lake Huron and other western ports to the lower end of Lake Erie over 50 miles, and avoid the most vexatious navigation of the Detroit river. And it would also deprive the city of Detroit of much of the prestige it now has as having a greater tonnage of vessels pass it than any other city in the world.

Inventions.

CANADIAN PATENTS.

The following patents have been issued from the Canadian Patent Offices from May 18 to May 31, 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.

42,952 Middlings purified, W. D. Gray, May 18th.
42,953 Cover holder, M. A. Green, May 18th.
42,955 Steam engine valve, L. A. Lemieux, May 18th.
42,956 Filter, J. H. Drake, May 18th.
42,957 Pulley block, H. Loud, May 18th.
42,958 Street car, F. B. Brownell, May 18th.
42,959 Puzzle, J. A. Schaffer, May 18th.
42,960 Controlling the movement of railway trains, J. E. Kinsman, May 18th.
42,961 Power transmitting device, E. H. Johnson, May 19th.
42,962 Ditching machine, P. Hanlon, May 19th.
42,963 Boiler, F. H. Date, May 19th.
42,964 Temperature regulator, the Consolidated Car Heating Co., May 19th.
42,965 Tail board vehicle spring, F. Nickerson, jr., and H. McClusky, May 19th.
42,966 Cigarette maker, H. C. Kerman and W. C. Kerman, May 19th.
42,967 Street lamp, C. W. Bodkin and G. H. Houser, May 19th.
42,968 Making composition targets, H. A. Penrose, May 19th.
42,969 Truss, C. Colves and H. C. Meyer, May 19th
42,970 Handling logs in saw mills, the Chamberlain Mnfg. Co., May 19th.
42,971 Distilling petroleum, the Ontario Standard Oil Co., May 19th.
42,972 Potato digger, W. E. Roche and A. L. Poor, May 20th.
42,973 Truss, G. J. Slayton et al, May 20th.
42,974 Valve, Consolidated Car Heating Co., May 20th.
42,975 Valve, Consolidated Car Heating Co., May 20th.
42,976 Whip, F. Foley and P. H Kerwin, May 20th.
42,977 Hay press, A. Gibeault, May 20th.
42,978 Pipe hanger, F. G. and G. L. Scott, May 20th.
42,980 Bottle sealing device, W. Painter, May 20th.
42,981 Gate latch, P. T. Rapson, May 20th.
42,983 Sewing machine, H. A. Tracy, May 20th.
42,984 Anti-friction bearing, L. K. Jewett, May 20th.
42,985 Bicycle, W. W. Kenfield, May 20th.
42,986 Fence post, L. Heiland and C. E. Bronson May 20th.
42,987 Compound doffer for mangle, T. S. Wiles and M. E. Wendell, May 22nd.
45,988 Power storing attachment for vehicles, A. C. Sotheran, May 22nd.
42,989 Sulky cultivator and weeder, Z. Breed, May 22nd.
42,990 Saw sharpener, W. H. Nogar, May 22nd.
42,991 Can top, C. T. Brant, May 22nd.
42,992 Cinder, dust and smoke excluder for car windows, J. C. Fry, May 22nd.
42,993 Frog or fitting for railway tracks, H. R. Luther, May 22nd.
42,994 Harrow, O. J. Childs, May 22nd.
42,995 Inflated wheel tyre, W. Bowden and R. J. Urquhart, May 22nd.
42,996 Saw stretching machine, M. Covel, May 22nd.
42,997 Shell for high explosives, J. G. Justin, May 22nd.
42,998 Lace fastener, L. Parmelee and P. Van Patten, May 22nd.
43,000 Sand papering machine, C. L. Ruchs, May 22nd.
43,002 Lock box for wheel hubs, S. S. Arnold, May 22nd.
43,003 Maple sap spout, W. A. Kemp, May 22nd.
43,004 Indices, T. C. Brinkley, May 22nd.
43,005 Extract and pull out railway small pegs, Z. Chateauvert, May 22nd.
43,006 Coaling and drying of all kinds of grain in bulk, J. C. Hodgins, May 23rd.
43,007 Paying over or delivering money, O. Lehn, May 23rd.
43,008 Potato harvester, J. N. Cocker, May 23rd.
43,009 Sleigh runners, J. K. and H. Pangborn, May 23rd.
43,010 Air moistening and mutilating apparatus, O. Hoffman, May 23rd.
43,012 Farm gate, J. L. Lancaster, May 23rd.
43,013 Gas regulator, J. Duncan, May 23rd.

43,014 Vapor lamp, W. Stone, et al, May 23rd.
43,015 Plow attachment, G. F. Sanborn, May 25th.
43,016 Two-wheeled vehicle, E. F. Morse and E. T. Turner, May 25th.
43,017 Car brake shoe, G. Sands and T. Musser, May 25th.
43,018 Hot-air heating device, H. Bunker and J. H. McKeggie, May 25th.
43,020 Mattress frame, E. A. Long, May 25th.
43,021 Attachable sleigh runner, J. E. Hobbs and B. M. Wentworth, May 25th.
43,022 Mechanical bell ringer, G. J. Gollmar, May 25th.
43,023 Spring rim for the wheels of velocipedes, W. J. Pizzey, May 25th.
43,024 Stove grate, C. L. Beers and N. C. Arnold, May 26th.
43,025 Skylight, C. J. Garland, May 26th.
43,026 Sheating latch attachment for a planing machine, T. H. Brown, et al, May 26th.
43,027 Car buffer, Gould Coupler Co., May 26th.
43,028 Side guard for street cars, R. Thompson and H. Courtland, May 26th.
43,029 Shackle or coupling for attaching shafts or poles to velocipedes, E. J. and H. B. Merry, May 26th.
43,030 Car coupler, Empire Car Coupler Co., May 26th.
43,031 Crushing mill, F. A. Wiswell, May 27th.
43,032 Combination lock, E. M. Skinner and O. M. Farrand, May 27th.
43,033 Gripper for scaling ladders, etc., P. L. Judd, May 27th.
43,034 Ironing table, M. M. Smith, May 27th.
43,035 Timber loader, E. W. Gurney, May 27th.
43,036 Skate fastening, E. L. Fenerty, May 27th.
43,037 Check valve, G. K. Tower and G. Starrat, May 27th.
43,038 Neck yoke, J. H. Bagnale and H. P. Swensen, May 27th.
43,040 Stone caster, J. H. Hall, May 27th.
43,041 Tire for cycle, R. Stretton and H. A. Mathercott, May 27th.
43,042 Musical instrument, J. B. Galloway, May 27th.
43,043 Block setting rack for sand papering machine, C. L. Ruehs, May 27th.
43,044 Oiling the axles of coaches and cars without the use of packing, S. Walker, May 27th.
43,045 Hitching device, J. E. Terry, May 27th.
43,046 Inclined furnace grate, W. A. Roney, May 27th.
43,047 Casket handler, J. McCarthy, May 27th.

43,049 Plow colter, G. A. Lambert, May 27th.
43,050 Upright piano backs, J. W. Reed, May 27th.
43,051 Mineral oil burner, J. A. Vagner, May 27th.
43,052 Hydro-carbon burner, J. H. Lammert and W. A. Jeavon, May 27th.
43,053 Gas pressure governor, F. Peterson, May 27th.
43,056 Clip for single and double tree, E. H. Sawyers, May 27th.
43,057 Feeding threshing machines, G. S. Richardson, May 29th.
43,059 Stove for heating water in circulation, M. Galley, May 29th.
43,060 Screen or seive for use in stamp batteries, C. Raleigh, May 29th.
43,061 Lawn mower, A. R. Woodyate, May 29th.
43,062 Pencil sharpener, G. Diez, May 29th.
43,063 Tap and filter for oil cans, W. Hardoin, May 30th.
43,064 Preventing vegetables from burning on the bottom of saucepans, F. R. Graham, May 30th.
43,065 Watchman's time and station recording apparatus, J. A. Tilden, May 30th.
43,066 Pile driver, G. W. Cowen, May 30th.
43,067 Regulating the supply and pressure of gas, D. Wilson, May 30th.
43,069 Oil burner, E. R. Weston, May 30th.
43,070 Two-wheeled vehicle, J. O. Bitz, May 30th.
43,074 Motor actuated by ether or other volatile liquid; P. de Susine, May 30th.
40,075 Ether or other volatile liquid steam motors, utilizing the heat lost by gas or other motors, P. de Susini, May 30th.
43,076 Motor actuated by ether steam, without fire-place or other volatile liquids, to be added to ordinary steam motors, P. de Susini, May 30th.

40,077 Looping machine, D. Mans, May 30th.
43,078 Agraffe for pianos, J. B. Mitchell, May 30th.
43,079 Swinging sewing machine treader, C. W. Smart, May 30th.
43,080 Typesetting machine, J. I. Haynes, May 30th.
43,081 Straightway valve, E. H. Lunken, May 30th.
43,082 Decorating and stripping waste matter from textile plants, A. W. Goethals, May 30th
43,083 Book holder, J. A. Sinclair, May 30th.
43,084 Nut and pipe wrench, A. Fletcher, May 30th.
43,085 Trimming and ornamental articles of fur as substitute for lace, G. Szuhanek, May 30th.
43,086 Cash register, F. H. Seymour, May 30th.
43,087 Grocers' caddies, C. Toohey, May 30th.
43,088 Toy savings bank, A. Colton, May 30th.
43,089 Music rack, I. W. Zavadil, May 30th.
43,090 Syringe, C. E. Longden, May 30th.
43,091 Type casting and dressing machine, J. G. Payyer, May 30th.
43,092 Preventing the re-filling of bottles, E. Guerbois, May 30th.
43,093 Vehicle brake, W. H. Grant, May 31st.
43,094 Ventilator, C. H. Norton, May 31st.
43,095 Lock, E. C. Smith, May 31st.
43,096 Land rotter, E. Kime, sr., May 31st.
43,097 Railway and tramway locomotives, J. J. D. Clemmson, May 31st.
43,098 Hackling and preparing fibre, T. B. Allen, May 31st.
43,099 Fastening for rail joints for railroad, E. L. Fenerty, May 31st.
43,100 Spring bed, H. L. Day, May 31st.
43,101 Locking gear for window sashes, R. R. Cowl, May 31st.
43,102 Knob attachment, H. J. P. Whipple, May 31st.
43,103 Sweat-band for hats or caps, W. Wyndham, May 31st
43,104 Paper cutting machine, J. G. Payyer, May 31st.
43,106 Fountain marking brush, Fountain Marking Brush Co., May 31st.
43,107 Car coupler, Empire Car Coupler Co., May 31st.
43,108 Cash register, C. Raymond, May 31st.
43,109 Car coupler, B. F. Sheldon, May 31st.
43,111 Identification card, G. H. Ward, May 31st.
43,112 Gas and petroleum motor, Friedrick Durr & Co., May 31st.
43,113 Combination billiard and dining table, H. R. Carter, May 31st.
43,114 Mail box, Postal Improvement Co., May 31st

ELECTRIC.

43,979 Railway circuit for signalling and controlling trains, F. E. Kinsman, May 29th.
42,982 Switch for electrical circuit, E. H. Johnson, May 20th.
42,999 Electric cap lighting system, L. D. Adler, et al, May 22nd.
43,039 Switch for electrical circuit, E. H. Johnson, May 27th.
43,048 Electric railway motor, H. C. Bassett, May 27th.
43,054 Telephoning, J. W. Gibboney, May 27th.
43,055 Electric telephone, E. M. Harrison, May 27th.
43,058 Electro magnetic apparatus for separating magnetic from non-magnetic particles, A. R. Moffatt, May 29th.
43,072 Incandescent electric lamp, F. A. Smith, May 30th.
43,073 Electrically operated elevators, F. E. Heidman, May 30th.
43,110 Covering electric wires, J. E. Willcutt, et al, May 31st.

SCIENTIFIC PROCESS.

42,954 Compound against rheumatism and other ailments, J. Tuck, May 18th.
43,001 Treating and purifying coal and other oils, F. F. Turney.
43,011 Purifying and maturing liquors, J. B. Cushing, May 23rd.
43,019 Cure for inflammatory rheumatism, A. Theroux and Revd. J. Foisier, May 25th.
43,068 Mnfg manganese and alloys free from carbon, W. H. Greene and W. K. Watt, May 30th.
43,071 Treatment of nickel and copper ores and matte, S. H. Emmens, May 30th.
43,105 Treating refractory ores, J. Leede, et al, May 31st.

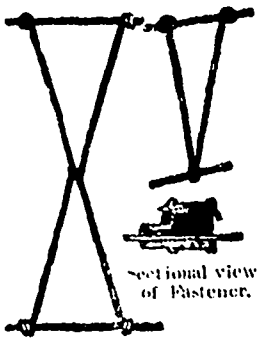
THE June issue of the Southern States Magazine embraces several articles of more than ordinary interest. The article on Jefferson Davis, by James R. Randall, author of "My Maryland," is of current interest, and the illustrated article on the Woman's College of Baltimore, is a striking feature. Published by the Manufacturers' Record Publishing Co., Baltimore, Md.

THE June number of Wide Awake is a brilliant and beautiful summer number. It opens with a delightful Shakespearean pastoral, "Will O' Stratford," by Anna Robeson Brown, illustrated by Cox. Kate Rohrer Cain's illustrated poem, "The Men in Lincoln Green," is almost a pendant to this English idyl. Lucia Chase Bell has a story of the Coeur d'Alene country in Northern Idaho, which she calls "A Little Evangeline of To-day"; Edward Porritt, an English journalist, writes of his "First Editorial"; Elton Craig has a marvel-story, "The Wizard's Palace"; Louise Collin Jones gives a timely sketch of her experience as a "Schoolma'am in Hawaii"; Capt. Julius A. Palmer gives valuable "Hints for Yachtsmen"; Oscar Fay Adams contributes a paper on Worcester. Price, 20 cents a number, $2.40 a year. D. Lothrop Company, publishers, Boston.

INTERLOCKED RAILROAD AND FARM FENCE.

THE illustrations herewith presented are of the "Eclipse" interlocked railroad and farm fence, manufactured by Messrs. R. L. F. Strathy & Co., Montreal.

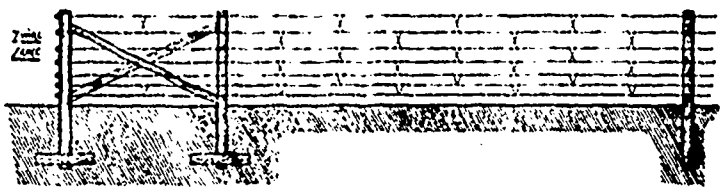
Enlarged view of Wire Guard



Sectional view of Fastener.

This device is worthy of much attention in that the manufacturers of it claim that it will supersede and take the place of the barb wire fence, which, because of its dangerousness, is so objectionable.

The Eclipse fence is made with No. 8 or No. 9 galvanized steel wire, and the wires are locked together as shown in the illustration, at distances of from four to eight feet apart, as may be desired. This is done with the Eclipse wire guard, the guard being quickly and easily attached to the wires by the use of a most convenient tool made especially for the purpose by Messrs. Strathy. With this tool the ends of the guard are wound around the wire, thus rendering it impossible for the wires to spread or to become disengaged from the guards. The guards are made of soft galvanized wire. The straining posts may be placed as far apart as 700 feet; and they should be planted very firmly in the ground. The wires having been strung, they are tightened by the use of Eclipse



The "Eclipse" Interlocked Railroad and Farm Fence.

stretchers, an inexpensive device, one of which should be allowed to remain on each wire so as to quickly take up any slack that may occur. The wires are stretched very tight so that they will abide in the position desired for them. The wires are attached to the intermediate posts by staples, which are not driven in very tight, but which allow of some play to the wires, thus providing for their expansion and contraction caused by heat and cold. This gives great elasticity to the fence. Posts may be planted at distances of 24 feet apart, or even more, and should be set in the ground very firmly.

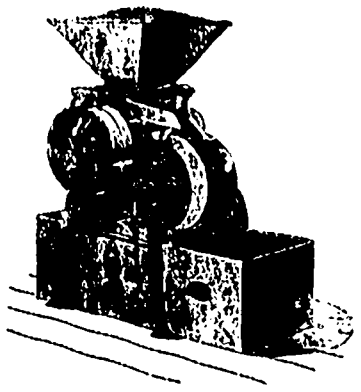
This fence is well adapted for barriers against live stock, and seems to be an ideal for farm and railroad purposes. The cost of it is not greater than that of a well-built barb-wire fence, over which it is claimed to possess many advantages, including strength, durability, harmlessness and beauty of appearance.

Messrs. Strathy will take pleasure in giving further information on application.

IN Paris they first utilize rats to clear the flesh from the bones of carcasses, then kill the rats, use the fur for trimming, their skins for gloves, and their thigh-bones for toothpicks.

MAGNETIC METAL SEPARATOR.

The accompanying illustration represents the Fitt's patent magnetic metal separator, a simple machine, recently invented, which, has been found very useful for separating iron turnings, filings, etc. from brass, composition and other materials. The wheel, represented in the cut, over which the mixed metals are falling, contains 360 magnets to which the iron adheres. The iron is carried to the brush cylinder at the back of the machine, and there removed, while the brass and other materials fall into the box on the front side. Its capacity and utility for this kind of work are said to surpass anything heretofore offered, doing its work most thoroughly and with the least amount of labor and trouble.



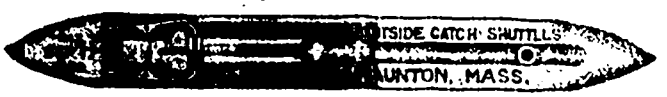
The machine pays for itself in a short time in the saving of labor effected by it, to say nothing of the improved quality of stock thus treated. Brass stock cleansed with the machine can be used for the best kinds of work. A No. 1 machine is large enough for an ordinary shop, while No. 2 machine has a little more than twice the capacity. The machine may also be used for separating iron from emery, granular rubber, ores, etc., and is capable of making a great saving of iron from ground slag and rattler sand.

In operating this machine the driving shaft should make from 90 to 100 revolutions per minute; the pulley should be 12 inches diameter and width of face 2 inches; and a 1¼ inch belt will be sufficient to transmit the power.

For further particulars, prices, etc., write the manufacturer, Ezra Sawyer, Worcester, Mass.

DUDLEY'S DOUBLE CATCH SHUTTLE.

The accompanying illustration is of a newly patented double catch shuttle manufactured by S. A Dudley, Taunton, Mass.



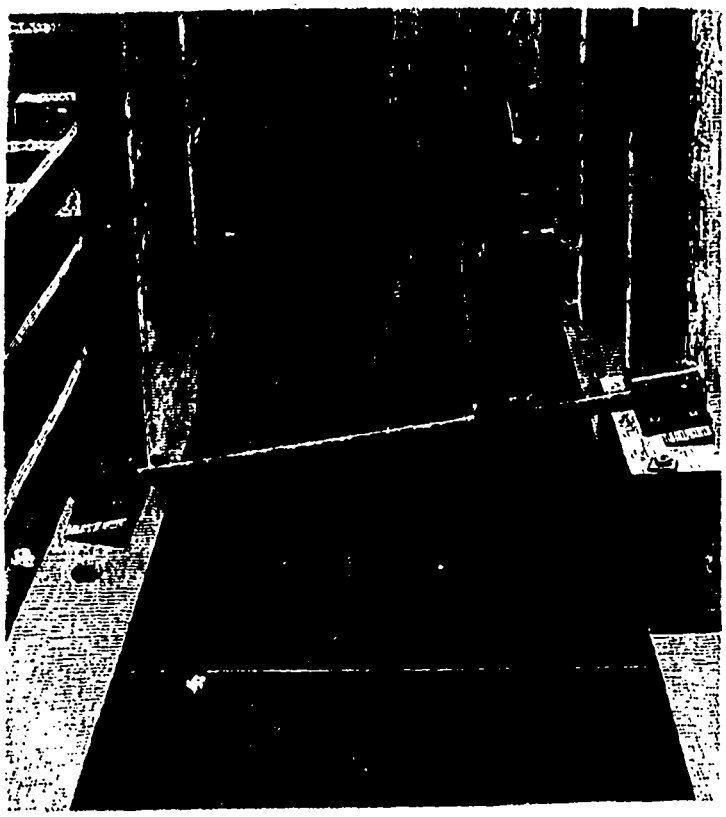
Some of the advantages claimed for this article has over other shuttles are:—It is impossible for the bobbin to knock off or lift up while the shuttle is in motion It keeps the bobbin pointing directly to the eye of the shuttle. It prevents the splitting of rim off the bobbins. It is adjustable to different sizes of bobbin heads in the same shuttle. It never needs repairing.

This double catch shuttle is a new device which has just been put on the market, and which has already been adopted by some of the largest mills in the New England States, affording the utmost satisfaction.

The town of Sorel, Que., has granted a bonus of $50,000 towards the establishment of a cotton factory there; and Mr. Hobbs, the chief promoter, is forming a strong company. The erection of the mill building will begin immediately.

ROPE TRANSMISSION OF POWER.

THE accompanying illustration shows the driven end of one of the three 500 h. p. Dodge system of rope drives supplied to the E. B. Eddy Co., of Hull, Que., by the Dodge Wood Split Pulley Co., of Toronto. The drives were started some eleven months ago, and have been run continually day and night ever since, transmitting the power from the water wheels below, in a most positive, steady, and noiseless manner, much to the satisfaction of the company's superintendent. These three drives here referred to are used for driving pulp grinders. The driving pulleys are 96 inches in diameter running at 139 revolutions per minute with twenty-four wraps of 1¼ inch in diameter Firmus rope, and driven pulleys 64 inches in diameter. The pulleys and idlers are all of cast iron and from what is known the ropes are likely to last for years. The drives present a novel and attractive appearance, and to any one interested in large transmissions, a visit to the Eddy Co's mills would certainly be interesting. The Eddy Company have also put in a 200 h. p. rope drive operated from a new Wheelock engine recently placed in their sulphite mill; also a 300 h. p. rope drive extending from the saw mill to the sulphite mill, both of which have now been running some months and are giving excellent service. This company also utilize the Dodge system of rope transmission to convey power from their planing mill to their new stone store house, a distance of over 200 feet. This drive runs the elevators. The power used in their blacksmith shop is by a rope drive, taking power across the water from the machine shops. Thus it will be seen that The Eddy Company are strongly in favor of rope driving, and are known to be wide-awake people, not likely to go in for anything that does not promise abundant success.



500 H. P. Drive in use at E. B. Eddy Co's Mill, Hull, Canada.

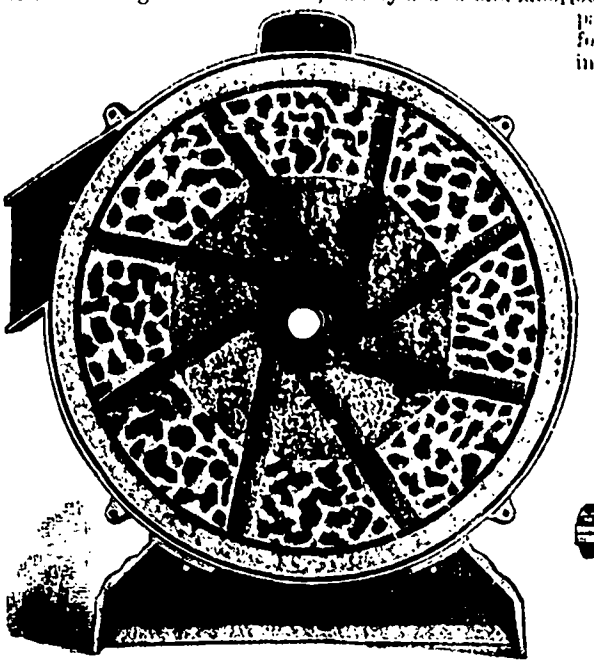
Since the installation of Eddy's drive the Dodge Wood Split Pulley Co. have put in the following drives:

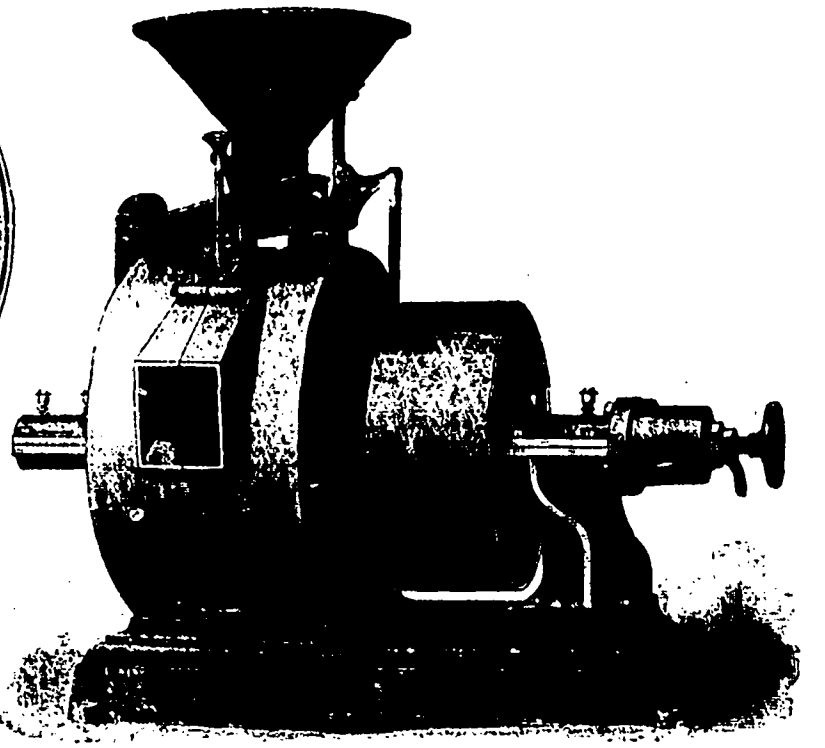
Montreal Cotton Co., Valleyfield, Que., 300 h. p.; Buell, Orr, Hurdman & Co., Hull, 100 h. p.; Ottawa Electric Light Co., Ottawa, 600 h. p.; Rathbun Co., Desoronto, 100 h. p.; R. & W. Conroy, Duchesne Mills, Que., 240 h. p.; W. C. Edwards & Co., Ottawa, 200 h. p.; R. Thackray, 50 h. p.; C. B. Wright & Sons, Hull, Que., 30 h.p.; Estate of late Jas. MacLaren, Buckingham, Que., 600 h. p.; Gilmour & Hughson, Hull, Que., 1,000 h. p.; also sundry other large drives at different places.

The Dodge Wood Split Pulley Company, of Toronto, control all the Dodge Canadian patents, and by contract for the complete equipment of power transmission of any capacity. They employ competent men, and are always pleased to give information and estimates. They also make wood split belt pulleys for all purposes from 3 inches to 20 feet in diameter. These pulleys are in use in many of the prominent mills and factories in the Dominion.

THE USE OF ROCK EMERY FOR GRINDING.

THE process of grinding by the use of millstones is one of the oldest mechanical arts known to man. From the biblical days, when women ground at the mill, and by a slow and laborious hand method prepared the meal needed for daily food, down to the latter part of the nineteenth century, millstones ground and pulverized all articles of food, or of commercial use. The only changes that have been made have been in the addition of mechanical power as a substitute for hand labor; and, in





flouring mills only, rolls have, to some extent, been substituted for the upper and the nether millstones.

It is only within a comparatively recent period that any decided advance has been made in the art of grinding by the use of stones. This improvement consists in substituting for the stones in ordinary use, grinders made from rock emery.

Rock emery is peculiarly adapted to this purpose. In hardness it is only excelled by the diamond, and its cutting power is unequalled. An emery face is always sharp, it never glazes or polishes, and cuts, with unexampled rapidity, every substance known.

Rock emery is not a common mineral, being found in but few countries. The best comes from Greece, but the larger importations are from Turkey. It is largely used in the arts.

Millstones made of rock emery are now an accomplished fact, and a long step has thus been taken towards a cheaper pulverization of hard substances that heretofore have only been reduced at much expense of wear and tear, and by slow and tedious processes. They can reduce all materials to any degree of fineness; and, as may be imagined, are rapidly coming into general use. Their merits are recognized wherever tested.

The ability of rock emery stones to run cool is a remarkably valuable feature developed, and they are as much more durable than any other millstones, as they surpass them in hardness. The face of a rock emery millstone never needs a dressing, as a little work on the furrows and eye (made of softer material), is all the sharpening they require. They are sold to country millers and farmers for the reason that they require no skilled sharpening. They are made to take the place of all other millstones, *without any changes in the mills.* Wherever other stones are used the rock emery millstone will do better work at less expense, and last much longer. They grind hard materials that would destroy other stones.

Rock emery millstones are sold at moderate price, and are far cheaper in the long run than other grinders. These stones are ample proof, if any is needed, of the progress of modern milling methods.

The accompanying illustrations show a remarkably simple mill, containing rock emery millstones, that is being used successfully by some of the larger manufacturers in Canada, such as the Rathbun Co., Deseronto; Thomas Morgan & Co., Montreal; Henderson & Potts, Halifax, and Canada Paint Co., Montreal.

These mills are also running successfully in many places in New England and on the continent, and are shipped to nearly every part of the world where grinding is done. They are manufactured by the Sturtevant Mill Company, 88 Mason Building, Boston, Mass.

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.

THERE is being erected at Lily Lake, Nova Scotia, a drying house heated with wooden furnaces, for the purpose of drying the water out of fossil fluor spar, a large deposit of which is found at the lake. The spar is a white powder, chemically is nearly pure silica, and is supposed to have an animal origin—the remains of animalculæ. The spar is valuable in the arts. It is an absorbent of water and other substances and a non-conductor of heat. It is used in the manufacture of explosives, in surgery in place of asbestos, in place of whiting in rubber shoes and many other purposes. Should the attempt prove successful, large quantities of the mineral will be shipped to the United States.

MESSRS. BURROW, STEWART & MILNE, stove founders, Hamilton, Ont., are building an extensive addition to their works.

IT was recently announced in these pages that the J. Harris Company, of St. John, N.B., had amalgamated with Messrs. Rhodes, Curry & Co., of Amherst, N.S., and that the Harris car works would be removed to Amherst. The new concern operate under the name of the Rhodes Curry Manufacturing Company, and have erected extensive works from which they are now turning out quite a number of railway cars of different descriptions.

THE Dewey Nail Company, of Palmer, Mass., are establishing a branch of their nail works at Port Hope, Ont.

THE Wm. Sclater Company have been incorporated at Montreal with a capital of $50,000 to manufacture asbestos goods.

THE Central Bridge and Engineering Company, Peterborough, Ont., have been awarded the contract to build the new union railway station in Toronto. This includes the entire structure—foundations, masonry, walls, roof, painting, glazing, etc. This is a heavy contract, and the construction of these parts of the building in which steel and iron will be used will require a largely increased working force at the Peterborough works. The engineer and superintendent of this company, Mr. W. H. Law, is a man of large experience in that line, and his name is a sufficient guarantee that the work will be done in the latest approved and most satisfactory style.

THE Auburn Woolen Company, Peterborough, Ont., are making an important enlargement of their mills including a three story stone building 50 x 44 feet. Other enlargements are in contemplation.

SOME twenty car loads of machinery have been received for the new Macdonald rolling mill which is to be erected within the western limits of Toronto. The machinery was contained in a rolling mill at Norwich, Conn.

MESSRS. DAWSON BROTHERS purpose building a large flour mill at Havelock, Ont.

THE St. Charles Omnibus Company, Belleville, Ont., are turning out an average of five electric cars per week, and have orders that will keep them busy all through the year.

THE Robb Engineering Co., Amherst, N.S., have recently received orders for a 125 horse-power Monarch Economic boiler for the I. C. R. shops at Moncton, N.B.; a 125 horse-power Robb-Armstrong Automatic engine for an electric station at Lethbridge, N.W.T.; and a 150 horse-power Monarch economic boiler for a woolen factory at Preston, Ont.

THE corporate name of the Cowan Cocoa and Chocolate Company, of Toronto, has been changed to The Cowan Company.

THE Cataract Loan Company, of Niagara Falls, Ont., is being incorporated with a capital stock of $50,000 to purchase lands, erect buildings, bridges, etc. Mr. W. L. Dorran, of the Dominion Suspender Company, in Niagara Falls, is one of the incorporators.

THE Wilkinson Truss Manufacturing Company, of Galt, Ont., is being incorporated with a capital stock of $50,000 to manufacture the Wilkinson truss, for which a patent has been acquired, also surgical and dental instruments, etc.

THE Robb Engineering Company, Amherst, N.S., are introducing in Canada the Fuller-Warren system of heating and ventilation for public buildings, private residences, etc. This system is extensively used and highly appreciated in the United States.

THE Dominion Dyewood and Chemical Company, Toronto, manufacturers and importers of aniline dyes, dye stuffs, chemicals, soaps, etc., inform us that they are sole agents for Canada for Mucklow's liquid Haematine for wool dyeing. It is claimed for this article that it is the only perfect substitute for logwood chips in the market. The advantages in using it are :—Saving of steam and labor; uniformity and cheapness; and being perfectly free from tannin matter, the wood is left in a soft and natural condition after dyeing, and the bloom of the chip logwood is not destroyed, as is the case with common logwood extracts.

THE Dominion Cotton Mills Company have no mills at Valleyfield, Que. The Mather patent bleaching plant recently placed by them was in a mill at another place.

THE Canadian Machinery Agency, Montreal, has recently supplied the Balmoral and Queen Hotels of that city with Robb-Armstrong automatic high speed engines for running electric light plants, manufactured by the Robb Engineering Co., Amherst N.S.

MESSRS MUNROE & CASSIDY announce to the trade that they have purchased the well-known and long-established book binding business of James Murray & Co., 28 Front Street West, Toronto, and will continue the same, retaining the old staff of employees. As the plant and machinery are of the latest and most approved kinds, they are confident that they can successfully compete with any concern in the trade. Both Mr. Munroe and Mr Cassidy were in the service of Messrs Murray & Co. for a number of years, Mr. Cassady as foreman; and he is a book binder with a large experience and practical knowledge of the business in all its branches.

MESSRS. STRICKLAND & Co. Lakefield, Ont., have received a cablegram order from England for a 16-foot canoe. It is to be a bridal present to the Princess May, of Teck, the bride-elect of H.R.H. George, the Duke of York.

THE Merrimac Chemical Co., 15 Pearl Street, Boston, Mass., are asking the readers of this journal to notice the fact that they are manufacturing "Carbonizer, which is a substitute for acid in carbonizing wool, destroying the burrs, and leaving the wool soft, silky and white.

MESSRS. D. SHAW and W. A. McLeod are starting a tile and rasp factory at Almonte Ont. They will occupy a part of the premises of the Almonte Electric Co., and will give employment to about a dozen hands.

THE Massey-Harris Co are enlarging their works at Brantford, Ont., by the erection of a three-storey warehouse 200 x 60 feet. This concern gives employment to also at 500 hands at their Brantford works.

MESSRS. J. A. GOWDEY & SON, manufacturers of reeds and harness, Providence, R.I., desire us to inform Canadian woolen mill men that they are introducing to the trade a new style of reed which is giving the greatest satisfaction. In the place of the narrow thick wire for dints they are putting in a very wide thin dint, which gives about one third more space for the warp to the inch, yet the reed is much stronger because of the wide wire. It can thus be seen that by having this additional space the friction on the warp is reduced and it is not as liable to break.

THE family of the late John Battle, of Thorold, Ont., have erected in the cemetery of that town a magnificent and costly monument to his memory. The column is of Peterhead granite imported from Scotland, and, including the base, is 26½ feet high It is appropriately inscribed. The monument is the work of Mr. James Munro, of St. Catharines.

THAT it pays to patent a good invention in the United States admits of no question. In no other country are inventions so highly prized, and in the number of patents granted the United States leads the world. One thing, however, is necessary to the complete protection by letters patent in that country, and that is a capable and honest attorney sufficiently skilled in patent practice to secure valid and comprehensive claims. Such a one is Mr. Henry W Williams, of Boston, Mass., whose card appears in another column. Mr. Williams is a member of the bar, and stands at the head of his profession in the New England States. He has made a specialty of patent practice for about a quarter of a century.

THE OTTAWA ELECTRIC RAILWAY.

THE railway system of Ottawa, which has been operated by two companies, the Ottawa Electric Street Railway Company and the Ottawa City Passenger Railway Company, will soon be placed under one management. The title of the new company, which has received a thirty year franchise from the city, is the Ottawa Electric Railway Company. The company will use water power generated at the Chaudiere Falls, of the Ottawa River, which are located at one end of the line. The power station at this point is of stone, iron and wood, and measures 150 x 70 ft. The turbines are of the new American, inward flow, sixty-six inch type. Each wheel operates under twenty-five feet head, and develops 450 h.p. At present three are in use, and the company is about to install three additional wheels of the same style and capacity.

During the daytime the speed of the wheel is kept constant by increasing or decreasing the flow as the load on the generators varies. Two men, one of whom relieves the other every half hour, are required for this work, the attention of the man on duty being

constantly fixed on the main voltmeter, while he moves the water gates by hand as the meter shows a variation in the voltage. During the morning and evening hours, and at other times, when only a few cars are calling for current, an artificial resistance, which takes the place of a number of cars, and was devised by T. Ahearn, is introduced in the main circuit. This resistance, which is operated by a standard Westinghouse controller, is composed of ordinary galvanized telegraph wire wound around a wooden frame and immersed in a large tank of water. The generators are of the Westinghouse type and five in number. Two of these are of the multipolar type, of 400 h.p. each, and three are 100 h.p. bipolar. The switchboard is of ash, and the switchboard appliances are of the Westinghouse pattern.

The line, all of which is supplied with current from this station, consists of four miles of single track and eleven miles of double track. It is laid with fifty pound T and fifty-two pound girder rail, resting on ties of cedar and tamarac, measuring 6 x 7 ins. x 8 ft. The maximum grade is 11 per cent. for a distance of 100 yds. The overhead system consists of iron and wooden poles, supporting a No. 0 B & S trolley wire, and furnished with line appliances supplied by the Railway Equipment Company. Galvanized iron wire bonds size No. 6, are used.

The rolling stock is very handsome. Forty five motor cars altogether, consisting of thirty-five vestibule and ten open cars, are employed. No trail cars are used. The cars are finished in natural cherry polished, are supplied with spring seats upholstered in Wilton. Ahearn electric heaters and Lewis & Fowler and Meaker registers. The trucks are of the Brill No. 13 type, and are equipped with Westinghouse twenty horse power, single reduction motors and St. Thomas thirty and thirty-three inch wheels. The company has also three electric rotary snow plows, which are of course a very necessary adjunct. The cars were all manufactured by the Wylie Car Works, of Ottawa, with the exception of one which was made by the J. G. Brill Company, of Philadelphia.

The two car houses of the company measure 188 x 66 feet each, are of stone, brick and iron, and are located near the centre of the system. Dorner & Dutton transfer tables are used. The repair shops of the company are equipped with three lathes, one electric motor, one drill, blacksmith shop, etc.

The number of passengers carried during the last fiscal year was 2,360,080, the cars making on average of about ninety miles per day. The company paid last year 7 per cent. on the $367,500 stock issued, and has no bonds. The officers are: President, J. W. McRae; vice president, G. P. Brophy; contractors and managers, Ahern & Soper.

OFFICIAL REPORT OF THE TESTS OF CUT AND WIRE NAILS.

For several reasons there has been a good deal of delay in the publication of the results of the tests as to the relative holding powers of cut and wire nails, which were made in December and January at the United States Arsenal, Watertown, Mass. Regarding these tests the following synopsis of the report gives in a general way the results of the tests, from which it will be seen that cut nails in every case were found to have greater holding power than the wire nails, the percentages with reference to the different kinds and sizes of nails being also given:

CAMBRIDGE, MASS., March 30, 1893.

To Messrs. Charles L. Bailey, President of Chesapeake Nail Works, Harrisburg, Pa.; Arthur B. Clarke, President of Old Dominion Iron & Nail Works Company, Richmond, Va.; Horace P. Tobey, Treasurer of Tremont Nail Company, West Wareham, Mass.

GENTLEMEN.—At your request, I have examined, summarized and computed percentages upon the report of Major J. W. Reilly, of the United States Ordnance Department, giving in detail the tests made for ascertaining the relative holding powers of cut nails and wire nails, of equal lengths and weights, which tests were made at the United States Arsenal, at Watertown, Mass., under the supervision of Major Reilly, in accordance with an invitation of the Eastern cut nail manufacturers of the United States to the wire-nail manufacturers of the United States, dated November 4, 1892. The tests were made in November and December, 1892, and January, 1893.

I find results as follows:

The series of tests, each series comprising 10 pairs of cut nails and wire nails of one size, were in number	58
The number of nails tested was	1,160

The nails ranged in length from	1½ to 6 in
The number of series in which the cut nails showed their superior holding power was	58
The number of series in which the wire nails showed the superior holding power was	Not any
All the nails tested were driven in	Spruce wood
Additional tests were made, of the box nails only, in	Pine wood.
In spruce wood, in nine series of tests, comprising nine sizes of common nails (longest 6 inches, shortest 1½ inches), the cut nails showed an average superiority of	47.5 per cent.
In spruce wood, in six series of tests, comprising six sizes of light common nails (longest 6 inches, shortest 1½ inches), the cut nails showed an average superiority of	47.40 per cent.
In spruce wood, in 15 series of tests, comprising 15 sizes of finishing nails (longest 4 inches, shortest, 1½ inches), the cut nails showed an average superiority of	72.22 per cent.
In spruce wood, in six series of tests, comprising six sizes of box nails (longest, 4 inches, shortest 1½ inches), the cut nails showed an average superiority of	50.88 per cent.
In spruce wood, in four series of tests, comprising four sizes of floor nails (longest 4 inches, shortest 2 inches), the cut nails showed an average superiority of	80.03 per cent.
In spruce wood, in above 40 series of tests, comprising 40 sizes of nails (longest 6 inches, shortest 1½ inches), the cut nail showed an average superiority of	60.50 per cent.
In pine wood, in six series of tests, comprising six sizes of box nails (longest 4 inches, shortest 1½ inches), driven with a taper perpendicular to grain of wood, the cut nail showed an average superiority of	135.20 percent
In pine wood, in six series of tests, comprising six sizes of box nails (longest 4 inches, shortest 1½ inches), driven with taper parallel to grain of wood, the cut nail showed average superiority of	100.23 percent.
In pine wood, in six series of tests, comprising six sizes of box nails (longest 4 inches, shortest 1½ inches), driven in end of wood, the cut nail showed an average superiority of	64.38 per cent.
In pine wood in above named 18 series of tests, comprising six sizes of box nails (longest 4 inches, shortest 1½ inches), driven in three ways, the cut nail showed an average superiority of	99.93 per cent.
In spruce and pine wood combined, in the whole 58 series of tests, comprising 40 sizes of nails, (longest 6 inches, shortest 1½ inches), the cut nails showed average superiority of	72.74 per cent.

Yours respectfully,
WM. H. BURR, Consulting Engineer.

Referring to the above report, the committee in charge of the tests address the manufacturers of cut and wire nails in the United States as follows:

GENTLEMEN.—We have the honor of presenting hereunder the results of the challenge tests, computed and arranged by Consulting Engineer Wm. H. Burr, from the detailed official report of Commanding officer, J. W. Reilly, Major Ordnance Department U.S.A., in command of the United States Arsenal at Watertown, Mass., and of the United States testing machine at that station.

The report of Major Reilly gives the action, under stress, of each one of the nails (1,160 in number) tested in the trials, but it is embodied in fifty-two manuscript pages; and in accordance with the custom of the testing department, it does not give the groupings, general summaries and percentages which are necessary for concise presentation and quick comprehension of the results. In order to obtain these we handed Major Reilly's report to Mr. Burr, who is doubtless known to most of the nail manufacturers through his professional reputation and published works, and also as the occupant of a prominent professorship of engineering.

We preserve the report of Major Reilly for any examination or comparison that may be called for. The said report is made from the original entries, preserved in the record books of the testing department of the United States Arsenal at Watertown, Mass.

Yours respectfully,
CHARLES L. BAILEY,
ARTHUR B. CLARKE,
HORACE P. TOBEY.
} Committee.

BANK OF ENGLAND NOTES.

In a picturesque Hampshire nook in the valley of the River Test stands a busy mill, from which is produced that paper whose crispness is music to the human ear all the world over. Since 1719 this Leverstoke mill has been busy in the manufacture of the Bank of England note paper, and at the present time about 50,000 of the coveted crisp pieces of paper are made there daily.

To a careful observer there does not appear to be much difference *between a Bank of England note* of the present day and one of those which were first issued toward the end of the seventeenth century, but when looked into it will be found that the present note is, as regards the quality of the paper and the excellence of the engraved writing, a much more remarkable production.

The fact is the Bank of England and forgers of false notes have been running a race—the bank to turn out a note which defies the power of the forger to imitate it, and those nimble-fingered and keen-witted gentry to "keep even" with the bank.

The notes now in use are most elaborately manufactured "bits of paper." The paper itself is remarkable in many ways; none other has that peculiar "feel" of crispness and toughness, while the eye (when it has satisfied itself with the "amount") may dwell with admiration on the paper's remarkable whiteness. Its thinness and transparency are guards against two once popular modes of forgery—the washing out of printing by means of turpentine and erasure with the knife.

The wire mark, or water mark, is another precaution against *counterfeiting, and is produced in the paper while it is in a state of* pulp. In the old manufacture of bank notes this water mark was caused by an immense number of wires (over 2,000) stitched and sewn together; now it is engraved in a steel-faced die, which is afterward hardened, and is then used as a punch to stamp the pattern out of plates of sheet brass. The shading of the letters of this water mark enormously increases the difficulty of imitation.

The paper is made entirely from pieces of new linen and cotton, and the toughness of it can be roughly guessed from the fact that a single bank note will, when unsized, support a weight of thirty-six pounds, while when sized you may lift fifty-six pounds with it.

Few people would imagine that a Bank of England note was not of the same thickness all through. It is not, though. The paper is thicker in the left hand corner, to enable it to take better and sharper impressions of the vignette there, and it is also considerably thicker in the dark shadows of the centre letters and under the figures at the ends. Counterfeit notes are invariably of only one thickness throughout.

The printing is done from electrotypes, the figure of Britannia being the design of Maclise, the late royal academician.

Even the printing ink is of special make, and is manufactured at the bank. Comparing a genuine with a forged note one observes that the print on the latter is generally bluish or brown. On the real note it is a velvety black. The chief ingredients used in making the ink are linseed oil and the charred husks and some other portions of Rhenish grapes.

The notes are printed at the rate of 3,000 an hour at Napier's steam press, and the bank issues 9,000,000,000 of them a year, representing about £300,000,000 in hard cash.

RUST-PREVENTING RECIPES.

To remove rust from nickle plate: Grease the rust stains with oil, and after a few days rub thoroughly *with a cloth moistened* with ammonia. If any spots still remain, remove them with dilute hydrochloric acid and polish with tripoli.

To remove rust from finely-polished steel: Rust may be removed from finely-polished steel without injury to the surface by cleaning the article with a mixture of ten parts of tin putty, eight of prepared buckshorn, and twenty-five of alcohol, and then rubbing with blotting paper.

To keep machinery from rusting. In order to keep machinery from rusting, take one ounce of camphor, dissolve it in one pound of melted lard; take off the scum, and mix as much fine black lead as will give it iron color. Clean the machinery and smear it with the mixture. After twenty-four hours rub clean with soft linen cloth. It will keep clean for months under ordinary circumstances.

To remove rust: To remove rust from iron or steel utensils the following solution is applied by the means of a brush, after having removed any grease by rubbing with a clean, dry cloth: 100 grammes stannic chloride are dissolved in one litre of water; this solution is next added *to one containing twenty-five grammes* tartaric acid dissolved in the litre of water, and, finally, twenty cubic centimeters indigo solution diluted with two litres of water are

added. After allowing the solution to act for a few seconds, it is rubbed clean with first a moist cloth, later with a dry cloth; to restore the polish. Use is made of silver and jewelers' rouge.

To keep iron pipe from rusting: A simple and economical way of tarring sheet-iron pipes, to keep them from rusting, is as follows: The sections as made should be coated with a coal tar and then filled with light-wood shavings, and the latter set on fire. It is declared that the effect of this treatment will be to make the iron practically proof against rust for an indefinite period, rendering future painting unnecessary.

TRANSMISSION OF POWER IN FACTORIES

The growth of electricity in its application to the transmission of power in mills, factories, and machine shops has been very rapid. In places were little power is required, if a current can be had from a central station, it is generally used not so much from a point of economy when a steady load is required, as its convenience and neatness. Its superiority over all other forms of transmission when the energy is required to be transmitted a considerable distance is conceded by all; but that it can be used economically in mills and factories in the transmission of power to the various parts of the factory has not until recently been demonstrated.

The Scientific American of April 1st contains a very interesting description of the power plant installed in the new small arms factory at Herstal, Belgium. The work was undertaken under the direction of the Societe Internationale d'Electricite for the purpose of comparing this with other modes of transmission. When work was undertaken by the society the engine had already been ordered of 500-horse power, running at 66 revolutions per minute, and for this reason a special dynamo had to be constructed. The fly wheel was done away with and in the plan of dynamo adopted the armature acted as a fly wheel. This armature was supplied with two commutators allowing the generator to be run in either full or at half load. In order to compare the efficiency of electrical transmission with other kinds, the most eminent firms were asked for details, as to the power necessary at the engine to deliver a given power to the machines using mechanical transmission, but no satisfactory replies were received. In the factory there was required power to turn 9 shafts requiring 12-horse power each, two shafts requiring 10-horse power each, and two shafts requiring 30-horse power each. The motors that were put in, in order to be fully up to the requirements, were of the following horse power: nine motors of 16-horse power, two motors of 21 horse power, two motors of 37-horse power. The motors were guaranteed to have an efficiency of from 87 to 89 per cent., and the generator an efficiency of 90 per cent. The efficiency of the engine was guaranteed to be 92 per cent. so that the power delivered by the motors was 72 1-2 per cent. of the indicated horse power of the engine.

Owing to the absence of all belt transmission, the power necessary to drive the engine idle is but 28-horse power while with another form of transmission it would not be less than 40-horse power. Many of the motors are subjected to a variable load and also are exposed to dust and dirt. By belt driving the power lost in transmission is a constant quantity for all loads. It shows that taking 79.4 per cent. as a final output in the two cases one of the electrical and the other of the mechanical transmission we find that at a load of 20 per cent., the electrical system will still give a load of 47.2 per cent. useful effect and the mechanical none at all. From careful experiments, which had been made in actual practice, it has been clearly proven that to drive all the machines idle needs more power than to drive the shops in the ordinary course of work; whereas 11 electrical horse power is required in driving all the tools idle only about seven electrical horse power is used to drive the shafts, belts, etc., alone. This clearly shows how small a part of the power produced by the engine is actually used in useful work at the tools. Such satisfactory results of the application of electricity to factory driving must attract attention and will doubtless lead to great changes in transmission. Whether it is advisable to supply each machine with a separate motor is a question which must be considered in each case. The current can be switched on or off as easily as a belt may be thrown from the loose to the fast pulley.—Electrical Industries.

THE Central Bridge and Engineering Co., Peterborough, Ont., are constructing two flexible steel joints to be used in repairing the intake pipe of the Toronto Water works system. The valves are six feet in diameter.

MACHINERY.

FOLLOWING list of New and Second-Hand Boilers, Engines and General Machinery for sale by The Canada Machinery and Supply Co., Brantford, Ont., dealers in New and Second-Hand Machinery and Supplies:—

ONE BOILER, TO BRICK IN, 11 in. dia. x 11 ft. 7 in. long, 11 3-in. tubes, in first-class order.

THREE 25 H.P. PORTABLE loco. fire-box boilers, in good order.

TWO 7-H.P. FIRE BOX BOILERS for cheese factories

ONE 12 x 16 SLIDE-VALVE ENGINE, Beckett's make.

ONE 10½ x 15 HORIZONTAL ENGINE, Whitelaw make, in last class order.

TWO 9 x 12 HORIZONTAL ENGINES, Waterous make, "Clipper."

ONE 9 x 12 HORIZONTAL ENGINE Morrison maker, Hamilton.

TWO 5½ x 9 SLIDE-VALVE ENGINES, Beckett's make.

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ONE 12-H.P. TRACTION PORTABLE ENGINE and boiler, Oshawa make.

ONE "THOMPSON" ENGINE INDICATOR, in walnut case.

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ONE 24 INCH, GOLDIE, & McCULLOCH make, Planer and Matcher, with Shimer heads.

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ONE HEAVY IRON FRAME SHAPER, Cowan & Co. makers.

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ONE BLIND SLAT TENONING MACHINE.

SIX GOOD SAW TABLES.

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ONE SET TWO HEAD BLOCK SAW MILL irons

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ONE LOZENGE MAKING MACHINE, of large capacity, American make, complete with brass dies and printing attachment.

ONE 36 INCH SCLATER WATER WHEEL.

THREE 30 INCH "LEFFELL" WATER WHEELS.

ONE 17½ INCH "LEFFELL" WATER WHEEL.

ONE 16 INCH "LITTLE GIANT" WATER WHEEL.

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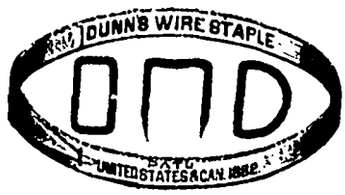

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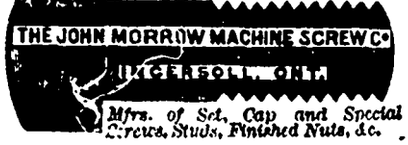

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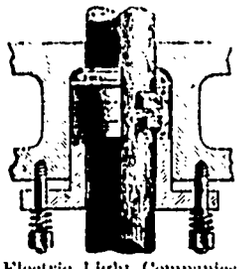

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THE OBJECTS OF THIS ASSOCIATION ARE:

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.

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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 $91,004.20 And in addition thereto bonus dividends have been declared to continuing members amounting to $21,522.72.

Besides achieving such result, we now also have, over all liabilities—including a re-insurance reserve (based on the Government standard of 50 per cent), a cash surplus of 1.33 per cent. to the amount of risk in force.

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.

JAMES GOLDIE, Pres. W. H. HOWLAND, Vice-Pres. T. WALMSLEY, Treas. HUGH SCOTT, Man. Dir.

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ESTABLISHED 1882

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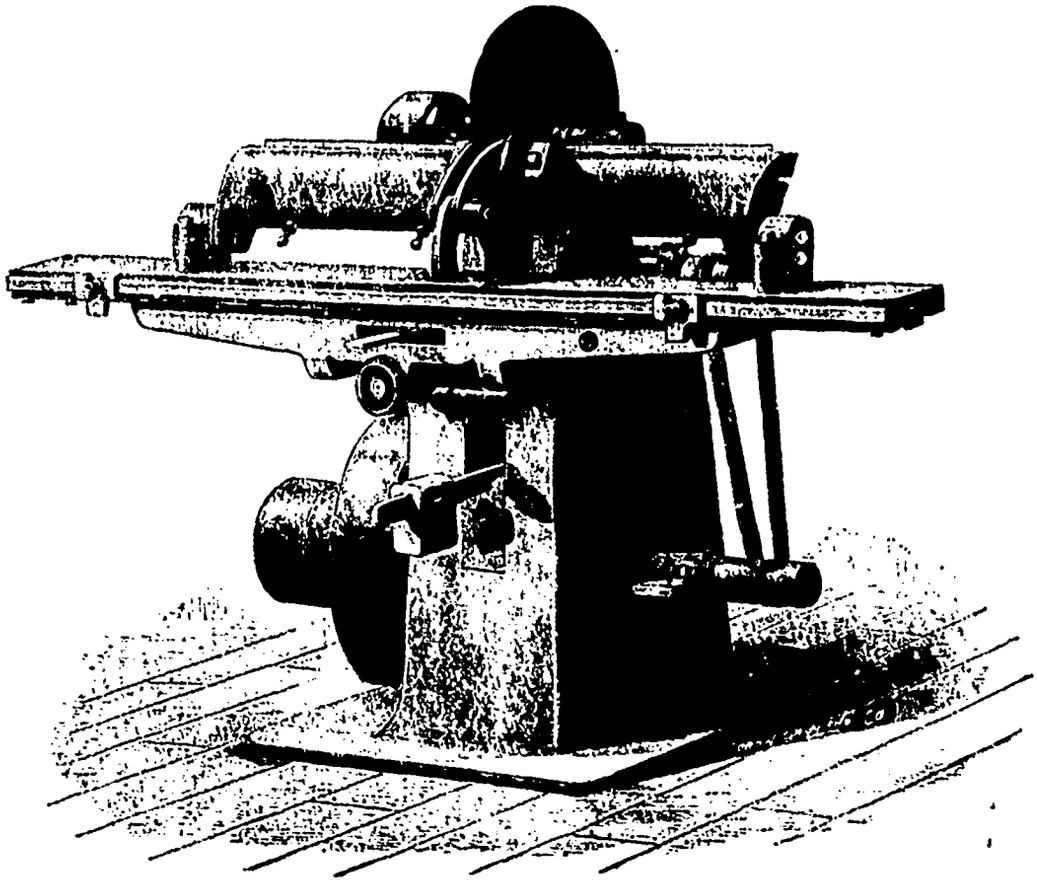

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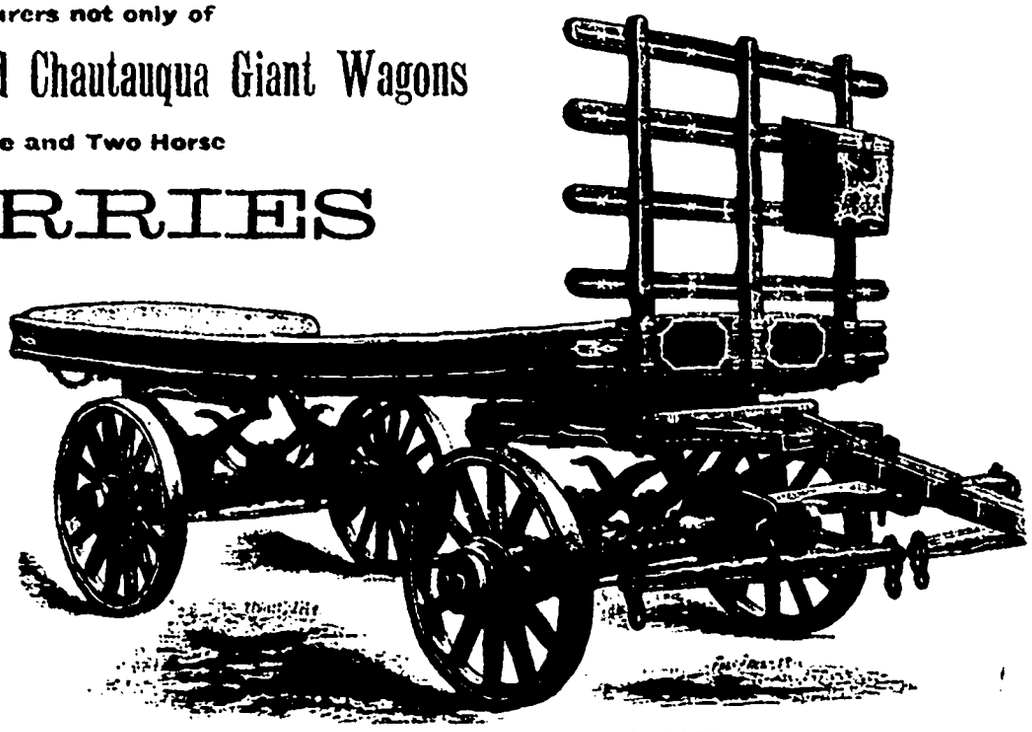

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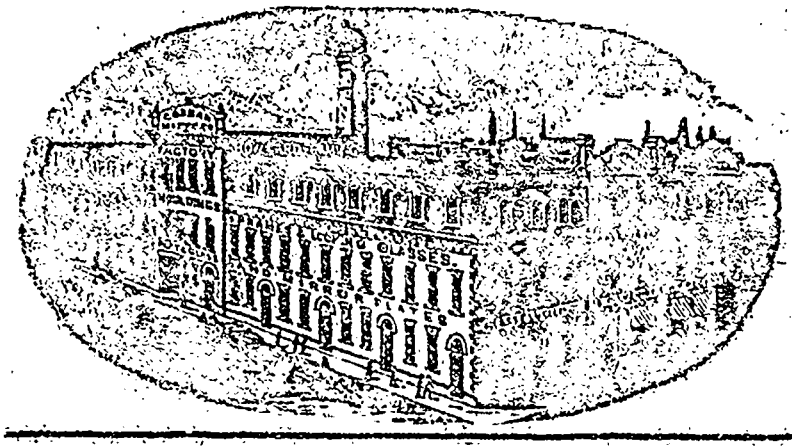

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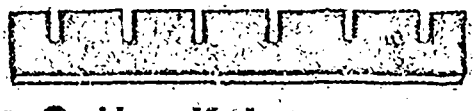

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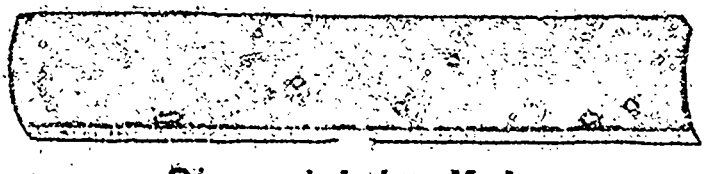

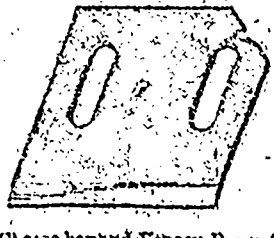

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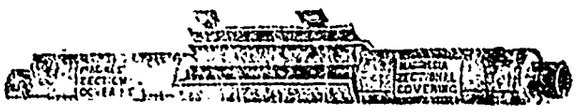

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