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**CANADIAN MANUFACTURER**  
AND INDUSTRIAL WORLD  
DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

Vol. 26

TORONTO, JANUARY 19, 1894.

No. 2.

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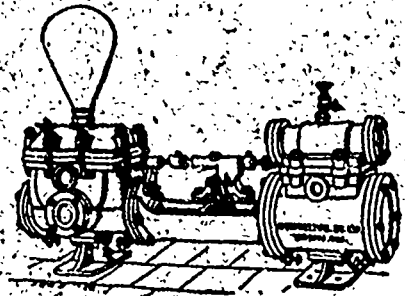
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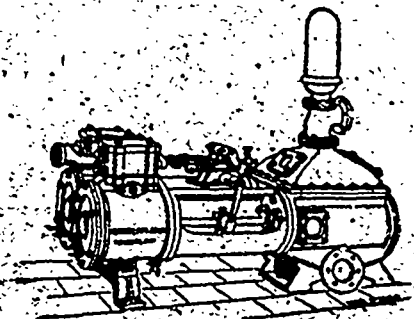
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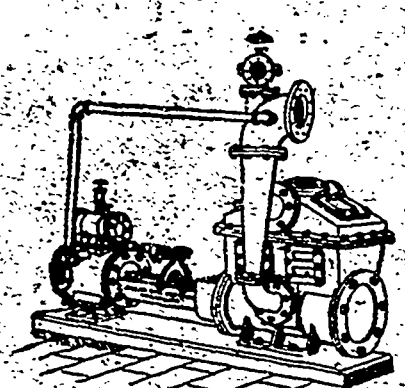


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**THE ROLLING MILL INDUSTRY.**

As the time draws near for the meeting of the Dominion Parliament, when without doubt some important changes will be made in the iron schedule of the tariff, the rolling mill men are showing considerable uneasiness, believing that one of the changes will be to increase the duty on scrap iron. Those engaged in this industry are keen business men who have profited to the fullest extent by an anomaly of the tariff which has unduly enriched them, and at the same time has been one of the great causes of the non-development of the blast furnace industry to a much greater degree than that which now characterizes it. It was a noble and patriotic desire on the part of Sir Charles Tupper when he was Finance Minister to foster and develop a comprehensive iron industry in Canada; and while his plan was a good one in many of its features, there were other features of it that have marred and blighted the symmetry of the whole, absolutely preventing any material advance along the lines that he so fondly hoped would in a brief time make Canada distinguished as an iron

producing nation. He made the mistake of supposing that the low duty of \$4 per ton on pig iron would be sufficient to develop our blast furnace industry, subsequent events proving that that duty was too low; but instead of increasing it as should have been done, a not over satisfactory amendment was made by which a bounty of \$2 per ton was bestowed upon the production of iron in Canada from Canadian ore. It was a mistake not to have made the duty \$6 per ton in the first place; and if this had been done, there would not have been the subsequent necessity of granting the bonus. No good objection can be advanced against the duty of \$9 per ton upon slabs, blooms, puddled bars and other forms less finished than bars, and more advanced than pig iron; or against the duty of \$13 per ton upon finished bar iron; but it was a disastrous blunder to impose a duty of only \$2 per ton upon wrought scrap iron. When it is remembered that pig iron is the first and lowest form of iron; that before finished iron can be made the pig iron must undergo the process of puddling, and that wrought scrap iron is iron that has been puddled, and only needs heating and rolling to make it into desired forms of refined iron; it will be seen that by the use of scrap for the manufacture of bar iron, instead of slabs or blooms or puddled bars, by which a great saving is made to the rolling mills, there would be no inducement for the rolling mills to operate puddling furnaces; and that if a big demand did not exist for pig iron for puddling purposes the demand for such iron would be restricted to that extent. No one attaches blame to the rolling mill men for taking full advantage of the circumstances thrust upon them by Sir Charles Tupper's blunder, although that blunder has been so disastrous to the furnace men and to the country generally; but it is the undoubted duty of the Government to correct the mistake.

The discussion of this phase of the tariff has been going on for a long time; and this journal was the first to agitate for the much needed reform. It has always argued that it was never the spirit or intention of the National Policy to make it possible that any industry should reap any extravagant advantage because of any provision of the tariff. It is not an enemy of the rolling mills, but a consistent friend to the manufacturing industries of Canada generally; and it is our opinion that with this anomaly of the tariff corrected, and the duty upon scrap iron increased to at least that upon puddled bars—\$9 per ton—no further changes would be necessary in duties upon the primary forms of iron. Our reasons for this belief have been given repeatedly.

The discussion of this question has become so interesting that some of the leading men engaged in different branches of the iron industry have seen proper to express their views upon it in the public press. Mr. A. T. Paterson, of the Londonderry Iron Company, has given some excellent reasons why the duty upon scrap iron should be increased; and Mr. George E. Drummond, of the Canada Furnace Company, has discussed the matter in an address recently made before the Quebec Mining Association. On the other hand a leading Montreal rolling mill owner ventilates his side of the question and attempts to show that the existing low duty on scrap is essential to the prosperity of the country.

The gist of his argument is that since the inception of the present tariff no efforts have been made by any Canadian furnace company to supply the requirements of the rolling

mill men; that instead of endeavoring to do so, as had been promised for them by Sir Charles Tupper, they had gone into the manufacture of cast iron pipe, bar iron, etc., and this, as they alleged, because they were not able to sell any puddled bars. They sold what foundry pig they made, and the balance of their output they manufactured into the articles named, by doing which they came directly into opposition to the rolling mill men whom they should have supplied with their raw material, puddled iron.

This argument is entirely without weight. As we have frequently shown, the rolling mill men found it very much more to their advantage to manufacture a cheaper grade of bar iron from scrap, than a superior grade from puddled iron. By using scrap they avoided the expense of the puddling process—about \$5 per ton—and this was a clear gain to them; and if the furnace men could not sell puddled bars, it was because the rolling mill men would not purchase them. Scrap iron was cheaper. As Mr. Paterson shows, and as is well known, the furnaces cannot avoid turning out at least three grades of iron. The highest quality is always in good demand for foundry purposes, but the others cannot be profitably converted into puddled bars because of the low duty on scrap; and if they were not made into pipe and similar forms of cast iron, they could find no sale. The Londonderry Company make some refined bar iron, where a most excellent quality must be had; but it could not sell its puddled bars at anything like cost to the rolling mill men.

This Montreal rolling mill man accuses this journal of inaccuracies in statements made regarding this question, in that we said that the market price of wrought scrap in Toronto was about \$8 to \$9 per ton, while in Montreal it was \$15 to \$16. Without exception every Toronto paper that gives market reports in that line have quoted the prices we have named; and batches of letters received from boilermakers and machinists in various parts of Ontario quote quite as low—many of them even lower prices than \$8 per ton, as being the best offers they can obtain from the only rolling mill then doing business in this Province. These letters are open for inspection in this office to any one who may desire to test the accuracy of what we have said.

It is unfortunate that the rolling mill men have come to imagine that they have a vested right in the blunder of the tariff on scrap iron. They should understand that the blunder must be corrected; and they should acquiesce in the correction that will inevitably be made. If they are friends of the Government that has been so long suffering and favorable to them, they should assist it in making such revisions of the tariff as the exigencies demand. Pouting like spoiled children, and holding themselves aloof from consultation with other manufacturers is no way to assist the Government in solving a most important problem. Their refusal to consult with the leading men in about all the other iron industries of the country does not help to maintain a ridiculous tariff duty, neither does it prevent these others from co-operating with the Government, and advising where important changes should be made. There is no desire to belittle the importance to the country of the rolling mill industry, nor to deprive it of a full and just share in the benefits of true protection. All interests must be considered in discussing the tariff question; and the rolling mill men should bear it in remembrance that the

determination of the Government to do all it can to make Canada an iron producing country cannot be thwarted by the proprietors of an industry the raw material of which is only the salvage and wreck gathered up chiefly in foreign countries, and the product of no organized industry on earth.

The duty on scrap iron must be increased.

#### LONDON AND ITS MANUFACTURERS.

It was recently remarked in these pages that the London Advertiser kept an item standing regarding the advantages of that city, reference being had to the population, location, railway facilities, etc.; and the names of a large number of manufacturing and commercial enterprises already established there were alluded to. We stated also that without these establishments London would not be much of a city, and that their presence there was due to the National Policy.

The Advertiser agrees with us in our facts, but vigorously dissents from our conclusions; and it loudly proclaims that London owes nothing to the National Policy; that it has lost much by that policy and its concomitants of gambling and land speculation. It says that this view is not its alone; that it is the view of the majority of the manufacturers of that city, and of the best class of the working community. Hear it:

What a travesty to assert that London is indebted for its existence to the policy of high taxation, of restricting the power of the people to make the most of their earnings, of filching from the customers of the manufacturers and merchants of London the immense sums of money by over taxation and by special privileges to such men as Millionaires Massey and Drummond. Rather have the interests of the city been much injured by this policy. And the majority of the people, including the manufacturers, the merchants, the artisans, the laborers, have so declared. Citizens generally, as well as the Advertiser, have nothing but good will for the manufacturers, and wish them every prosperity. For that reason, it is desirable that every unnecessary shackle to the freedom of exchange of products, every unfair advantage given by law to individuals, every opportunity for one man to unduly profit at the expense of his neighbor, shall as speedily as possible be removed. With free raw materials and an extended market, the London manufacturers can hold their own.

We do not imagine that the Advertiser knows more of what is necessary to ensure the success of the manufacturing industries of London than the manufacturers themselves do. In fact, judging from the ranting and wild manner in which our contemporary delivers itself, it may be stated with confidence that it knows very little of the matter. There are quite a large number of manufacturers in London in whose judgment we would rather trust in deciding as to the benefit that city and the country generally derives from the National Policy, and the benefit it bestows upon our manufacturing industries, than in the judgment of the Advertiser. It seems to be somewhat rough, too, upon the London manufacturers for the Advertiser to tell them that under the shield of the National Policy they filch from their customers immense sums of money by over-taxation and special privileges. Will the Advertiser kindly suggest the names of some of the London manufacturers to whom its insinuations apply? And do these insinuations really represent the honest opinion of the Advertiser regarding London manufacturers? It mentions the names of Millionaires Massey and Drummond, and this evidently because

neither of these gentlemen do business in London; but its insinuation is none the less directed towards the manufacturers who do do business in that city. It is a cowardly subterfuge to mention the names of non-residents as representing a class of most estimable citizens. The Advertiser says that the National Policy restricts the power of the people of London to make the most of their earnings by making it possible for the London manufacturers, because of the special privileges granted them by that policy, to filch from and rob their customers of immense sums of money, and that the interests of that city have been much injured because of this. Of course, neither Mr. Massey nor Mr. Drummond can be charged as being active participants in this stealing and robbing, the clear inference being that the London manufacturers are the guilty ones. Who, pray, are the ones whom the Advertiser so unmistakably points out? Included among the more prominent manufacturers of that city, who are upholders of the National Policy, who are large employers of labor, and who have contributed very largely to its prosperity, we may mention such men and concerns as D. S. Perrin & Co., Canada Chemical Company, Isaac Waterman, McCormick Mfg Co., McClary Mfg Co., C. R. Somerville. Does the Advertiser pretend to say that these men take any dishonest advantage of their customers, and enrich themselves by fraudulent practices made possible by the National Policy?

It is exceedingly kind of the Advertiser to tell these manufacturers, whom it so basely slanders, that it has nothing but good will for them, and that it wishes them every prosperity. This is adding insult to insult. It tells them that they are filchers, yet it has nothing but good will for them: it says that the interests of London have been much injured by them, but that it wishes them every prosperity. There is a delightful difference of opinion, too, between the Advertiser and the manufacturers whom it so unreasonably denounces. It tells us that London owes nothing to the National Policy. It admits very freely that without its manufacturing industries that city would not be in a prosperous condition; and yet the very manufacturers, who have made that city so prosperous, declare most positively that without the National Policy their enterprises could not be prosperous. In other words, those, to whom London owes so much, say that their prosperity and the prosperity of their city is due to the National Policy, although the Advertiser declares that it is not so. Who are the more competent to judge?

The Advertiser not only tells us that London owes nothing to the National Policy—that it has lost much by that policy and its concomitant of gambling—but it also declares that this view is that of the majority of the manufacturers of that city and of the best class of the working community. We cannot bring ourselves to believe this fable. It requires more than the say so of the Advertiser to bring sensible men to believe it. Has a personal canvass of the manufacturers of London been taken, and does it develop the fact that a majority of them are opposed to the policy of protection? If so, the names ought to be published so that this valuable free trade influence might not be wasted. We challenge the Advertiser to substantiate its assertion. It should produce the proof or admit the slander.

It is not recorded that the Ananias was guilty of more than one falsehood, and retributive justice was quick in measuring

out a dreadful punishment therefor; but what, oh, what, will be the doom of the Advertiser for the awful sins it is constantly committing against the truth when it gets into deliriums of rage over the National Policy?

### IRONWORKERS' WAGES.

Does protection ensure high wages? Pending the passage of the Wilson tariff bill in the United States Congress, much discussion is going on in that country as to whether protection is necessary to keep the wages of ironworkers and other classes of workmen up to the standard now prevailing there. It is also claimed by some of the tariff reformers that under the combinations said to exist among American iron makers, the wages of workers in that industry very closely approximate those performing similar service in Great Britain. We believe it to be a fact that the wages of ironworkers in Canada are substantially the same as in the United States, and therefore we assume that any great lowering of our tariff duties on iron would have the same effect as the triumph of the Wilson Bill would have on the American industry.

Mr. Henry Tuckly has recently published a paper, "Masses and Classes" (Cranston & Curtis, Cincinnati), in which he analyzes this question very thoroughly. In it he says:

We had read in the English papers, and had heard in conversation, so many unkind allusions to the way in which workmen had been treated by American employers at Homestead and elsewhere that we determined to find out, if we could, what wages were being paid to workmen in similar lines in England. Accordingly we went to Sheffield.

The manufacturers were quite English, which means that they were hard to get at and very reticent. In a country where the clergy are boxed up for the most part, as though while dispensing the Word of Life it were necessary to protect them securely against the people in the pews, and where almost every man who has a tidy house and grounds walls himself in against the possibility of his possessions being even looked at by vulgar outsiders, this reserve on the part of large employers of labor was naturally to be expected. By tact and perseverance, however, we did manage to converse with representatives of two firms, and we were not badly received by them. The Atlas Works and the large establishment of C. Cammell & Co. turn out steel in enormous quantity and for almost all purposes, and it is said that altogether they have something like ten thousand men in their service. How nice it would be, we thought, if these concerns would favor us with a quiet look at their pay-rolls, and we even ventured to suggest in their very presence that this, or the equivalent of it, was the object of our call. But our polite insinuations were only as sounding brass, and we had an inward conviction, while making them, that in ears so unused to such American liberties they must have sounded very brassy indeed. To show how utterly hopeless was the quest we had undertaken the secretary of the Cammell Company assured us that they had refused to give information about wages even when asked for it by statisticians of the British Government, and the gentleman representing the other firm waived the main issue by explaining that "of course wages were higher in America than in England because the restrictions against foreign competition were so much greater."

Thus ended our labors with the manufacturers, and having treated these gentlemen with proper respect we felt that we were then at liberty to seek enlightenment elsewhere. The American consulate is always accessible, and the representative of the Stars and Stripes in Sheffield, Mr. Benjamin Fol-

son, an own cousin of Mrs. Cleveland, and an old newspaper man withal, we found to be deeply interested in labor questions and quite ready to help us in the mission we had undertaken. In visible attestation of his patriotism Mr. Folsom displays the model of an American eagle over the front door of his office, and his conversation we found to be fully as patriotic as the sign he had hung out. Between the condition of the working classes in the United States and that of the same classes in England the difference, he said, was great in the extreme. In America the drift was always upward, whereas here it maintained a dead level. The rule in England was once a workman always a workman, while with us large numbers climbed up. They first got a house of their own, and you would hear of them soon after as mayors of cities. He had been visited recently by an American who began life as a blacksmith. In England the same man would have been a blacksmith to-day; but instead of this he now has one hundred and fifty men in his employ and is an inventor whose machines are known all over the world.

From reports to which our attention was directed by Mr. Folsom we made the following abstracts of the general run of wages in Sheffield. For workers in iron the hours vary from fifty to fifty-seven per week, and the average weekly earnings were given thus: Puddlers, \$7.78; underhands, \$5.24; shinglers, \$12.89; assistants, \$8.99; ball furnacemen, \$12.16; underhands, \$7.29; charcoal-lumpers, \$14.50; rollers, \$10.94; assistants, \$7.29; metal-refiners, \$10.04; plate-rollers, \$15.80; furnacemen, \$14.59; firemen, \$8.51; scale-melters, \$8.51; forgemen, \$14.59; levermen, \$6.07; bogiemmen, \$6.07; hammer-drivers, \$7.29; pattern-makers, \$7.90; molders, \$8.51; fettlers, \$6.44; laborers, \$5.10; iron-trailers, \$3.89; tire-rollers, \$13.62; machinists, \$7.78. From the same reports we learned that men engaged in making pocket and table cutlery were earning on an average from \$6.07 a week to \$9.73. For railway employes the average wage was given as follows: Engine-drivers, \$1.50, for a day of twelve hours; firemen, \$1.99. The rate of the others is by the week: Passenger-guards, \$6.80; goods-guards, \$6.32; watchmen, \$5.34; pointsmen, \$6.32; passenger-porters, \$3.89; goods-porters, \$4.86; engine fitters, \$6.80; car-examiners, \$6.32. Counter-men in dry-goods stores are reported as averaging a little less than \$200 a year; policemen average \$7.20 and street-laborers \$4.86 a week.

The figures we obtained from the same reports, bearing directly upon the steel trade, were as follows: 1. Steel-converting: foremen (45 hours), \$7.29; laborers, \$4.86. 2. Steel-melting: teemers (60 hours), \$8.75; pullers-out, \$7.05; cokers, \$4.86; pot-makers, \$8.51; cellar-lad, \$1.82. 3. Steel-rolling: foremen (48 hours), \$10.94; rollers, \$8.75. For the class of labor indicated these sums at the time the reports were made represented the average weekly earnings of all employed. But both as regarded these and the wages given in other branches the question to be determined before any reliance could be placed upon them, in a comparison with American wages, was whether they represented fairly the wages obtaining in Sheffield at the present day. Mr. Folsom and his intelligent clerk both thought they did. There might have been a slight fluctuation up or down in the period covered, but they did not believe there had been any great change one way or the other. If either way the tendency, they thought, had been upward. Still, to make sure as to this, they would advise me to confer with the leading officials of the Federated Trades Union.

The gentleman we visited was Mr. Charles Hobson, who is not only a town councilor but has served for five or six years as president of the Sheffield Labor Council, an organization in which fifty-five trades are embraced, and with a paying membership of about fifteen thousand. In replying to our inquiries Mr. Hobson thought that trades unionism had certainly accomplished something in Sheffield within recent years, both as regarded hours of employment and the rate of pay. Still, in looking over the figures above given, especially those relating to the iron and steel trade, he could not

help saying that, allowing for a slight increase in a few lines, the list could be consistently published in America, and might be properly used, with slight modifications, in any comparison which was desired with the wages of similar workmen in the United States.

So far so good; but upon the one pressing matter which we had gone to Sheffield especially to investigate this gentleman, unfortunately, was not willing to enlighten us. We had carried with us a newspaper clipping, giving a catalogue of thirty-four different occupations in which men had been engaged at Homestead, with the amount of wages which it was estimated would fall to the lot of these different workmen under the new scale offered them; and that which we wanted to find out was what the same class of men were earning per day in Sheffield at the present time. This, Mr. Hobson said, he could not tell us; and the employers having previously averred that they would not afford this information the prospect looked discouraging. But this information we obtained finally, and it is given herewith to the reader. Our kind informant—a practical and intelligent workman in the steel trade—had been allowed twenty-four hours for reflection and inquiry. Hence he did not speak at random nor in haste. The names we read out to him were different in some cases, he said, from those in use in Sheffield; but he knew the kind of work involved, and from a long practical acquaintance in mills and furnaces he could estimate within a trifle what each man's wages would be.

Speaking generally, the men worked by the turn, he said, and a day-turn lasted from six to five. In changing English money into American we have counted an English pound to be worth five dollars, and as this is more than its real value, the Englishman has that much advantage over the American in the following table. The first column gives the wages per day at Sheffield; and the second the minimum wages per day at Homestead under the new scale of the Carnegie Company (eight hours):

Occupation.	Sheffield, about.	Carnegie mills.
Heater	\$3.00 to \$3.50	\$6.67
Screwman	3.00 to 3.50	6.41
Heater, first helper	1.25	4.75
Heater, second helper	1.20	2.27
Craneman	1.25 to 1.33	2.66
Roll engineer	1.50 to 1.60	3.24
Roll tableman	1.13	2.47
Sweepers	1.00	1.86
Shear-tongsman	1.13	1.94
Stampers	1.25	2.06
Shearman	1.50	4.00
Shear tableman	1.13	2.27
Buggyman	1.13 to 1.25	1.94
Roller	1.00	8.20
Screwman	2.75	6.45
Tableman	1.25	4.60
Hooker	1.25	4.11
Sweeper, front	1.00	2.93
Sweeper, back	1.00	2.93
Shearman, first	1.50	6.45
Shearman, second	1.25	4.60
Leader, first	2.00	3.52
Leader, second	1.50	2.93
Heater	3.00 to 3.50	6.45
Heater's helper	1.25	3.52
Melters' helpers, first	1.75	3.26
Melters' helpers, second	1.50	2.66
Charging machine	1.00	2.86
Ladleman, first	1.50	3.26
Ladleman, second	1.25	2.66
Pitman, first	1.50	3.26
Pitman, second	1.00	2.66
Pitman, third	1.00	2.45

These figures will amply repay study. The courteous gentleman who gave them may have been a little at sea in some of his estimates; but when we had read them over to him, with the caution that we should prefer to have him give a figure in excess of what was paid rather than below it, he felt certain that, if he had erred at all, that was precisely the fault of which he had been guilty. That he can not be far

out can be proved from another source; for in a report of J. Schoenhof, late consul at Tunstall, to which our attention was directed by Mr. Folsom, then consul at Sheffield, we find a contrast drawn between a large steel-mill in Eastern Pennsylvania and another in England, which shows that, while the average daily wage for all employed in the former was \$2.174, the average for all in the latter was only \$1.33.

Our kind friend, as we were taking leave, pointed to a portrait on the sideboard. "There's a young fellow who's in America. He's a moulder." "What does he earn?" we inquired. "Three dollars a day." "What did he get here for the same kind of work?" "Six and eight pence," which is about one dollar and sixty-three cents.

After that we tried to escape from the awful smoke by an omnibus-ride to the top of the highest of the hills, where we supposed the poor manufacturers of Sheffield would be hiding their rags from the gaze of opulent workmen. We thought of them as being poor, because one of their number had spoken to us so strongly that very day of the tendency of our American system to build up millionaires. But what we saw on those towering hilltops, where the Browns and the Jessups and the Cammells have their abode, were not the huts of poverty by any means, but the pretentious inclosures of what could only be the castles and palaces of men rolling in affluence.

It is the earnest desire of the Dominion Government, we believe, to see a comprehensive iron industry established. We have within ourselves everything essential to it, and there is a large demand for all iron products. It was only through protection that the industry was built up in the United States, and now that country is the largest producer of pig iron in the world. Protection did it; and as is herein shown, the wages of ironworkers in the United States are very much higher than in Great Britain. Without protection Canada can never hope to establish an iron industry; side by side with the United States, ironworkers' wages in the two countries must of necessity be substantially the same. If no better than British wages are offered the Canadian industry will never eventuate.

#### OVER-PRODUCTION OF PROFESSIONAL MEN.

This journal has frequently protested against the existence of a legal system by which the property of certain favored ones in the community is exempt from taxation, and by which the sons of the rich are given educational advantages entirely unattainable by the sons of the poor. Millions of dollars worth of real estate, buildings and equipment in Toronto are exempt from all taxation. This property consists in schools, colleges and universities where large and efficient faculties are maintained at the public expense, and where young men, who might well be walking between plow handles and earning their living in agricultural pursuits, are galvanized into doctors of all sorts—of divinity, of medicine, of law and of horses and cattle; and it is a fact that any parent who can afford to contribute a small sum towards the expenses of a course in any one of these professions, and can afford to spare his son from the farm, can obtain for him all the advantages to be had in these institutions of learning, the Government bearing the expense. A poor man who cannot contribute even the small sum necessary to secure a professional education for his son, or who cannot afford to dispense with his services, needing his earnings to assist in providing for the helpless ones of the family, is denied for his son

the opportunity which the son of the rich man enjoys; and he enjoys the privilege of working very hard to enable him to pay taxes which go to support these educational institutions, their large faculties of professors and tutors, and the hundreds of students taught there. If it is just and right that the Government should, at large expense, teach some of the young men of the country to become doctors of divinity, law, medicine and cattle, it would be equally right for it to teach other young men to become blacksmiths, machinists, carpenters, shoemakers and electricians; for if one is done why should the other be left undone?

For years the universities have been graduating and sending out large numbers of young men who have been given all the advantages that could be obtained under such circumstances. The country is swarming with them; and in but too many cases their presence in the community has not been a blessing to it. Lawyers' offices are crowded with impecunious graduates and undergraduates, not one in a hundred of whom will ever make even a decent living in the profession. The supply being far in excess of the demand, shystering is resorted to; and the profession is degraded and brought into contempt by lawyers whose only hope of a living is in fermenting discord and rushing into court with cases that should never have been carried there. So, too, with the physicians; and it is this surplus in an honorable profession that supply the demand for abortionists and similar questionable characters. So, too, with those who graduate, or hope to graduate, in divinity. If a school board in a country village advertise for a competent teacher, it is the horde of applicants from the professional divines that offer their services at pay far below what a coal heaver or scavenger would earn. There are hundreds of country schools equipped with male teachers, great healthy, strapping fellows who ought to be splitting rails or carting manure to the fields, but who crowd out an equal number of equally competent young women who should have the situations. This sort of over-production of professional men is doing very much to the injury of the country. Work they will not, and to beg they are ashamed; and, so, instead of being good farmers or mechanics, contributing to the wealth and prosperity of the country, they are spongers and respectable tramps—some of them not very respectable—who are consumers but not producers. And this is the character of a very large proportion of the graduates into the so-called learned professions turned out of our universities every year.

This condition has become such a crying evil that even some of the professions are protesting against it, and no less a person than Dr. W. B. Geikie, Dean of the Toronto Medical College, has published a letter in which he takes the ground that the public of Ontario should not be required to pay for the education of doctors because such expenditure is unjustifiable. In his letter Dr. Geikie says:

Were doctors in Ontario so few in number, or very poorly educated in our Province as compared with medical men elsewhere, so that from their paucity and inferiority the public were really suffering, there would be some justification for the persistency with which its very few advocates in Ontario demand that the money of the people should be spent in helping to educate men for the lucrative profession of medicine. But the very reverse of this is the case. Our Province is well supplied with well-educated medical men, and those taught in our own colleges, at no cost whatever to the public, are equal in all respects to those educated elsewhere, and much superior



to large numbers of these. Indeed Canadian and especially Ontario educated doctors are in such demand in the United States that large numbers of them cross the line every year. No Government, Liberal, Conservative or coalition, could safely entertain the idea of giving State aid to any one medical college, and leave out all others. This has been attempted not long since, and on a rather large scale, and with disastrous results to the finances of the University of Toronto, which at the present time are unfortunately much crippled, and largely on this account. So we are not likely to have any more of this sort of thing in a hurry.

The people of Ontario in every constituency disapprove of giving young men professions at the public expense. They say and think, rightly, that they might as well, and even with greater reason, be asked to pay for teaching them the trades by which they expect to live. It may suit some countries to adopt a different course, but not Canada. Our people are even now enormously over-taxed—taxed for almost everything they eat, drink, wear, look at, or even almost think about—and, while we all hope that taxation may soon be materially reduced, it would be regarded as most unjust that our representatives should seek to add to our burdens by making us bear in whole or in part the cost of educating our doctors or lawyers. Nineteen out of every twenty of our taxpayers are utterly opposed to any such misuse of public funds—to misuse in any case whatever, but especially to such a hateful nuisance as the after-dinner speakers quoted appeared to favor, as would actually take money out of the public chest to aid any one of our medical colleges to the exclusion of every other.

#### THE COST OF BAD ROADS.

ON a recent occasion Bradstreet's sent out a widely distributed circular making enquiries as to the condition of neighboring country roads, the effects of the same upon prices of agricultural products and farm lands, on mercantile collections, etc., and in reply received answers from associations of wheelmen, farmers, editors, city and county officials, bankers and others at 313 cities and towns in twenty-eight of the States east of the Rocky Mountains.

An attempt was made, we are told, to arrive at a uniform basis for reporting the per capita county-road tax in all states covered by the report, but conditions underlying the raising of funds for road improvement differ in so many instances that no generalization from replies to this question is possible. It remains to be stated, says Bradstreet's, that with direct county or state appropriations for country road improvement, such as prevails in some portions of the east, the best class of roads are a result with little friction or disagreement. At the south and south-west, where are found the farming-out of road improvement to tollgate companies, the system of working county prisoners on the country roads, a direct road tax, and the requiring of men of from twenty-one to fifty years of age or thereabouts to work from two to six days on the road each year, or the payment of what is regarded as an equivalent sum of money—where all these systems of improving roads are employed results shown are far from satisfactory.

The southern half of New England appears to have fairly good interior highways, eastern Massachusetts leading, but second in all probability to New Jersey, which, lying between the great centres of population in southern New York and eastern Pennsylvania—appears possessed of relatively the best, most widely extended and most rapidly extending system of country roads of any similar area. Among roads reported in Ohio and Kentucky, there appear comparatively few which

are really good in the region covered by this investigation, when the best type of eastern New Jersey and Massachusetts country roadway is taken as a standard of "good." Many correspondents have declared roads good, but have admitted in another paragraph they were this, that or the other, distinctly not good. Many of the so-called "good roads," as reported, but not so published in Bradstreet's report, are so only under the most favorable conditions.

The foregoing outline of the general location of any noteworthy mileage of genuinely good country roads is corroborated by replies indicating the average periods during wet seasons when such roads are out of condition sufficiently to check wagon traffic. As there are no rainy seasons south, corresponding with those north, there are fewer reports of muddy roads from the south. Reports from Kentucky show an average delay to wagon traffic spring and fall of from one month to three months, and in some instances four months, in the southwest and in the west from two to three months, while in the northwest the delay is shorter.

From Maine to Texas and from Georgia to Minnesota prices of farm products have been advanced unduly because of delays to interior wagon traffic by heavy roads. In comparatively few instances no advance is reported because good roads have been in existence for a number of years, thus leading correspondents to report "no effect" on prices of agricultural staples due to bad roads. Quotations for potatoes, hay, butter and eggs, and almost all farm products, are included among those specified. In many instances prices of these products have been high in cities and towns, owing to scarcity, and the farmer, if roads would have permitted him to get to town and sell his surplus, would have been able to pay his road tax from the extra profit.

The effect of bad country roadways on mercantile collections, interest and discount rates can no longer be questioned, so many of our correspondents having pointed out an extremely unfavorable influence on mercantile collections, not only during the past spring, but in the spring and fall of preceding years. Many bankers and others having financial dealings with country merchants explain that rates of discount on country paper are largely influenced to the detriment of makers by bad roads, and the tendency among banks is to get remuneration for the annoyance of past-due obligations, with a disposition to curtail accommodations where prompt attention is not given.

As to the influence of good roads on values of farm lands, where there has been opportunity for intelligent reply (a large majority) it is shown that values of agricultural lands have been greatly increased by the improvement of roads connecting the same with towns and cities. It is only fair to add that there is a wide divergence in opinion as to how much the improvement in value from this cause amounts to, although three-fourths of the replies state the gain is not less than twenty-five per cent. Quite a number of these answers give a gain as low as ten to twenty per cent., and not a few state that replacing bad roads with good ones has advanced the value of adjacent property from fifty to one hundred per cent.

The progress made in the direction of attaining good roads, as reported, has been very uneven, and is best realized from results as shown in reports of really good roads, outlined in accompanying tabular exhibits. In some of the eastern and

middle and a few of the western states legislation has been secured rendering possible systematic work in the direction of permanently improving country roadways. The south is also beginning to wake up to this question.

Perhaps the most ambitious question among those sent out was that which asked for the "total direct and indirect excess cost annually to farmers and country merchants in your vicinity of bad roads, because of delayed or irregular wagon traffic in its effect on farm values, discounts, collections, etc.," and it is significant to note that while the number of replies is comparatively few, those which have been received are from exceptionally well-informed people in all instances, and lead to the conclusion that most of the estimates which have heretofore been made in public prints and elsewhere as to the aggregate loss of this character has been understated rather than exaggerated. In one instance four independent replies to the question (from a single county), ranged within \$10,000 of an alleged grand total direct and indirect loss there amounting to \$100,000 per annum from causes quoted above. Replies to the question have been made from almost all points of view, and calculated with care by farmers, bankers, merchants, county and other officials, and while they are not sufficiently numerous to render possible the compilation of a grand total of annual direct and indirect loss to agriculturists and others because of bad roads, etc., still they do render it plain that one or two years' losses in this direction would come near gridironing the country districts east of the Missouri river with roads which would compare favorably with the best macadamized or Telford avenues at larger cities anywhere in the United States. The heretofore prevailing estimate of the total annual road tax of \$120,000,000 is therefore probably less than one-half the total annual loss due to bad country highways.

#### EDITORIAL NOTES.

The Toronto Star has discovered that the "sweating" system prevails quite extensively in this city, and that certain unnamed clothing stores are supplied with garments made under this system. It is difficult to suggest a way by which this outrageous evil may be abated, but to our mind the general public, if it ever cares for those who are oppressed, could be educated to at all times avoid making purchases in stores where it is understood the articles offered for sale are the product of sweat shops. No doubt the "sweating" evil grows out of the constant and insane demand for "cheap" goods. This cry, be it said, does not originate with the general public who buy goods, but with those who sell them. The public are usually quite willing to pay a fair price for what they buy, but there is so much competition among those who sell, that the prices are cut to such ruinously low figures as to render it entirely impossible for those who manufacture the goods to do so at any profit except by reducing wages to starvation prices. The fact is, there are entirely too many sellers in the business. Owing to our methods of taxation, rents are entirely too high and merchants are punished by exorbitant taxation for embarking in business. These eat up much of what should be legitimate profits, and the scramble to sell large quantities of goods at ridiculously low profits leads to the system of sweating and cheap production that is ruinous to the laboring classes. If the public could be correctly informed as to who the deal-

ers are who handle the products of "sweat" labor, and avoid purchasing from them, but rather from those who pay fair prices to their workpeople, the question might be solved. "Cheapness" so called is the curse of any country where it is taught as being a great requisite to success.

AMERICAN manufacturers of agricultural implements are on a pilgrimage to Washington, protesting that free importation of Canadian implements will be the "annihilation" of American factories. Canadian manufacturers think that the free importation of American implements would merely "slaughter" their factories, and mangled fragments would still remain. The fortunes of the chief Canadian manufacturers could be reduced 35 per cent., and the chief American manufacturers 55 per cent., without slaughter or annihilation; and if the amounts subtracted were distributed among the purchasers, the proper results of freedom to purchase would be affected by improper methods.—Toronto Globe.

Agricultural implements are quite as cheap in both Canada and the United States at this time as they could possibly be were both tariffs removed. The American manufacturers desire the continuance of their tariff so that they may continue to enjoy the whole benefit of the American market, and the Canadian manufacturers desire the continuance of our tariff for the same reason. Without a tariff wall on certain occasions Canadians would be deluged with American goods, resulting in no permanent good to buyers but in untold evil to manufacturers, and the American manufacturers imagine that such a condition would prevail there under a change of circumstances.

THE condition of the unemployed in the United States has effectually upset the theory that democratic institutions are effectual in preventing the distress which occasionally affects the old world.—Toronto Globe.

Quite mistaken. The condition of the unemployed in the United States has effectually upset the Democratic theory that free trade would be a blessing to that country. They have not tested free trade there yet, but the promise of it, as made by Mr. Cleveland, has wrought the woe. From the temper of the people as expressed at the polls last November, and from the suffering now being endured, it is not possible that the Wilson bill can ever become law. The people won't stand it.

A protectionist Government that gives a contract for the building of a Government cruiser to outsiders has certainly not a leg to stand on. The Ottawa Administration preaches the doctrine of Canadian work for Canadian artisans, the encouragement of native manufacturing skill and all the rest of it, and then when it has a job of its own to be done to the tune of \$100,000 it goes to the old country with it. What does the Empire or World think about this? It is a poor doctrine that does not apply to the Government as rigidly as it does to all the rest of us.—Toronto Globe.

We are neither the Empire nor the World, but our opinion is that it is an exceedingly small piece of business. There might be excuse for this act if there were no establishments in Canada capable of building such a vessel as the one recently ordered by the Government from across the water. But we have excellent facilities for doing this class of work, and if bids had been invited from Canadian builders no doubt at least half a dozen would have been submitted from parties either of whom could turn out quite as fine and efficient a vessel as can be built on the banks of the Clyde. There is painful inconsistency in the Government preaching up protection

and the National Policy and the encouragement of Canadian manufacturing enterprise, and then going to Scotland for a three hundred ton vessel.

The exemption of church property in Montreal works more injustice in that city than in Toronto. There are two hundred printers out of work in Montreal, and they lay their want of work at the doors of the Christian Brothers, who carry on a printing business on property that is exempt from taxation. The exemption of property is becoming very unpopular in Toronto, and we believe if a vote were taken on it the principle would be denounced by two-thirds of the voters. We trust some member of the new council will adopt this infant as his own. As the popular vote decides the running of street cars on Sunday, why should it not also settle the question of exemptions? We are in for a plebiscit on exemptions. The most popular man in the council will be the one who will insist on a popular vote being taken on this question. We feel satisfied a majority will vote for their abolition. The ministers, of course, will not object to the people being given an opportunity of expressing their opinion. The aldermen cannot afford to deny the people the right of deciding this question. We trust some member will take the matter up in earnest and submit it to the people. If the Government were notified that the people desired exemptions abolished they would agree to the necessary legislation being passed.—Toronto World.

If the voters of Toronto were allowed to vote on the question of abolishing tax exemptions it would be carried by an overwhelming majority. Abolish tax exemptions and manufacturing industries would flourish.

A PRESS cablegram from London a few days ago stated that at a meeting of the unemployed held in that city, a man named Williams, one of the leaders of the idle workingmen, announced that a society was being formed in order to prevent evasion of the Merchandise Marks Act by foreign manufacturers. The society would also carry on an agitation to induce the public to refuse to purchase articles made abroad. He added that a committee, which would be composed of working men, would be appointed to approach the Government and the local authorities with reference to articles made abroad and paid for by the British taxpayers. He alleged that the boilers of English gunboats were made in France, and also that an order for 20,000 swords and bayonets had been placed in Germany. Williams further declared that the general post-office had given an order to Siemen, of Berlin, to lay a new cable from Liverpool to New York, at a cost of two million pounds. The London school board, he said, had its printing done abroad. The world moves. The voice of the unemployed British workman will be heard sooner or later. When the resolute cry "Britain for Britishers" goes up with sufficient distinctness, the work to be done for the British people will be performed by British workmen. This is simply the spirit of protection.

DURING the Mayoralty contest in Toronto, happily closed this week, the Telegram, which opposed the election of Mr. Kennedy, imagined that it made a strong point against him by showing that some three years ago Mr. Kennedy was interested in real estate in Mimico, a close suburb of Toronto, and rejoiced over the prospective prosperity of the place on the occasion of the laying of corner stones of four large factories, which have since been completed and put in active operation. He is quoted as having said on that occasion that

abundant capital was behind the factory men, and that the saving these men would make in reduced expenses—escape from city taxation—would enable them to successfully compete in the Canadian market. At that time Mr. Kennedy was not Mayor of Toronto, or a candidate for the office. He was, however, anxious to see Canadian manufacturing industries prosperous. He knew that more than \$20,000,000 worth of property in Toronto was exempt from all taxation, and that the taxes that should have been assessed against this property were placed upon the shoulders of the balance of the community. He knew that elegant churches into which the laboring man might not enter, and colleges and universities in which only the sons of the wealthy might be educated at the cost to the public, were exempt from taxation, but that factories, workshops and foundries, within the shadows of those luxurious churches and colleges, were taxed to death and forced to seek locations in more favored localities. Mimico will soon be within the corporate limits of Toronto, but because Mr. Kennedy desired to pave the way for that desirable event the Telegram held him up to ridicule.

A DESPATCH from Paris says that the wine growers in the south of France are so over-glutted with their produce that they offer wine at one penny per quart, but fail to obtain that price. The splendid vintage has made wine a drug on the market. New casks cost more than the wine needed to fill them. The vineyard and wine making industry in Canada has assumed very large proportions. Under the National Policy farmers who engage in grape culture are reaping rich and well deserved reward; and they find ready sale for all the grapes they can produce. The wine-makers, too, under that policy, have developed their industry and improved their methods until their products are esteemed equal to any made in France or any other country; and the cost of these most excellent native wines is such that any person in moderate circumstances may enjoy them. But it will be remembered that the Dominion Government have under consideration at this time a proposed treaty with France which would allow these cheap French wines to come into Canada practically duty free. It can readily be seen that if this were allowed, our grape growing and wine-making industries would be wiped out of existence in short order. We do not desire the admission of these cheap French wines into Canada.

THE decline that has taken place in freight rates in the United States during the past twenty-eight years is made plain in the following figures from the report of the Chicago, Milwaukee and St. Paul railway, which show the average rate per ton per mile received for freight by that company in the years named:

Cents.		Cents.	
1865	4.11	1880	1.76
1866	3.76	1881	1.70
1867	3.94	1882	1.48
1868	3.49	1883	1.39
1869	3.10	1884	1.29
1870	2.82	1885	1.28
1871	2.50	1886	1.17
1872	2.43	1887	1.09
1873	2.50	1888	1.006
1874	2.38	1889	1.059
1875	2.10	1890	0.995
1876	2.04	1891	1.003
1877	2.08	1892	1.026
1878	2.80	1893	1.026
1879	1.72		

At a recent meeting of the Toronto Trades and Labor Council it was recommended that the Ontario Legislature give municipalities the power to do away with all exemptions from taxation. This is a move in a right direction, and it is to be hoped that the agitation of it will not cease until such a law be enacted. There are other evils under which we labor quite as serious as this, but none more deserving of immediate attention. Of course, it would be impossible to abolish all exemptions. All public school buildings and the land upon which they are erected, should be exempt; and so should municipal buildings and parks; and also buildings and lands used for the purposes of provincial and general government. But churches and all private institutions of learning, and all such institutions where the children of the poorer classes are denied equal privileges with those of the rich, should bear their equal burden of taxes. There is a refinement of cruelty in taxing the cot of the poor man, resting within the shadows of the lofty cathedral, while the cathedral into which the poor man may not enter is exempt from taxation. Make the taxes bear uniformly and equitably upon all the land, but do not punish a man by heavy taxation for building upon and improving his land. Improvements should not be taxed. If this rule were observed—if we were free from the evil of exemption of property, and from taxes upon improvements upon the land, Toronto would have a dozen large factories and industrial establishments, giving employment to thousands of working people for each church or college that now exists.

ONLY fifteen years ago Great Britain produced just three times as much pig-iron as the United States. To-day this country produces 50 per cent. more than Great Britain. Since 1877 the world's product has nearly doubled; but the British production has made little or no advance, whilst that of the United States has increased 343 per cent. England in 1887 contributed 49 per cent. to the world's total. In 1892 she contributed but 25 per cent., while our own country advanced its share from 15 per cent. to 35 per cent. A few years ago American production of steel had insignificant proportions. At the present time we make as much steel as Great Britain, Germany, France and Belgium combined. These tremendous gains have been made under the influence of the protective tariff. They have placed us in a condition of independence of the world for our supply of one of the prime necessities of human life; and prices have fallen as they always do fall when domestic competition acquires considerable proportions. The prostration of the industry at this time is not due to over-production, for the total product of last year was taken up and consumed. It is attributable solely to the assault made upon the tariff by the party now in control of the government. There is no proof that the productive capacity of the American mills and furnaces is in excess of a fairly normal demand under conditions of national prosperity.—Philadelphia Manufacturer.

THERE has been in New England and in other sections of the United States for many years corporations known as water companies, that were organized for the purpose of supplying water power to mills and factories. They built canals, dams and everything necessary to carry water to customers that built upon the line of their canals; the customers furn-

ishing their own turbine water wheels, the water-power company charging a certain price for a given number of cubic feet of water per minute. The power companies kept everything in repair, up to the customers' property. This has been satisfactory to all parties. The same system could be cheaply done in many places by electricity, generated by steam or water. If by steam, it can be located where the power can be generated the cheapest; the company to furnish the wire for transmission, the customer to own the machinery that is on his own premises. By this arrangement, the power, being generated in large units, could be produced for much less per horse power than it would be possible to produce if divided into a number of small units. Probably the cost for fuel would be one-half less in favor of the large plant. The cost of all other things entering into the calculation would be in the same proportion; this would be a good dividend on the investment.

MR. C. C. LACY, of San Francisco, writing to the Engineer, of New York, calls attention to an interesting relic yet in existence at Burrards' Inlet, British Columbia, viz., the remains of the old Hudson Bay Co's steamer, Beaver, built by Messrs. Green, of Blackwall, London, in 1835, and launched in that year in the presence of King William and 160,000 of his subjects. Her engines and boilers were built by Messrs. Boulton & Watt, of Birmingham, and were of the side lever type, 35 H. P., each with double cylinders, 36 inches diameter, by 36 inch stroke. Her boilers carried a steam pressure of five pounds per square inch, and were of the old "leg type," and not easily got at for repairs. The Beaver, rigged as a sailing vessel, and accompanied by a convoy, left England for the Pacific coast in 1835, and after a long and tedious passage of 163 days, she arrived at Astoria, Oregon, in February, 1836, being the pioneer steamship of the Pacific. It was related to Mr. Lacy by her old captain that it was quite a common occurrence to stop at sea and raise her cylinder covers to repack the pistons, and that he often had to run up close to a landing and wait until there was steam sufficient to blow the whistle. It was customary, whenever a hole was blown in the boiler sheets, to fill a sack with ashes to serve as a temporary plug, and they would run for days in this state. The best parts of the hull have now been carried away by curio hunters.

MANY novel Australian imports are being introduced into British Columbia by Mr. Andrew Byrne, a business man from Brisbane, the Queensland capital, who has located in Victoria. The lines most prominent are preserved and prepared foods, and in these are several very interesting specialties. Preserved plum-pudding is one instance. Turtle-soup, made from the real turtles of Queensland, should put the mock-turtle into disfavor. Tins of preserved boiled rabbits also show that the Australians are making profitable use of the national pest, which epicures pronounce splendid eating when put up in this way. Potted dugong is a novelty here, but a noted Queensland relish. The dugong is an immense fish, often weighing from 1,500 to 2,000 pounds, and the flesh is such that when properly cured it resembles the best bacon, while the fatty substance is reduced into oil having the properties of the cod-liver article. Added to these specialties are the familiar potted meats and tongues; but the Australians boast that the fact of their only preserving the choicest parts gives their product a

great superiority. Preserved pine-apples, guavas, mangoes and other tropical fruits, and arrowroot, which makes a most delicious blancmange, go to make up Mr. Byrne's outfit.

A PRESS telegram from Bay City, Mich., a few days ago, was as follows: The proposed removal of the tariff on lumber in the Wilson Bill has but little terror for Saginaw Valley lumber men. There are few of them that are not interested in Canadian pine, and their business had reached at the point where Canadian interests must receive some concessions from the United States or the sawmills of the valley quit business. Since the export duty on logs was taken off by the Canadian Government, valley mills have practically lived on Canadian pine. During the past year upwards of three hundred million feet of logs have been brought across Lake Huron and converted into lumber by the mills of the Saginaw river and the shore towns. Canadian logs have furnished labor for the employes of fully fifteen large saw mills. Unless there is an export duty placed on logs this winter the amount brought over next summer will undoubtedly exceed that of the past year. Nearly all of the lumbermen have arranged for cutting as much or more during the winter. The business of rafting logs across the lake employs hundreds of men, who sort the logs and man the tugs which do the towing. One firm in Bay City, the Saginaw Bay Towing Association, have ten powerful tugs for the work. About half the output comes from Spanish River and the remainder from French River and Little Current.

It was a great political blunder on the part of Sir John Macdonald to remove the export duty on saw logs; and it has been a continual blunder ever since in not restoring that duty. About the only element benefitted by the removal of the duty has been the American owners of Canadian timber limits, and the owners of American saw mills. And now we see the queer object lesson of American lumbermen declaring that important concessions must be made in the forthcoming American tariff in favor of Canadian lumbermen and saw mills.

IN a letter to The Detroit Evening News Mr. Mark S. Wolcott, of Jackson, Mich., points out the advantages of a deep water canal system through the great lakes to the seaboard. Mr. Wolcott draws attention to the fact that the large lake vessels would then be free to do business on the high seas during the winter months. These vessels could continue in commission all the year round. They would be especially adapted for the grain and cotton carrying trade. This ship canal, it is pointed out, would be of more importance to the United States and Canada and to the world generally than any other canal built or proposed to be built. Mr. Wolcott has also great faith in Niagara Falls as a centre of electric power. He thinks it is not long before Detroit and other manufacturing centres will be supplied with Niagara Falls current, which from its cheapness and limitless quantity will enable American and Canadian manufacturers to compete successfully with the world, and pay a scale of wages that cannot be paid elsewhere. And the waters of Niagara after having furnished the power to manufacture articles will bear them oceanward though an enlarged Welland canal or a new Niagara canal to all the world. The writer in The News fears the scheme may be opposed by New York and its railways, and by England and Canada. As far as Canada is concerned we believe that there would not only not be any opposition, but the greatest enthusiasm in favor of an international project for enlarging the canals and permitting ocean-going vessels to penetrate the continent by way of the St. Lawrence to its very centre at Chicago and Duluth.—Toronto World.

We fear that this beautiful picture, like the baseless fabric

of a dream, will not withstand an application of cold facts. Does Mr. Wolcott, or the World, know, or have any accurate idea of what it would cost to enlarge and deepen the St. Lawrence canals and the Welland canal so as to make it possible for the large vessels now on the upper lakes having easy access to salt water. No doubt if the route were opened the vessels could continue in commission all the year round; and that the event, if it should transpire, would be of much importance to both Canada and the United States. To open the route would cost very much more money than Canada could possibly afford; and but a minimum of that cost would give us a quicker, easier and cheaper route between Lake Superior ports and the lower St. Lawrence. No doubt if the United States greatly desired the opening of the route suggested by Mr. Wolcott and the World, and was ready to put up the money for the purpose, a satisfactory arrangement could be made with Canada; but in our opinion, Canada is not prepared to shoulder any considerable part of the cost of the undertaking. It would be a folly for Canada to invest any big money for enlarging the St. Lawrence and Welland canals to a capacity permitting ocean-going vessels to penetrate the continent to its very centre, even with the assistance of the United States, when we have a shorter, better and cheaper route which should be opened.

THE Dodge Wood Split Pulley Co, of Toronto, write us wishing us a happy and prosperous New Year, and at same time thank us for the good we have done them in bringing notice of their product so prominently before the manufacturing public. We are glad to know that our efforts are appreciated, and have only to say that the Canadian Manufacturer wants to see every manufacturing establishment in Canada make the same progress and meet with as much success as the Dodge Wood Split Pulley Company has.

THE New York Manufacturers' Record has the following to say regarding some of the efforts that American manufacturers and their friends will put forth to defeat the passage of the Wilson tariff bill:

Anticipating the warfare which will be waged in Congress over the attempt to reduce the tariff duties on manufactured goods, by the party which controls the majority in that body, preparations are being made by those interested in our domestic industries to perfect an organization of the minority which shall offer the most effective opposition possible to the consummation of the scheme of tariff-wrecking which is in contemplation. To this end it has been openly urged that the manufacturing interests of the country shall demand of their friends in Congress that every available and lawful means shall be used to resist and obstruct the proposed legislation, whether it be in the House of Representatives or in the Senate, and that for this purpose a resort to all the arts known to the practice of filibustering will be perfectly justifiable to delay as long as possible the danger which threatens these industries. With such resistance, it is argued, and not without reason, that in the end the measure may be defeated, for it is not at all certain how far the changed sentiment of the country as demonstrated in the result of the recent elections, and particularly in Ohio, may influence legislators in their views upon this subject. It is certain, however that a policy of obstruction could not be employed in a better cause than that of defending to the last extremity our national industrial interests and with shrewd and careful generalship, of which the friends of protection may be assured, the disastrous force of the impending attack may be averted.

It has never been the policy of the Dominion Government to build up a thread manufacturing industry in this country, and consequently we have no such industry. Under the protective system in the United States, however, by which high duties were levied upon thread, branches of the most important British factories have been established there, giving employment to hundreds of men, women and girls. Whatever views the proprietors of these factories may have entertained regarding protection before they made investments in their American factories, they are now very pronounced protectionists as may be inferred from the following which we find in the New York Manufacturers' Review :

Some of our English contemporaries are complaining bitterly that managers of business corporations on this side of the Atlantic, which had their origin in Great Britain, are now to be found championing the cause of protection, and thus showing a woeful lack of loyalty to their progenitors on the other side. The criticisms referred to were called forth by the advocacy of the present rates of duty on sewing cotton by representatives of such establishments as J. & P. Coats, Limited ; the Clark Thread Company, the Clark Mile End Spool Company and the Kerr Thread Company, all of which are well-known names and at once suggestive of the principal firms of thread manufacturers in Scotland. As a matter of fact, all these firms are actually offshoots of the leading English and Scotch concerns, and they were originally established here by foreign capital, simply for the purpose of taking advantage of the American tariff system, under which they have reached their present state of prosperity. That they have identified themselves with the interests of the country is only natural, and it is not strange that they should now be found among the foremost to protest against any change in our tariff laws, which would affect them disastrously, in common with all other manufacturers whose capital is invested in industries which have grown up under the protective policy. The very fact that they appear in opposition to tariff smashing is one of the strongest arguments that could be advanced to show how vital to the interests of manufacturers in the United States is the maintenance of protective duties. Despite the interests which these concerns represent in Great Britain, they do not hesitate to sound the alarm when the foundation of their prosperity is threatened. The fact is, the American branches of these firms are in a much more flourishing condition than their older foreign establishments, and their action in presenting to the Ways and Means Committee a protest against any reduction in duties is clearly dictated by an enlightened self-interest.

It is perfectly legitimate to inquire whether the present is a proper time to revise the tariff. Apologists for the purpose of Congress to proceed with that work were eager to deny that business would be injured or hampered by it. They are no longer so positive about it. Unable to wholly deny the connection between the present widespread distress and continued prostrations of industry and the determination of Congress to revise the tariff, they now are praying that body to expedite its work, believing that the sooner we know our fate the easier will it be for us to prepare for it. It was not enough, however, that our business should have been overwhelmed by a financial panic, but even in the midst of that storm

of failure and contraction we are offered a radical bill on the tariff, the good effects of which no man is able to foresee, but whose immediate evil is to increase the business and industrial distemper. Temporary extensions have become permanent, and the proportion of uncollected debts is increasing. There is a continued shrinkage in the incomes of all classes which shows no signs of relaxation. Business timidity is increasing. As a recompense, we are asked to urge speedy action on the tariff bill. But recent experiences with that body in the way of legislation gives us little encouragement. "Business will be from hand to mouth," says the New York Post, "until a decision is reached. Then, no doubt, there will be a sudden revival, all the more marked by reason of the previous scrimping and savings." We are glad that the Post has found people who have been enabled to save in these times, but we regret to note that it used almost the same language in relation to the repeal of the Sherman law. The loss of income to the farmers by reason of the lower prices, is variously estimated at from \$200,000,000 to \$300,000,000. It is evident that the purchasing ability of this class has received a heavy blow. The numbers of the unemployed in the large cities is steadily increasing and the situation has become so serious at some points as to lead to municipal action in the way of providing work upon public undertakings. This will for a time remedy, in some slight degree, the loss of wages. But the most unpleasant feature of such cases is that they give undue encouragement to the notion that the Government is an unfailing resource for idle workmen.—American Banker.

Few incidents of recent occurrence have been more regrettable than the announcement of the intended suspension of the felt goods works of Alfred Dolge at Dolgeville, Fulton County, N. Y., which is to go into effect next week. Mr. Dolge had applied the principle of profit sharing in his factories more extensively and successfully than any other man in the United States, and the result was not only great prosperity to himself but to all his employees. The number of hands to be laid off is about 500. Mr. Dolge says that after taking account of stock and learning the prices at which importers will sell their goods under the Wilson bill, wages will be reduced correspondingly, and he hopes in this way to be able to resume in about a month. But he adds : "If hard times continue we will import all our goods. We cannot stand hard times and the Wilson bill too." And this will be the end of his profit-sharing in America.—Troy, N. Y., Times.

DOES boiler inspection pay? North Dakota has been experimenting with the question in a practical way, trying one year with, the next without. The year the inspection law was in force it got through the threshing season without a single explosion. The bill was then repealed, and the season just closed has witnessed seven explosions and seventeen fatalities. If human life is worth anything in Dakota, inspection pays.—Power.

THE Globe thinks it has a correct idea of what raw materials are. It says : "Iron ore is raw material to the manufacturer of picks, hammers and drills ; and it is equally true that picks, hammers and drills are raw materials to the miners of iron ore." This is quite a glum glimmer of intelligence. It would

be interesting to see a workman with hammer and tongs work up a chunk of iron ore into miners' tools. The process is not a familiar one even to experienced workmen, but the Globe tells us that iron ore is the raw material of which miners' tools are made. And it is equally strange that picks, hammers and drills should be raw materials to the miners of iron ore, but the Globe says that that is true. Some people think that tools cannot properly be called raw materials in any industry, but the knowledgeable Globe says they are.

HENRY Goebel, whose claimed invention of the incandescent lamp as now used was so prominent a topic in electrical circles, and in suits in the courts relative to the validity of the Edison patent, during the past year, died of pneumonia, December 4, after only a week's illness, at his home in New York City.

MR. HIRAM WALKER, of Walkerville, has resolved to provide work for eighty unemployed men at Panquet Station, ten miles from Walkerville, on the Lake Erie and Detroit River Railway. Eight hundred acres are to be cleared, and the men, if of good record and deserving, will get employment pulling stumps and cutting wood. This kind of help in these dull times will be appreciated. The worthy man who can work never desires charity money.—London Advertiser.

A STEP in the direction of government recognition of the eight-hour day is the decision of the British Government to reduce the hours of labor in the ordinance factories to forty-eight per week, without cutting down the wages. The ordinance factories are appropriate for a commencement of the reform and perhaps it would be well were it possible to reduce the working hours till none remained. But it is gratifying that a start has been made and it may well be hoped that the good work will not stop with the one branch of the nation's service.—Toronto News.

It would be a great inducement to a long suffering community to advocate the suggestion of the News to reduce the working hours of laboring men until none remained, if it would result in closing up a concern that thinks that human labor can be abolished by Act of Parliament. A Kansas State official desires to discount this move on the part of the British Government and make two hours a legal day's work. Why two hours? Why one hour? A law stating that a certain number of hours shall constitute a day's work may be operative in many instances, but cannot possibly be in all. Where such a law is practicable it is well enough to have it, but circumstances alter cases. Poverty and want cannot be abolished by law; and a hungry stomach is no great respecter of law. If it is right to enact a law restricting the hours of labor in a factory, why not enact a law restricting the hours of labor in a wheat field or potato patch or cabbage garden?

THE Empire tells how on a recent occasion the London Times was the means of elucidating the law for the benefit of newspapers, and had done a real service by obtaining an injunction restraining the publication of a garbled extract from its columns. After explaining wherein the garbling was done, our conscientious Empire says:—"There is a salutary lesson in all this for many writers on esteemed contemporaries. We will also make a note of it ourselves." There is said to be

much joy among the angels over the repentance of a sinner; and we also rejoice to observe that compunction of conscience has overtaken a delinquent newspaper. In this connection we recall an act of mean garbling on the part of the Empire which we made a note of at the time. A couple of days before Hon. Mackenzie Bowell, Minister of Trade and Commerce, left Ottawa on his recent Australian trip, he addressed a note to the Secretary of the Canadian Manufacturers' Association in which he alluded to his unavoidably sudden departure for Australia for the purpose of conferring upon trade matters with those colonies, and requesting the secretary of the Association to make it known to the manufacturers who might desire to extend their trade in that direction, that they should send to him their catalogues, price lists, etc., without delay to Victoria, B.C., before his sailing from there on September 16. Mr. Bowell, in having a care for the interests of manufacturers, and knowing that they could be best communicated with through their Association, wrote to the secretary as above; and that there might be all expedition in imparting this intelligence, the secretary sent a uniform notice of it to all the Toronto morning papers, including the Empire, asking publication; the same information being also sent out as a press despatch so that papers in other cities might publish the notice. All the morning papers, except the Empire, published the matter substantially as sent to them, but the Empire butchered and garbled the item out of recognition, entirely ignoring the Manufacturers' Association and suppressing the fact that the communication from Mr. Bowell was to that organization. The Empire draws much if not all its sustenance from the manufacturers. It pretends to be a good friend to them; and it is certain that without their support it could not long battle against the effects of the current of coldness of its own engendering that flows toward it. No doubt, it thinks it exhibits much wisdom in suppressing, as far as possible, any mention of the Manufacturers' Association, and in garbling beyond recognition valuable information sent out by it. We are pleased, however, to learn from it that it has made a note of the salutary lesson taught by the London Times.

ALL reports of naval officers and builders of war vessels go to show that in the few years since the construction of the new navy was begun the cost of building a vessel in the United States has fallen 33½ per cent. With the advantages steadily accruing to our builders there is every reason to expect that in a few years more the cost of production will closely approximate that of foreign builders.—Marine Review.

During Mr. Cleveland's first term as President of the United States he did all that he could do to discourage the employment of American naval designers and architects in the building of the new navy which was then just begun. No native genius was great enough in his opinion to undertake the enterprise and conduct it to a successful conclusion, and it is well known that his antipathies in this direction were the cause of the financial failure of one of the best and most successful shipbuilding concerns in the world. The American people have great and just pride in their new war vessels, but they appreciate the fact that the exit from office of Mr. Cleveland and the entree of Mr. Harrison was the signal for the employment of American genius and the development of an original and effective American navy.

An official comparative statement made by the United States Government of the commerce passing through the St. Mary's Falls Canal during the seasons of 1892-1893 shows as follows :

	1892.	1893.
Vessels, number.....	12,580	12,008
Tonnage, net tons.....	10,017,283	9,849,754
Tonnage, freight.....	11,214,383	10,700,572
Coal, tons.....	2,904,200	3,008,120
Flour, barrels.....	5,418,135	7,420,674
Wheat, bushels.....	40,001,780	43,481,052
Other Grain, bushels.....	1,000,000	2,405,314
Iron Ore, tons.....	4,901,132	4,014,550

Of the 12,008 vessels passing through the canal in 1893 8,379 were steamers. The canal was open for navigation in 1892, 233 days, in 1893, 219 days. The estimated value of freight passed through the canal in 1893 was \$145,436,956. The value per unit of some of the items of freight were : Coal \$3.50 per ton ; flour, \$4 per barrel ; wheat, 75 cents per bushel ; manufacturers' iron, \$50 per ton ; pig iron, \$17 per ton ; iron ore, \$3.50 per ton.

Reyon says that the basis of the negotiation for a fast line of Atlantic steamers is the willingness of the Canadian Government to increase the grant from \$500,000 to \$750,000 a year. The Napiers of Glasgow are named as the parties of the second part. A considerable time has elapsed since the question of a fast Atlantic line was raised, but for Canada the delay will be found not to have been without its uses. A fast line of steamers is a phrase which has acquired a new meaning in the last two years. Then it was not certain whether a further gain in speed was possible or not ; since

then a considerable gain has in fact been made. And what has been done makes it probable that further conquests can be made. If we had got a fast line two or three years ago, it would now have been out of date and would have ill responded to its name. The gain of the delay is that we shall get a better start when we do set out. The faster the vessels, the more costly they are. The old subsidy was found insufficient to tempt any company to accept it ; we have found that we must increase it if we are to get what we want.—Monetary Times.

Let us see what it means for Canada to have a fast line of Atlantic steamers at a cost of \$750,000 per year. At a rate at which Canada can now borrow money, by the annual payment of \$750,000 some \$20,000,000 could be had ; or, in other words, the payment of such a large subsidy to obtain a fast line of steamers is equivalent to an investment of a capital of \$20,000,000. It is well to enquire if at this time Canada can indulge in the luxury of paying \$750,000 a year for a fast steamer service when there are other enterprises of even greater importance, which would cost no more and which are not yet undertaken. Of what use would fast steamers be to any person in Canada except, perhaps, to the few wealthy ones who might be induced to travel on them. Such steamers do not accept as freight such produce as Canada desires to ship abroad. They would not carry away our surplus wheat or cattle, nor would they bring to us any of the heavier lines of merchandise which we import, such as iron, steel, and heavy articles which can bear only minimum freight charges. If quick passages across the Atlantic are desired, it would be

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GENERAL MANAGER SEARGEANT says that the Dominion tax on coal costs his road alone \$260,000 a year. No wonder that it is hard to make ends meet on Canadian railways.—London Advertiser.

The Canadian Pacific Railway is said to be one of the best paying roads in America. It is not a loop line, and there is no need for the ends meeting.—Canadian Manufacturer.

This rejoinder is intended for a joke. But it in no degree meets the statement of fact chronicled.—London Advertiser.

The Grand Trunk and Canadian Pacific railway companies should be the last to say aught about what it cost them in the way of duty on coal. Under what we think was a most mistaken policy, they have always been allowed to import their rails free of duty; and at this time they have more than two million tons of rails in use in Canada upon which not one cent of duty was ever paid, and not one ton of those

rails was made in Canada. If a duty of only \$6 per ton had been collected on those rails, the same as is collected on similar rails for street railways, the treasury of the country would have been enriched to the extent of about \$12,000,000, and if in the first place the Government had imposed such a duty, and had offered a bonus of say \$6 per ton for a few years upon the production of steel rails in Canada, we would have had a steel rail industry long ago. Canada is not lying awake of nights crying over the fact that the railways have to pay duty upon the coal they import. Canada would be but too happy to know that they had to pay duty on rails also.

SUGAR will be cheap this year, but not as cheap as it would be if the sugar lords of Canada were not enabled by law to collect tribute from every consumer of this necessary to the average family. A very heavy crop of sugar is coming for ward, estimated at 350,000 tons excess in Cuba and 400,000 tons excess in Germany, besides large increases in France and Austria, so that the world's supply for this year will be about 1,000,000 tons excess. The price of raws will naturally be much lower than ever before, and there should also be a substantial reduction in refined but for the impost mentioned. The healthful competition of British-refined sugar is needed.—London Advertiser.

This journal, as is well known, is no warmly attached friend of the Canadian sugar monopoly. It is desirous of seeing cheap sugar in Canada, and it would be delighted to know that the healthful competition of British sugar had brought down

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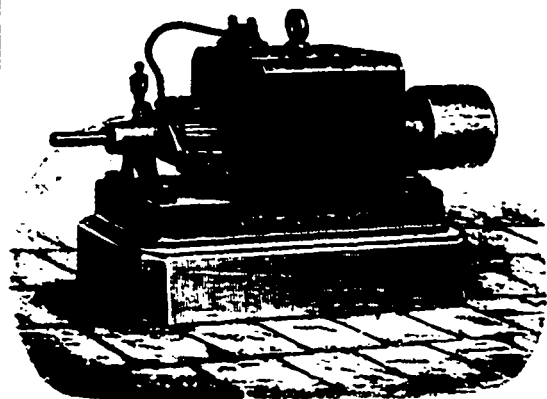
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Manufacturers and others requiring Dynamos of the above sizes will do well to correspond with us before buying elsewhere. Prices given on other sizes, which can be delivered at short notice. We can furnish all supplies lowest prices. Correspondence solicited.

JOHN STARR, SON & CO. (Ltd.)

General Canadian Agents  
"Lahmeyer" Electric Light System,

Illustrated Catalogue on application.

HALIFAX, N.S.

the price to a point measured by the true intent of the National Policy and the ethics of protection. The present duty of \$16 per ton on refined sugar is entirely too high, and the standard of sugar which may be imported free of duty is entirely too low. The American duty of \$10 per ton is unnecessarily high; and our Government would do well to adopt the American standard of sugar which may be imported free of duty. Before the American sugar tariff was adopted the average value of refined sugar in that country was only about one cent per pound above that of raw sugar; and with present appliances it ought not to cost as much as one cent per pound to produce refined sugar from the raw. The Advertiser calls attention to the fact that a very heavy crop of sugar is now coming forward, Germany alone producing an excess of 400,000 tons, besides large increases in France and Austria, the excess of the world's supply this year being about one million tons. Germany, France and Austria produce beet sugar exclusively; and Canada is as well adapted to produce the article as any country in the world. One way to crush out the Canadian sugar monopoly would be to encourage the beet sugar industry here; but neither the Advertiser nor any other political paper in Canada, Grit or Tory, will advocate the measure. One is afraid to and the other dare not.

One of the curiosities of the great exhibition to take place next year at Antwerp will be a literal castle in the air. We understand that a company has been formed to carry out the plan of M. Tobianski, an ingenious engineer, who has designed a sort of raft, having an area of about 180 square

feet, and made of bamboo canes and steel and aluminum piping. Upon this is built a most luxuriously fitted up restaurant. The raft is held floating in the air at 500 feet from the ground by a number of balloons; and an arrangement of anchoring by means of cables will, says M. Tobianski, prevent the restaurant from rocking even in the strongest wind. Two small captive balloons, each holding from eight to ten persons, will serve as lifts to keep up communication between the aerial restaurant and the earth. There is to be a regular system for supplying gas to the balloons, and at night the exhibition will be lit up by an immense electric light projected from the raft. The whole thing can be lowered to the ground, by specially constructed windlasses, in about ten minutes.

A Boston fire company has been making experiments with a bicycle fitted out with a small chemical tank and fire hose. The tank holds about two gallons of chemicals, which amounts, as an extinguisher, to about twelve pails of water. The bicycle has cushion tires and with its entire outfit weighs about sixty pounds.

WHAT is this continual cry for cheapness going to end in? How much farther is it possible to go in the endeavor to increase quality at lower prices? It seems as if the limit had about been reached, and yet hardly a month passes without the invention of some machine which is claimed to reduce the cost of manufacturing shoes. Each year the factory superintendent is crowded down a few per cent. in the limit of ex-

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MANUFACTURERS OF  
**CARBON POINTS for all Systems of Arc Lights,**  
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 And all kinds of **PORCELAIN for ELECTRICAL and**  
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All goods guaranteed equal in quality to the best manufacturers in the world.

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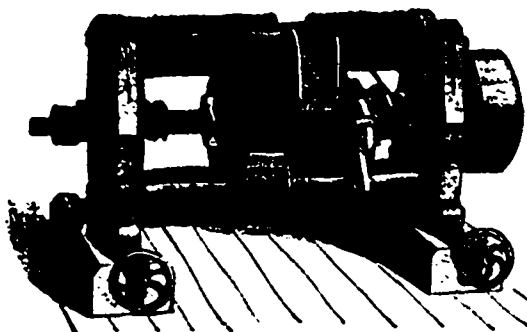
## KAY ELECTRIC CO.

Manufacturers of



HAMILTON ONT.

**DYNAMOS**  
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**ARC and INCANDESCENT LIGHTING.**  
**PLATING MACHINES,**  
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 And all kinds of  
**ELECTRIC APPLIANCES**



**THE RELIANCE ELECTRIC MANFG. CO., Ltd.**

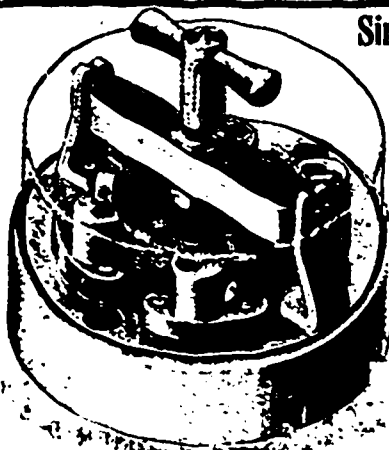
Manufacturers of The Reliance System of Arc and Incandescent Lighting

and Power Apparatus. The R.R. System of Electric Railway.

Head Office and Works - WATERFORD, ONT.

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Single and Double Pole  
**SWITCHES**

From 5 to 150 Amperes.

**DOVETAIL ROSETTES.**

**LAMP SOCKETS.**

All of Superior Workmanship and Design.

Manufactured by the

**PERKINS' ELECTRIC SWITCH MFG CO.**

Hartford, - Conn

For Sale by the Canadian General Electric Co., Toronto.

pense for each style of shoe, and a little improvement is expected each year. The shoe trade never takes a backward step. It is always progressive. But there is a limit to all things, and there must be a limit to this cheapening process. The time has about been reached when further cheapening of cost will of necessity be at the expense of quality. Better have good shoes at higher prices, than poor trash at lower values. Let us have a continuance of increased quality, but let it be paid for. Never a step backward will in this way remain the slogan of the trade.—St. Louis Shoe and Leather Gazette.

THE canal that is to unite the North Sea with the Baltic—a work conceived and begun by Bismarck—is said to excel, from an engineering standpoint, the Suez, Corinth and Manchester canals, while its commercial and strategic importance fairly entitles it to rank as “the Suez Canal of Europe.” The canal will extend from Holtenau on the Kieler Fjord to Brunsbittel on the River Elbe, a distance of sixty miles. At Grunthal, the watershed between the Elbe and Eider is passed, and over the gigantic cutting, at a height of 130 feet above the water surface, has been built a railway bridge with a span of 470 feet. At normal water level the canal will be nine fathoms deep, and it will have a width of twenty-two yards on the bottom, and of thirty-six yards on the surface at lowest tide. It will be free from locks and sluices along its entire course, but at each end a double gate will guard against dangerous tides. The work will be completed in a few months, the construction time to be seven years, and the cost will be about £8,000,000.

SECRETARY CARLISLE has received from Special Agent Ira Ayer his report on the production of tin and terne plates in the United States during the quarter ended September 30, 1893. During that time thirty-five firms manufactured 27,145,480 pounds of tin and terne plates proper, against an output of 39,513,587 pounds by the same number of manufacturers during the previous quarter. Of the output for the quarter 8,794,027 pounds were made from sheets rolled in the United States. Of the output of commercial plates 13,861,163 pounds were coated with tin and 13,284,317 pounds were terne coated. Nearly 96 per cent. of the commercial plates belonged to the lighter class. The production of black plates was 11,355,368 pounds, of which 8,147,092 pounds were of the lighter class. The production of the previous quarter was 20,988,513 pounds. Of the thirty-five firms that made sworn returns of the manufacture of commercial tin and terne plates,

twenty eight used American black plates wholly or in part. The aggregate consumption of American plates in the various forms of the manufacture was equal to 86 per cent. of the entire production of such plates.

THE New York Shipping and Commercial List states on what it considers good authority that the distillation of crude petroleum yields as follows:

	Per cent
Illuminating oil.....	76
Gasoline, Benzine or Naptha.....	11
Lubricating oil.....	3
Residuum.....	10
	100

Crude mineral oil includes all natural oils, without regard to gravity; and naptha includes all lighter products of distillation.

**T. R. WADSWORTH ESTATE.**

TENDERS FOR LEASING

**WESTON MILLS, WESTON, ONT. AND FARM PROPERTIES.**

The Toronto General Trusts Company, administrators with will annexed of the estate of the late Tom Rodney Wadsworth, will receive tenders up to

**Thursday, the 15th February, 1894,**

for leasing for a period of five years the well-known and valuable flour mill, with complete roller system, known as

**Weston Mills, Weston, Ont.,**

with the land and premises attached thereto, excepting the residence and grounds and cottage opposite formerly occupied by the late Mr. T. R. Wadsworth.

The mills are situate on the Humber River, at Weston, and are worked by never failing water power. In connection with the mills there are a brick office, two dwelling houses, a number of sheds and other outbuildings.

An extensive and lucrative business has been carried on for the past six years, and a good connection has been formed.

Tenders will also be received up to Thursday, the 1st day of March, 1894, for the lease for five years of the whole or portions of the following farm properties, regard being had to the buildings situate thereon:—South half lot 21, lot 22, east half lot 22, and the east 20 acres of lot 21, concession B, Township of Etobicoke; also those parts of lots 22 and 23 lying eastward of the Concession road, between concessions B and C of the said township and extending to the roads known as Scarlett's road and Wadsworth's lane, excluding thereout and therefrom the said Scarlett's road and Wadsworth's lane, the lands comprised in St. Phillip's church and parsonage grounds, the right of way of the Grand Trunk Railway and all other public roads; the whole containing about 225 acres more or less.

Possession of the mill property may be had on the 1st day of March and the farm properties on the 1st of April next.

Parties tendering for the mill property may also tender for the whole or any portions of the farm properties, regard, however, being had to the buildings thereon.

The highest or any tender not necessarily accepted. For viewing the premises apply to Mr. Charles Wadsworth, at the mill office, on Mondays, Wednesdays and Fridays, between the hours of 10 a.m. and 6 p.m., and for plans of the property and further particulars apply to him or to

**THE TORONTO GENERAL TRUSTS CO., Administrators.**  
Cor. Yonge and Colborne Sts., Toronto.

January 16th, 1894.

WHEN WERE  
YOUR  
**BOILERS**  
LAST  
Inspected?

CONSULTING ENGINEERS:  
**G. C. ROBB, Chief Engineer**  
**A. FRASER, Secretary Treasurer**

**JOHN L. BLAKIE Esq.**  
PRES.

**E. W. RATHBUN Esq.**  
VICE-PRES.



OF CANADA

Head Office: TORONTO.

Are you  
Sure  
THEY ARE  
**SAFE**  
AND IN  
GOOD  
CONDITION?

A STRANGER, riding on a Montreal Street Railway car on one of the hill routes, would be apt to notice an individual standing beside the motor man, holding in his hands a massive weapon closely resembling a sledge hammer, the only difference being that the head is of wood. If he were of an enquiring turn of mind and ventured to ask the use of the aforesaid instrument he would be surprised to learn that it is the only safety appliance at present used by the street railway company in the leading city of Canada, in the event of the hand brakes refusing to work, as has occasionally happened. In emergencies where it has been called upon, the result has proven that as regards efficiency it is comparatively useless, the heavy car either pushing it aside or crushing it to match-wood. The effect on the nerves of the passengers sitting in a car over which the brakes have lost control, descending at an increasingly rapid rate, on suddenly coming into contact with this block of wood, may be more easily imagined than described; and the effect on one of the unfortunates handling it was such that he was not likely to repeat the experiment.

There seems no reason why the Westinghouse or similar air brake system as used by steam railways could not and should not be used as an emergency brake on electric cars. The only question would be that of expense, and considering the danger to cars, to say nothing of lives, should not stand in the way of the improvement. To equip an electric car with such brakes it would be necessary for each station to be provided with an air compressor and each car to carry a cylinder of sufficient capacity. As they would only be used in case of emergency the expense of charging would be infinitesimal, and the first cost would really represent the whole outlay. If a trolley wheel could be had which would stay on the wire, or rather climb back on to it should it get off, a suitable electric brake might be found. Electrical News.

The Westinghouse Electric and Manufacturing Co., at Pittsburgh, Pa., has contracted with the Niagara Falls (N.Y.) Power Co. to furnish it with three dynamos of 5,000 h.p. each, which are said to be the largest electrical machines of the kind ever attempted.

**ECO MAGNETO**  
**WATCHMAN'S ELECTRIC CLOCK**  
WITHOUT BATTERIES

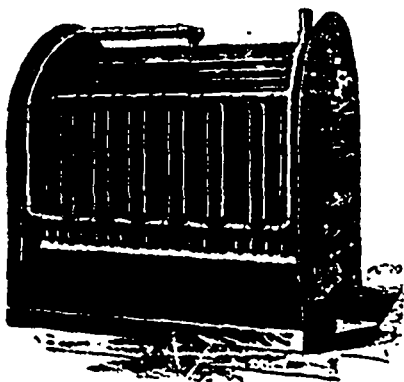
Write for Descriptive Circular to

**Eco Magneto Clock Co.**

Room 71 - 620 ATLANTIC AVE.

**Boston, Mass.**

**MONTREAL ELECTRIC CO., Agents for Province of Quebec**



THE

**Finlayson Water Tube Marine Boiler**

FOR

**YACHTS, LAUNCHES AND OTHER STEAMERS**

The most efficient and reliable Water Tube Boiler in the market. Has entirely new features and improvements.

Send for Illustrated Catalogue of Boilers and Engines

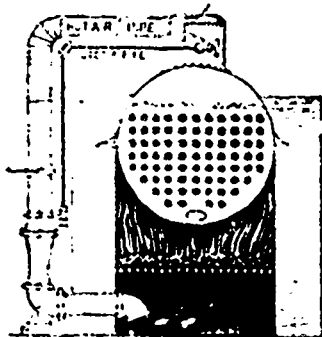
**DOTY ENGINEERING WORKS**

DOTY BROS. & CO., Proprietors

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**STEAM AND AIR INJECTORS, EXHAUSTERS, Etc.**



For burning hard and soft coal, coquina, run mine and lump coal under Steam Boilers, exhausting air and vapors from buildings, ventilating ships, mines, etc.

Highest Medal and Diplomas given at the World's Columbian Exposition, Chicago, 1893.

The best Blower in the market for Steam Boilers.

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**S. R. EARLE**

**BELLEVILLE, - - ONT.**



**The Babcock & Wilcox Co.**

**WATER TUBE STEAM BOILERS**

Now being manufactured in Canada

Agents for the Dominion

**A. HOLDEN & CO.**

Waddell Building - 30 St. John St., MONTREAL

Send for book "STEAM" free on application.

The following cement is recommended as excellent for steam and water pipes, having been found to be very useful for pipes having to resist fluid pressure. Mix five pounds Paris white, five pounds ocher, ten pounds litharge, five pounds minium and four pounds of black oxide of manganese, and add a little asbestos and boiling linseed oil. The cement is reported to become almost as hard as the iron itself.

A novel electric lock has been invented especially for use on windows, which by means of this device may be left open one or two inches for ventilation and be quite as secure as when completely closed. The lock operates with ease by simply pressing a button, and can readily be connected with the fire or police alarm service, so that any unwarranted tampering with the window or mechanism will be immediately followed by a report at the fire or police station.

Electricity is now used in traction, in illumination, in telegraphy, submarine and terrene, in engineering, in medicine and surgery, in agriculture, horticulture and floriculture, in many kinds of mechanism, in manufacturing, in heating, in cooking, and in yet other service. There are thousands of miles of electric railways, a new electric ship is nearly completed at one of our Pacific ports, and we have a promise of a new kind of electrical balloon. This is the electrical age as well as the age of steam. We cannot put any limit to the uses of electricity. There may be other agencies of nature yet undiscovered that will hereafter be serviceable to mankind. It is likely that there will be great times in this merry old world within the next thousand years. New York Sun.

The sawmills in Lake City, Mich., have been experimenting with steam-chests to take the frost out of logs before sawing. The logs are run into this steam chest before going into the mill. The chest is supplied with exhaust steam from the mill, which melts the ice from the log and takes the frost out, aiding very materially in the work of sawing. The plan seems to be successful. Supply World.

We have heard the expression "low water in the boiler" so often that it has become a veritable chestnut, and we have long wanted to have something more scientific take its place. A writer in Locomotive Engineering has come to our relief. It appears that a certain locomotive engineer failed to keep a proper supply of water in his boiler, the result being a burned crown sheet, making extensive

repairs necessary. He reported the matter on the book as follows: "Owing to a temporary deficiency of dampness on the roof of the furnace of engine 70, the active combustion of carbon produced edoric intensity sufficient to permanently derange the contour of the sheet, suspend active participation of this locomotive in the transportation department, and require the employment of skilled artisans and mechanical appliances, unattainable at the time and place of such unsolicited and unexpected derangement of crown sheet and schedule, caused by procrastination in the application of appliances for the introduction of water to the interior of the boiler."

My ideas have undergone a change on the subject of making rivet holes, writes Robert Guinness in the Tradesman. I used to think that punched holes in iron plates were weaker than those which were drilled. I now find that they are really a trifle stronger if they have been properly punched. The reason is that there is a sort of flow of metal around the punch. When it starts in through the plate it makes a slight depression in it before any metal appears on the other side; then when the plug falls out it will be found of less density than the plate from which it was punched. Some of the metal has been forced from before the punch into the walls of the hole, making a kind of bushing of compressed iron which renders that hole less liable to tear when shearing strain is placed upon it than if it had never been so reinforced. For steel plates I still stick to the notion of the desirability of either drilling the rivet holes or reaming them out after punching, the reason being that the operation of punching effects a sort of tempering of the walls of the hole, and the metal thus tempered is more brittle than it was before having this change effected in it.

## FOUNDRY FACINGS

Core Compozad, Ceylon Plumbago, Foundry Supplies and Moulding Sand.

CANADIAN AGENTS FOR

Rort's Positive Blower

Colliau Cupola Furnace

HAMILTON FACING MILL CO., Hamilton, Ont.

Montreal Agents, DARLING BROS.

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We carry in stock and make to order every description of Wrappings, Pulley Board, and Press Papers. Fine Cartridge Hosiery a Specialty.

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Special attention to letter orders.

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## Dominion Wire Manufacturing Company

MONTREAL AND TORONTO.

Wire Drawers, Galvanizers

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**IRON WIRE BRASS  
STEEL WIRE COPPER**

FOR ALL PURPOSES

Also

Steel and Brass Wood Screws, and Wire Nails.

Crescent Coat and Hat Hooks, Steel and Brass Jack Chain.

2 and 4 POINT BARS and PLAIN TWIST FENCING.

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## DENNIS' Tubular Steel Barrows

COAL  
DIRT  
FOUNDRY  
ROLLING MILL  
and FIG IRON

BARROWS

FOR HARD WEAR, STRENGTH AND DURABILITY THEY ARE SIMPLY UNEQUALLED.

Though "Extra Strong" they are not heavy to handle.

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DENNIS WIRE AND IRON WORKS, LONDON, ONT.

## Michigan Emery Wheel Company

194 Catherine Street, Detroit, Mich.



Solid Emery

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Corundum  
Wheels

To Run Wet or Dry Special Shapes

PERFECTION  
SAW GUMMERS

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The most dreadful storm ever experienced in England, known as the "Great Storm" occurred on the night between November 26th and 27th, in the year 1703. The devastation which it caused was immense. The loss sustained in London alone was calculated at two millions sterling. The number of persons drowned in the floods of the Severn and Thames, and lost on the coast of Holland, and in ships blown from their anchors and never heard of afterwards, is thought to have been about 8,000. Twelve British men-of-war, with more than 1,800 men on board, were lost within sight of British shores. Trees were blown up by their roots to the number of 1,700 in Kent alone. The Eddystone Lighthouse was destroyed, and in it the ingenious contriver, Henry Winstanley, and the persons who were with him. Multitudes of cattle were lost; in one level 15,000 sheep being drowned. Among other vessels in the British Royal Navy that were lost were the Stirling Castle, with seventy guns, and the Mary, with the same number; the Northumberland on Goodwin Sands, the Vanguard, which sank at Chatham, and the Yorke, lost near Harwick, each with seventy guns, only four men escaping from the last; the Resolution, with sixty guns, on the Sussex coast; the Newcastle, with sixty guns, off Spithead, 193 being drowned; and the Reserve, with sixty guns, off Yarmouth, when 170 perished.

For official test of the electric motor as applied to canal boats at Rochester, N.Y., the Rochester Electric Railway Company undertook to supply 500 volts, and the apparatus was designed to do its work under these conditions. Owing, however, to the fact that the return depends for its integrity upon the fish plates of the old Park Avenue Street Railway track, the electrical construction of which is not yet completed, the actual voltage during the test was reduced from 200 to 250, with a current of 60 amperes, making about twenty electrical horse power. During the official test the shaft made about 60 revolutions per minute, and the speed of the boat approximated four miles an hour against the current and the wind. The extremely difficult curves, the lock and the bridges furnished typical conditions in canal work and were taken without difficulty, and the test, in all respects, was very satisfactory to the canal officials and the eminent electricians who watched it with intense interest. In case, as is generally understood, the power of Niagara Falls should be utilized, the Tesla multiphase system of transmission will be adopted, by which the current will go out at a very high poten-

tial to transformers placed at convenient points along the canal, these transformers reducing the potential sufficiently for practical working purposes. In actual practice there will be one complete circuit for east-bound boats, and another complete circuit for west-bound boats, similar in all respects to the double trolley for double-track street railways. When it is considered that the average speed of canal boats, with mules, hardly exceeds two miles per hour, and that the whole freight carried on the New York State canals now approximates close to 5,000,000 tons per annum, it will be apparent that the saving of but the fraction of a dollar per ton amounts up to a very large sum.

The Royal Electric Company of Montreal, will, so it is said, establish works at Carleton Place, Ont., where at least 100 hands will be employed. This move is contingent upon the bestowal by the municipality of Carleton Place upon the Royal Electric Company of a bonus of \$20,000 and exemption from taxation for a term of fifteen years.

Messrs. Robin & Sabor, Montreal and Toronto, manufacturers of oak-tanned leather belting, have sent us a card which explains itself as follows: Wishing you the compliments of the season, and with the hope that last year has been a profitable one for you, we are pleased to say that our business for 1893 has been most satisfactory. Notwithstanding the keenest competition, we have secured an ample share of the belting orders given by the manufacturers of Canada, and have sustained our reputation for turning out a thoroughly first class belt. This year we are prepared to do better than ever, having steadily increased our stock of belting in all sizes, both in our Montreal and Toronto house, so that we can supply customers without any delay. This is an important point to be considered, for not only do users of belting get what they want at once, but they get a well-seasoned belt, not one that has been made up in a hurry from fresh leather. With an increased tanning capacity and a large amount of well seasoned leather in our belt factory, we count on keeping this stock well replenished, an advantage that will enable us to supply customers at the most reasonable figures, and at the same time keep up the excellent quality of our goods. Our travellers are on the road and will undoubtedly call on you. Should you require anything before they see you, a card sent us, will receive prompt reply with prices and all information desired.

# The Sturtevant Progressive Lumber Dry Kiln

Complete .  
Plans . .  
Furnished .  
With . .  
Each . .  
Apparatus.



Absolutely Safe .  
AS A  
**FIRE RISK**  
QUICK DRYING  
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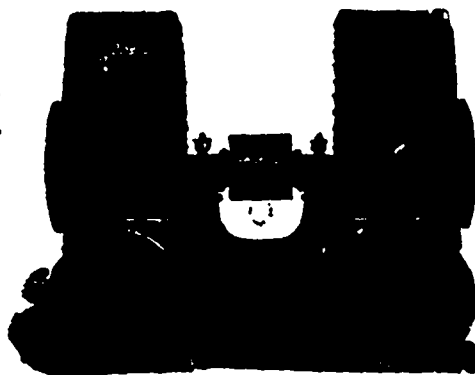
## THE STURTEVANT Steel Plate Exhaust Fans

For Removing Refuse  
from Wood-working Machinery

SEND FOR CATALOGUES

### B.F. Sturtevant Co.

BOSTON, MASS., U.S.A.



DOUBLE EXHAUSTER

## 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.*

Mr. E. D. Tilson, Tilsonburg, Ont., is making valuable improvements in his flour mill.

Mr. J. Fair, Clinton, Ont., has introduced a complete system of automatic fire protection in his flour mill.

Messrs. Hilshorn & Brubacher, Berlin, Ont., are placing considerable new machinery in the flour mills there recently purchased by them.

Over \$100,020 worth of mica was produced in Canada during 1892, being an increase over the preceding year of nearly \$30,000. A part of this, amounting to \$68,466, was exported, mostly to the United States for electrical purposes.

A telegram from Gabarus, N.S., states that the Rev. Dr. D. Sutherland had discovered on Gabarus Lake, one of the greatest beds of "red hematite iron ore," it is supposed, in the world. It has been tested by Dr. Selwyn of Ottawa and it is of excellent quality.

The flour mill of William Keith at St. Thomas, Ont., was destroyed by fire December 26. Loss about \$4,000.

Arrangements have been made to build the Hamilton, Grimsby and Beamsville electric road and connect the same with the Niagara Falls River and Park railway, if possible. The directors of the new road have placed an order for 1,300 tons of steel rails. The line has been surveyed and the right of way granted. It will probably be in operation by next July.

The New Jersey Match Company, with head offices at Philadelphia, have leased premises in Ottawa and will introduce machinery for sawing blocks for the manufacture of matches. The company will purchase three inch deals from the local lumber mills, cut them into suitable lengths and ship them to the home factory where they will be made into matches.

On the occasion of the roofing in of the new factory building of the Eagle Knitting Company in Hamilton, Ont., a few days ago, the proprietors celebrated the event by giving a splendid supper to the masons, bricklayers, carpenters, tinsmiths, plumbers, painters and others employed in the construction of the building.

The McMaster Manufacturing Company, Orangeville, Ont., manufacturers of boilers, machinery, etc., will remove their works to Brampton, Ont.

Letters of incorporation have been issued to the Toronto Stock Yards and Abattoir Company, with a capital stock of \$500,000. The members of the company are John Hallam and David Watson Alexander, merchants; Archibald John Thompson, butcher, and Edward Thomas Carter and William George Fisher, accountants, all of the city of Toronto. The objects of the company are to buy, sell and slaughter live stock; to manufacture, pack, can, export and generally to deal in dead meats; to manufacture from the company's raw materials any products, including fertilizers, and to establish stock yards, slaughter houses and factories.

The American Rattan Company, Toronto, of which Mr. C. G. Pease is manager, are sending out their 1894 trade circular having reference to the goods manufactured by them. Special reference is made to their Heywood patent baby sleeper carriage which, they say, is something new, and what the babies cry for. We see no good reason why babies should not enjoy sleeping carriages if sleeping cars are essential to grown people who travel. The circular informs us that this company are the largest makers in Canada of children's wagons, velocipedes, girls' tricycles, boys' bicycles, etc., and that they are leaders in rattan goods. This company are manufacturing baby carriages with the Fax patent running gear, the object of which is to provide a practical means whereby the carriage may be turned in any desired direction without tilting up the front wheels, which has always been a source of annoyance and cause of injury to the carriage. This gear is so simple in construction that a child can handle the carriage with ease and safety.

## E. LEONARD & SONS

LONDON - - CANADA

MANUFACTURERS OF

## ENGINES AND BOILERS

(NEW DESIGNS)

STEAM PLANTS EQUIPPED FOR ALL PURPOSES

Highest Economy, Regulation Perfect. Send for Circular. Interviews Desired.

THOS. NOPPER, - Sales Agent

79 YORK STREET, TORONTO, ONT.

## ARMINGTON & SIMS

AUTOMATIC HIGH SPEED ENGINES

FOR -  
Electric Lighting

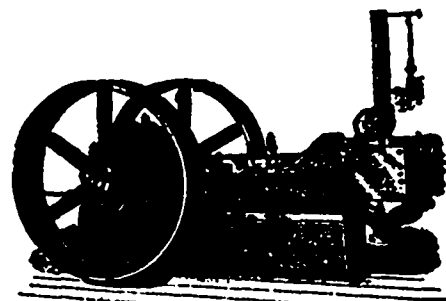
- AND -  
GENERAL FACTORY PURPOSES

Perfect Regulation and Highest Economy.

STEAM PUMPS  
SHAFTING, PULLEYS

AND -  
General Machinery

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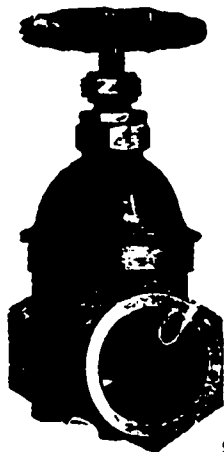
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The Canada Paper Company, through their Toronto manager Mr. F. J. Campbell, has sent us a very handsome and useful memorandum calendar, for office use. It consists of a large number of sheets of various kinds, colors and qualities of paper manufactured by the company, a description of each being printed upon each specimen; each sheet being a calendar for each of the weeks of the year. A diagram in the calendar shows sizes and card prices of the patent Imperial shipping tags manufactured by the company.

Messrs. Moore, Hall & Fisher, the proprietors of the Victoria Chemical Works at Victoria, B.C., have merged their business into a stock company called the Victoria Chemical Company, with a capital stock of \$100,000. The goods heretofore manufactured were sulphuric, nitric and muriatic acids. The new departures will include sulphate of copper and baking powders. In addition to the buildings required to cover the manufacturing plant, there is a complete mechanics' shop, engine room and electric dynamo for lighting purposes. Situated on the waterfront, with a wharf of their own, the company are in a position to handle their raw material and the finished product very advantageously and cheaply.

The Nelson Hydraulic Mining Company, Nelson, B.C., has been established to take over the mining lease and rights of J. F. Hume, Joseph F. Ritchie and George W. Richardson. The stock will be \$100,000.

Mr. John McMurehy is putting in an additional set of 48-inch cards in his woolen mill at Huttonville, Ont.

The Victoria Woolen Mill at Almonte, Ont., after lying idle for more than five years, has been again put in operation making blankets. C. W. Cunningham is superintendent, Samuel Mackenzie, boss carder, John Scott, boss spinner, and D. Dunlop in charge of the weaving department.

The Ottawa Car Company, Ottawa, of which Mr. W. W. Wylie is manager, have been awarded the contract for building eleven electric tram cars for the Hamilton, Grimsby and Beamsville Electric Railway Company. Three of these will be cars for fruit and milk. The others will be fitted with plate glass vestibules in front for the protection of the motormen, will have Maguire trucks and all the latest improvements. Several of the cars will be short, four-wheeled coaches, and the remainder will be long eight-wheeled cars, especially adapted for long-distance running.

A syndicate of Detroit capitalists are completing arrangements to re-open the mines in the extensive sulphide ore fields near Belleville, Ont. The proposed move depends largely upon the success of a new process of separating the gold and arsenic from the ore which has been suggested by Dr. Eames, of Detroit, although it is probable that work will be started in any event.

The Shuswap Milling Company publish a memorandum of association, with James McIntosh, John Andrew Mara and James Vair, all of Kamloops, B.C., as trustees. The intention expressed is that the new corporation shall take over the business of the Shuswap Milling Company, the Kamloops Waterworks Company and the Greely Creek Shingle Mill Company. The capital stock is stated at \$100,000.

Daniel R. Young, Albert F. Griffiths and William R. Robertson, all of Vancouver, B.C., give notice of association as the Boston Bar Gold Mining Company, limited liability, with a stated capital of \$50,000. Their principal object is to carry on mining operations at Boston Bar, on the Fraser river.

The business of the Victoria Chemical Company, Victoria, B.C., is for the future to be carried on by a limited liability company of that name, of which the memorandum of association has just been published by J. W. Fisher, J. A. Hall, Frederick Moore and Walter Morris, all of the city. The capital stock will be \$100,000.

The Dominion Chemical Company, with head offices at Montreal, are applying for incorporation with a capital stock of \$10,000 to manufacture glue, grease, animal charcoal, fertilizers, bone products, etc. Alfred Conn, Adolf Schweizer and O. M. Harris are to be the provisional directors.

J. P. Wiser & Sons, (Ltd.), Prescott, Ont., have been incorporated with a capital stock of \$500,000 to take over the business of J. P. Wiser & Sons, manufacturers of whisky, etc.

Messrs. Joyner & Elkington, proprietors of the Qu'Appelle (Man.) Valley Flour Mills, have been making some extensive alterations in their mills. They have put in a new steam plant, and increased the capacity to 120 barrels, at a cost of \$6,000, and are contemplating building an elevator.

Fawcett's iron foundry and machine shop at Sackville, N.B., was destroyed by fire December 24. Loss about \$75,000, throwing some 75 men out of employment.

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Proprietors of Sault au Recollet Paper Mills.



The corporation of the city of Toronto have granted to the McDonald Rolling Mill Company, this city, whose new rolling mills are at Sunny Side, in the western portion of the city, on the lake shore, exemption from taxation on two acres of land upon which the mills are built, and upon all buildings and plant contained thereon. At least 35 persons must be employed for not less than ten months in each year.

Messrs. Thomas Connor & Sons, St. John, N.B., carriage manufacturers, have been awarded a contract by the Dominion Government to equip the new binder twine factory at the Kingston Penitentiary. The capacity of the machinery to be put in will be to employ about 40 men. An expert foreman will be employed, at a salary of \$1,500. It has also been decided to purchase at first 300 tons of manilla fibre, the raw material. The department has been in communication with firms in Galv and New Jersey to purchase the plant, but these negotiations have apparently failed, and under the contract with Mr. Connor he will be at liberty to purchase the machinery where he pleases. The vote taken in Parliament provided for an appropriation of \$20,000. The amount of Mr. Connor's contract is not known.

The woolen mill at Innisville, Ont., formerly operated by Mr. Berryman, has been taken over by Mr. D. Ferguson, of Renfrew, Ont., and will be run on etofees.

Mr. Routh, of Cobourg, Ont., has taken over and will operate the woolen mill at Campbellford, Ont.

An electric snow sweeper manufactured at the Peterborough works of the Canadian General Electric Company for the Kingston, Ont., Electric Street Railway is thus alluded to by the Peterborough Review: It is entirely of home manufacture, the wheels, axles, iron work of the frame, body and fittings were all made at the works. The length over all is 21 ft. by 6 ft. width and very strongly

built and braced. The axles are cushioned on rubber. Two 25 h. p. single reduction motors propel the sweeper. The motors are of the well known type made at the company's works, and which are giving such a high percentage of efficiency wherever used. The sweeper has a tractive force equal to that of fifty horses. The sweeping mechanism is driven by a 25 h. p. motor set diagonally across the floor of the car. From the shaft of the motor two sprocket wheels and chains carry the power to the brushes below the car. These are placed at an angle to the track one in front

**Accountant's Work**

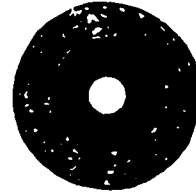
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Cuts every substance with unexampled rapidity; always sharp; every face never dressed. As much more durable than other stones as they are harder. Never glaze; grind everything. Most Rapid Grinder known.

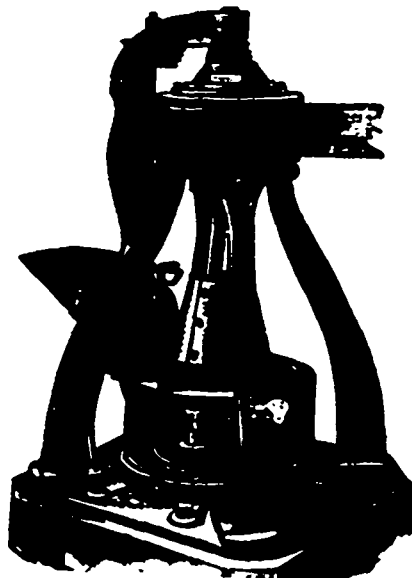
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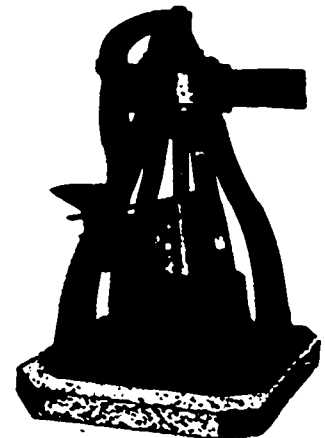
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and one in rear of the car. Each brush clears a width of 6 feet. Together they clean a space 12 feet wide, as wide as a two track rail. The revolving brush used by the hair dressers shows, in miniature, the way in which the brushes are constructed, lengths of rattan being used instead of hair. Wire, steel rods and other material have been tried but none found so suitable as the rattan. A system of levers controls from the inside of the car the height above the rail at which the brushes shall be set, and to allow of this alteration in height an ingenious arrangement of the mechanism has been made. The motors underneath the car are protected from an accumulation of snow by waterproof canvas. From three to four men are required to handle the sweeper in heavy weather, one to direct the movement of the car, one at the rear and one at the motors inside the car. The starting, stopping and reversing mechanism are of the type manufactured by the company and adapted to meet the particular needs of the service. The body of the car is covered in with the usual framework and roof, with windows in the sides and ends. In building the sweeper a number of improvements have been introduced. Experience gathered from the working of these machines has suggested alterations. In fact the perfect sweeper will be a matter of evolution. While making improvements in construction, the builders have been careful to carry their efforts further, and if possible add to its efficiency by ensuring that the work of clearing shall be done at a less expenditure of power. The sweeper is fitted with two, one for each motor, of the company's series-parallel controllers. As compared with the ordinary style of controllers there will be a saving of nearly one-third in the power required. It is not necessary here to describe, in a technical way how this is accomplished, but the results are as claimed.

The Toronto Steel Clad Bath & Metal Company, Toronto, have sent us their 1894 illustrated catalogue descriptive of the steel clad metal bath manufactured by them. This article is described as follows: This new sanitary bath is constructed with an outside shell of steel and an inside lining of planished copper. Being made entirely of metal, except the rim, which is of polished cherry, or other ornamental wood, it will not decay, rust, or corrode, and is always absolutely clean and free from smells. The bath is supported by four ornamental iron feet, and the exterior is susceptible of being very handsomely decorated. They are made in three sizes, and of both the French and Roman patterns. So well proportioned and compact are they that they weigh only about 100 pounds, thus doing away with the objection on the score of weight, so often urged against the solid iron or porcelain tubs.

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**ROOFING**

It is superior to any other Roofing, and unequalled for House, Barn, Factory, or Out-Buildings: it costs half the price of shingles, tin or iron: it is ready for use, and easily applied by anyone: it is the best Roofing in the market, in durability, to all others.  
Send for estimates, and state size of roof.

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The best known Paint in the world for Tin, Iron, or Shingle Roofs, Fences, Sides of Barns and Out-Buildings. It costs only 60 cents per gallon, in barrel lots, or \$1.50 for a five gallon tub. Color dark red. It will stop leaks in tin or iron roofs that will last for years. It is guaranteed not to peel, crack, scale, nor wash off, and is fire-proof against sparks. TRY IT.

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300 square feet. \$3: keeps building cool in summer, warm in winter.

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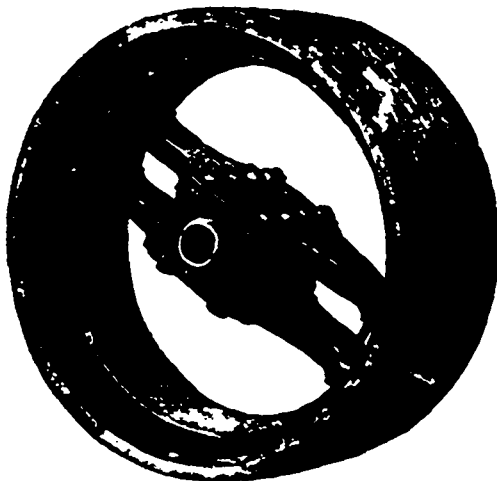


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**68 KING STREET WEST, . . . TORONTO**

Messrs. Darling Bros., proprietors of the Reliance Works, Montreal, have sent us an illustration of a newly patented boiler tube scraper manufactured by them, and which they say is the simplest and most effective tube scraper on earth. It cuts the scale, cleans the tube, and carries all accumulations forward in one operation.

The Almonte Knitting Company, Almonte, Ont., will place an additional set of cards and more knitting machines in their factory.

Almonte seems now to be still rising in prominence as a manufacturing town, and may be called at once the Huddersfield and Leicester of Canada. Besides the new knitting factory of D. M. Fraser, mentioned elsewhere, a new blanket factory is now being fitted up by J. B. Wylie, son of J. H. Wylie; and D. Shaw, of the hardware firm of McLuski & Shaw, of Almonte, has started a new firm called Wylie & Shaw, and they will manufacture blankets. The mill will have a capacity of two sets of cards, and will start work on six looms, to be increased shortly to ten. The mill will be operated by water power, and is expected to be running in January.—Journal of Fabrics.

Messrs. Slingsby Bros., Brantford, Ont., manufacturers of blankets, wincey, etc., have transferred their woolen mills and business to the Brantford Mfg. Co., in which they hold a large interest.

The Yarmouth Duck & Yarn Company, Yarmouth, N.S., have just completed a substantial warehouse 90 x 25 feet in connection with their mills.

Messrs. Cross & Nicklin, Stewartown, Ont., manufacturers of Dongola, calf, sheep, kangaroo and other fine leathers, have discovered that their present plant is too small for their rapidly growing business, and are seeking a favorable location elsewhere at which to erect a branch tannery and works, to give employment to from 75 to 100 hands.

Messrs. Ferguson & Pattinson, Preston, Ont., are building a large addition to their woolen mill.

Mr. John Baird's woolen mill at Almonte, Ont., is being equipped with an electric light plant.

Messrs. Gillies, Son & Co., Carleton Place, Ont., are adding considerable new machinery to their woolen mill, including several Crompton looms.

Messrs. Gemmill & Son, Perth, Ont., are placing some new machinery in their woolen mill.

The factory of the Halifax Shovel Company, at Halifax, N.S., was destroyed by fire January 10. Loss about \$22,000.

The factory of the Auburn Woolen Company, at Peterborough, Ont., is being supplied with a new fulling machine.

Messrs. Sykes & Ainley, Glen Williams, Ont., are placing a Fatham mule with 308 spindles in their woolen mills.

The Gillies Brothers Company, Carleton Place, Ont., are applying for incorporation with a capital stock of \$200,000 to take over the business of lumbering and manufacturing lumber now being carried on by Messrs. James, William, John and David Gillies under the name of Gillies Brothers.

Half a dozen of the finest specimens of mica ever brought to Ottawa are now to be seen at the office of the Ottawa Gas Company in that city. They were taken from Mr. W. F. Powell's mine in the Township of Aylwin, and are said to be fair samples of this wonderfully rich deposit. The crystals are four feet in length and three in width, and weigh on an average 400 lbs. a piece. An assay of this mica made in Philadelphia recently gave the most satisfactory result. The mine is now being extensively operated and the prospects for its future development are very encouraging.

#### HIRAM MAXIM ON LEAKY TUBES.

AFTER all that has been said regarding the leaky tubes in boilers, I think we may conclude that the only cause of leakage is the overheating of the tubes at the firebox end. It would appear that when only natural draught is employed, the natural circulation of the water in the boiler is sufficient to displace the steam between the tubes, and to prevent the tubes from overheating, but whenever a forced draught is employed, then the natural circulation of water is not sufficiently great to displace the steam which is being rapidly developed at the firebox end of the tubes; the result is that the tubes soon become very highly heated, and loosened in the tube sheet. I believe there can be no question but what this is the cause of the leaky tubes, which have been so much discussed lately, and that we will admit that if there was a very rapid circulation of

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The Discs are furnished all complete and ready for use and may be put into one of these valves by simply unscrewing the bonnet of the valve, slipping off the old disc, replacing it by a new one, and screwing on the bonnet again, requiring only a few moments' time for the entire operation.

The Stuffing Boxes are all packed before they leave the factory with VULCANIZED ASBESTOS PACKING, which is very durable, and cannot be blown or washed out. Only first quality new metal is used.

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pure water directly through the spaces between the tubes, no over-heating could possibly occur.

This being the case, it would appear that the rational thing to do is to employ a forced circulation of water in the boiler whenever a forced draught is employed.

Some propose to pump the water out of one part of the boiler into another part. This, if done on a sufficiently large scale, would no doubt diminish the difficulty to some extent, but in marine boilers under a forced draught is there any such thing as solid water to pump?

In experiments which I have been conducting during the last two years, I find that where the fire is very hot and the heating surface very great in proportion to the water, a forced circulation is a *sine qua non*, and that this is very easily accomplished without the aid of any other machinery than that already employed on shipboard. Suppose that the boiler pressure should be 150 pounds to the square inch; I should then have the pressure of my feed water 200 pounds to the square inch, and should have it escape from the feed pipe into the boiler through a small orifice, which may be automatic, and which will maintain a constant difference of pressure of fifty pounds to the square inch between the water in the feed pipe and in the boiler. This will give a solid stream of dense water escaping through an orifice with a force of fifty pounds to the square inch, and this can be made to operate on ten times its volume of the surrounding water in the boiler after the manner of an injector.

In its application to a marine boiler the water jet would suck water from the coolest part of the boiler and force it directly between the tubes in the hottest part of the boiler. Thus we should have a constant stream of solid water impinging on the tube sheet and the ends of the tubes exposed to the highest temperature. It is a plan very easy and cheap of construction, applicable to any kind of boiler, and a complete remedy for the evil referred to. In my experiments I find it is all that can be desired. The placing of iron thimbles in the ends of the tubes is only an expedient. These thimbles are expensive, they rapidly burn out, they obstruct the draught, and, by covering up the most effective part of the tube, they diminish the power of the boiler, and consequently the speed of the ship. In expressing my firm belief in the efficiency of this system, I must, however, plead guilty of having patented it, and therefore of being an interested party. - Safety Valve.

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## GOBELIN TAPESTRY.

A much admired feature of the French section at the World's Fair was the display of Gobelin tapestry.

For over 400 years the products of the Gobelin factory have been the chosen textile decorations for the apartments of European royalty. No other carpets or mural fabrics have the same quality of substance or workmanship nor anything like the same price. For a square inch of carpet \$20 may be considered a pretty steep price, but ten times that sum has been charged for an especially artistic creation from the looms of the Gobelins. There are small Gobelin tapestries in existence that cost the steady labor of six men for five years working constantly fifty hours a week. Perfect proficiency in the art of weaving Gobelin is not attained, so the authorities say, within a lesser period than forty years. Frequently a weaver entering the factory as a boy twelve years old works there a lifetime and dies at an advanced age before a single tapestry is finished.

The famous Gobelin factory is one of the sights of Paris. At all times except two specified hours the establishment is securely closed to every one except those employed there and the proper officers of the French government. The Gobelin is owned by the State, and the officials whose duty it is to attend to the national carpet-weaving are most vigilant in the performance of their duty. There are processes of wool-dyeing and manipulation in weaving said to be known to the Gobelins only, and those professional secrets are jealously guarded.

It was in 1450 that this celebrated establishment was founded.

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Young Man, with Thirteen Years Practical Experience in all Branches, wants situation in Woolen Mill.

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Gentlemen, - Your Belts are all I can possibly wish for. The only trouble is they were put on tighter than proper, as I expected them to stretch, but "hang it all" there seems to be no slack up to your belts, they are there to stay.

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## J. L. GOODHUE & CO,

Mfrs. LEATHER BELTING, Danville, Que.

Toronto Office, 35 YORK ST.

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Jean Gobelin, whose name the concern bears, was a dyer on a little stream on the Blevre, whose waters enjoyed a repute for a peculiar quality which assisted the production of certain rich tints. The family of Gobelin emigrated from Holland into France, and some of their descendants and connections have for centuries been employed in the tapestry works of Paris.

All the operatives are people from the middle class of society, and are noted for their high intelligence and artistic appreciation. They enter the establishment as boys, are given a careful education in a special school maintained for the purpose by the State, and the course of instruction includes a thorough knowledge of the chemistry of dyeing, careful direction in the art of drawing and painting, besides the groundwork of a good literary schooling.

As far back as 1025 there was a tapestry factory at Poitiers, in France, and the product of the looms was reserved solely for churches, kings' courts and men of distinction. The art of tapestry was a craze in the middle ages, but its palmiest days were under Louis XIV. Then the Gobelins were in clover. Louis was in the habit of working at the looms himself, and in such high favor did he hold the carpet-weavers that by royal decree free breweries were erected adjoining their hotels, and beer was supplied them for all time at the expense of the king's purse.

But the revolution of 1792 demolished the carpet works and burned its treasures. Under Louis Philippe they prospered, but another revolution came and once more their delicate productions were given to the flames and the establishment itself razed to the ground.

Some seventy-five men and some 200 boys are employed in the Gobelin factory. The work is better than it ever was. Poetry and sentiment are given form and color in their silken threads. They are artistic luxuries which only the very rich can afford.

#### THE LOUDEST NOISE EVER HEARD.

No thunder from the skies was ever accompanied with a roar of such vehemence as that which issued from the throat of the great volcano in Krakatoa, an islet lying in the Straits of Sunda, between

Sumatra and Java, at ten o'clock on Monday morning, August 27, 1883. As that dreadful Sunday night wore on, the noises increased in intensity and frequency. The explosions succeeded each other so rapidly that a continuous roar seemed to issue from the island. The critical moment was now approaching, and the outbreak was preparing for a majestic culmination. The people of Batavia did not sleep that night. Their windows quivered with the thunders from Krakatoa, which resounded like the discharge of artillery in their streets. Finally, at ten o'clock Monday morning, a stupendous convulsion took place which far transcended any of the shocks which had preceded it. This supreme effort it was which raised the mightiest noise ever heard on this globe.

Batavia is ninety-four miles distant from Krakatoa. At Carimon, Java, 355 miles away, reports were heard on that Sunday morning which led to the belief that there must be some vessel in the distance which was discharging its guns as signals of distress. The authorities sent out boats to make a search; they presently returned, as no ship could be found in want of succor. The reports were sounds which had come all the way from Krakatoa. At Macassar, in Celebes, loud explosions attracted the notice of everybody. Two steamers were hastily sent out to find what was the matter. The sounds had traveled from the Straits of Sunda, a distance of 969 miles. But mere hundreds of miles will not suffice to illustrate the extraordinary distance to which the greatest noise that ever was heard was able to penetrate. The figures have to be expressed in thousands. This seems almost incredible, but it is certainly true. In the Victoria Plains, in West Australia, the shepherds were startled by noises like heavy cannonading. It was some time afterward before they learned that their tranquility had been disturbed by the grand events then proceeding at Krakatoa, 1,700 miles away.—Sir Robert S. Ball, in the Youth's Companion.

It must have taken over two hours for the sound to travel that distance.

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**A NEW FUEL COMPOUND.**

The Northwestern Land and Coal Company was incorporated at Portland, Me., in 1888, to manufacture and sell a patented fuel compound known as "394."

It was prominently brought before the mining convention of the State of Wyoming, held at Cheyenne in 1891, and endorsed by that body. Up to the present time the field of operations has been largely confined to the West. Now that the matter of economy in fuel has become such an important factor in the profitable operation of electric light and power stations, the company propose to introduce it thoroughly in that field.

The compound is fully covered by United States patents. "394" is a chemical compound manufactured in both dry and liquid form, and when used in connection with any ordinary coal is claimed to have caused economy of fuel and increased boiler capacity. It is stated that it has received the endorsement of electric lighting and power plants, water companies and manufacturing establishments throughout the country, and has been tested and approved by Prof. R. C. Carpenter, of Cornell University. The company are now in a position to furnish it in any quantities.—Electrical Review.

This compound is advertised very liberally in this journal, and is therefore meeting with ready and large sales in Canada. The Canadian factory is in Montreal, the Toronto office being at 36 King street west.

**WHY IRON IS FIBROUS.**

A writer in the Industrial World taken to task for asserting that iron is fibrous, was asked by The Engineer to give a reason for the existence of fibre in iron, its beginning and its end. We print his reply: It has often been said that a Yankee answers a question by asking another, and yet, though I ask a question, it is not to answer one, but to show how much easier it is to ask than to answer a question. The Engineer might truly assert that there is fibre in wood, and I could not deny it. I might ask him for a reason for the existence of fibre in wood, its beginning and its end. To answer it might give him some trouble. Again, it might be asked, why does the hammering of cold iron split it lengthwise and not sidewise, if there is no fibre in it. If he admits that "sugar is sweet," some one might ask, whence its sweetness, its beginning

and its end? If he is a chemist, he could give the symbols of its constituent parts, etc. However, this is all hy-phly and not a square answer.

When pig iron comes from the puddling furnace, all of the carbon is supposed to have been eliminated, but, in most cases, a trace still remains, which causes it to harden somewhat, when suddenly cooled; and also gives it an uneven structure, the carbon not being distributed uniformly. The fibre is produced in rolling by elongating, the molecules being drawn in one direction as the bar is held on all sides and allowed to increase in only one direction—lengthwise. There is always some slight difference in the chemical make-up of contiguous molecules, so that the slipping of the particles on each other in rolling gives them the fibre nature.

In many cases, when iron bars are broken, a part of the fracture will show a crystalline, and other parts a fibrous surface. For some reason, cast steel always maintains its crystalline nature, and is without fibre, breaking as well in one direction as another. Sulphur causes iron to be "hot short," breaking easily when hot. Phosphorus makes it "cold short," so that heat changes the nature or chemical qualities of iron, as was illustrated in a former letter by the writer, where a lot of wire had been pickled, after being rolled in sulphuric acid and not thoroughly washed in lime water and heated, was very brittle (crystalline), but which, after being heated to 300 degrees, was restored to a tough, stringy (fibrous) condition, incredible as it may and does seem. When it was said by the manufacturers that the brittleness was caused by the action of the acid, and that so little heat only was required to restore it, the idea was scouted, but, when the remedy was tried which resulted in a cure, skeptics were compelled to change their tune. Perhaps some one can explain the why and wherefore in this case, but the writer only knows of the facts as given, and is unable to explain. Again, as to the effects of heat on iron, we know that when "white cast iron" has been roasted a certain length of time, its structure is changed from a very hard, brittle, crystalline one, to a soft, tough and fibrous nature, i.e., malleable iron—due to the extraction of an excess of carbon; but how comes it to have a fibrous structure? "Hot short" iron has a fibrous character when cold, but when heated it changes to a very brittle one, losing its former character. Why? And why does silica cause foundry iron to make soft castings? We all know of a great many facts which we can not give any sort of a reason for.

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## CHEAPENING IN STEEL PRODUCTION.

An announcement has been made at Pittsburgh within a few days which possesses great commercial and scientific importance, and renders possible a serious revolution in the steel industry.

Nearly all of the steel of commerce except that used for tools and ordinance is now made by either the Bessemer or "open hearth" process. In both iron is employed which has already undergone at least one refining operation in a furnace since leaving the mine. The "charge" put into a Bessemer "converter" consists entirely of pig iron, selected with special reference to the amount and nature of the impurities therein, and costing about \$12 a ton at present. When the metal is treated by the open hearth process a different quantity of pig, costing \$1 a ton less, may be used for a portion of the charge, say 75 per cent., and the remainder consists of "scrap," which is a trifle cheaper. The proportions are varied considerably by different makers, the quality of the material and the use to which the product is to be devoted being kept in mind. As the flame in a reverberatory furnace tends to burn out some of the carbon already in the metal, a modification of the open hearth system, known as the Martin process, has been widely adopted. This provides for a bath of melted cast iron, abounding in carbon, into which the rest of the charge is added piecemeal as rapidly as is practicable without chilling the bath.

Another form of iron known as "sponge," and in some respects superior to pig, may, however, be substituted for the latter in this industry if it can only be produced cheaply enough. Sponge iron is ore from which the oxygen has been removed by association with carbon, solid or gaseous, under a degree of heat considerably lower than that required for smelting, and its superiority is due to the fact that whatever impurity is left in it is held in the mass of porous metallic iron mechanically, and not chemically. Experts have long looked upon sponge iron as promising great things for the steel industry, but until recently it has never been possible to obtain it cheaply. Usually the ore was treated with solid coal. Hydrocarbon gases would also do the work effectively, but only on a small scale. Within a few years, however, Charles Adams of St. Louis has developed a plan for thoroughly "reducing" the ore in large quantities with gas, and the system has been so perfected that it is possible thereby to make sponge iron, wholesale, for \$4.50 or less per ton. Further inventions by Thomas S. Blair, Jr., of Pitts-

burgh, render the sponge still more available for the open hearth treatment. These relate mainly to a form of hearth adapted to a freer use of lime with iron abounding in silica.

In making sponge by Mr. Adams' method a current of gas at red heat is passed through the ore and in much less time than is required to produce pig the iron is deoxidized perfectly. By instant removal of the mass to the hearth the metal cannot only be used before it has grown cool (thereby imposing less of a tax on the steel-making heat source), but a fresh oxidization is avoided. It is proposed that every furnace have its own reducing plant directly associated with it, therefore. According to Mr. Blair, the cost of reducing the ore to sponge is only 80 cents a ton, and this is fully met by the increased facility with which the conversion into steel is effected on the hearth. With the same amount of labor, fuel and fixed charges, it is alleged that the output of steel in a given time is increased 50 per cent.

For a time it was believed possible to use sponge exclusively for stock in the Adams-Blair process, but at present a little pig is considered necessary. In production on a large scale, say 1,000 tons of ingots per day, the cost per ton is estimated as follows:—Three-fourths of a ton of sponge, \$3.38; one-fourth of a ton of non-Bessemer pig, \$2.75; waste amounting to 12½ per cent., 77 cents; conversion, \$5; total, \$11.90. By the Bessemer process the stock would cost \$12 a ton, to which \$1.50 for waste and \$5 for conversion would have to be added, giving a total of \$18.50 per ton of ingots. "Conversion" is a term here used to include the coal and labor, use of plant, office rent, and interest. It is generally conceded that the cost of conversion by the open hearth and Bessemer process is virtually the same. Thus it now seems possible that steel can be made for \$6.60 less a ton than formerly, although a royalty of \$2 a ton may be exacted by the patentees of the new method for a time. Not only will the product of the Adams-Blair system be cheaper, but it may also prove better in quality; for as, already indicated, the phosphorus and silicon are in merely mechanical combination with the metal in the sponge, and are eliminated by the use of lime in the furnace as slag.

Within the last three or four years experiments have been made at several furnaces in Pittsburgh, Indianapolis, and elsewhere with this process, and over 2,000 tons of ingots have thus far been turned out. Experts who have looked into the several operations and the product express confidence in the new scheme, and steps

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are now being taken to persuade capitalists to utilize it commercially.—New York Tribune.

LATEST IN ANILINE COLORS.

**Melantherine B.**—This is a new black for cotton being introduced by the Dominion Dyewood & Chemical Co., and is specially suited for hosiery manufacturers. A full dip black is produced that is quite fast to washing and light. The color is simply dyed with salt and afterwards diazotised with nitrate of soda and developed with a chemical combination known as "Developer M."

**Sulfon Brown R. and Sulfon Dark Brown.**—These new browns are suited for wool dyeing only, and although not quite as fast as the alizarine colors, are much faster than the ordinary aniline browns, and will stand light very well and are quite fast to soap. They are specially suited for blanket borders, where subdued shades of browns are required.

**Milling Red.**—This new red has just been placed on the market by the Dominion Dyewood & Chemical Co., and fills a long felt want, for the dyer who has had to resort to cochineal reds for a shade of scarlet that will stand fulling. **Milling Red** is dyed in one bath with the aid of common salt.

**New Fast Blues F. and H.**—Which are manufactured only by the Farbenfabriken of Elberfeld, and which have recently been placed on the market, produce without doubt, the fastest shades against light of any aniline blue dyestuff yet known. They are colored on a tannin mordant and produce shades of an indigo cast. For dyed patterns, etc., address the Dominion Dyewood & Chemical Co.

**Acid Violet 10.B.**—This new aniline is similar to other acid violets with exception that the shades produced are much faster to light and soap and of a clearer tone, and is specially suited where a one-dip color is required and which will stand a fair amount of fulling.

**Sulfon Cyanine G.**—This new color dyes wool a fast shade of blue, one bath similar to the old fashioned Prussian blue. For dyed patterns and further information address the Dominion Dyewood & Chemical Co., who control the color for Canada.

A NEW IRON PROCESS.

Two men of the Jefferson Iron Works, Steubenville, O., have invented a process by which scrap steel can be heated and rolled into shape. Col. A. S. Harden and Thomas Woods are the patentees of the composition used in the new process, which will practically revolutionize the steel business as far as the scrap portion is concerned. Thousands of dollars have been going to waste in scrap steel, which could not be placed in the converter and remelted for re-rolling, as it would be burned.

Six months ago there were 500 or 600 tons of scrap steel at the Jefferson Iron works, which has been worked up and made into steel sheets again by this process. This big pile of scrap set Messrs. Harden and Woods to thinking of a way by which it could be welded together. After much work and many failures, they finally perfected a mineral composition, which, with certain chemicals, when mixed with the scrap, enables it to be heated, rolled and welded without melting. They were successful beyond their greatest anticipations. Their manner of procedure is to lay a bottom piece, then cross pieces of scrap in layers, then the composition is applied, laying on that a top piece, all of which they strap together with iron, making a bundle 2 1/2 inches thick, all of which is heated and rolled into any shape desired. Their composition and process is perfected, and is a revelation to iron men who are not acquainted with the ingredients of the valuable composition.

Messrs. Harden and Woods made a trip to the LaBelle mills, and while there made several trials with scrap, and they have samples of the iron in the office of Col. Harden, in the Jefferson Iron Works building, which have been examined by experts, who say they never inspected a more perfect piece of plate steel. They claim by this process to be able to weld steel from a 35 carbon down.

Sir Melville Parker, Bart., and Messrs. William McKenzie, President of the Toronto Railway Company, and Alderman J. Enoch Thompson, are projecting an enterprise to utilize the falls of the Credit river, near Toronto, as a source of power to be used for electric purposes. The proposed dam will cause a lake to be formed two miles long. The gentlemen have already secured the adjacent lands.



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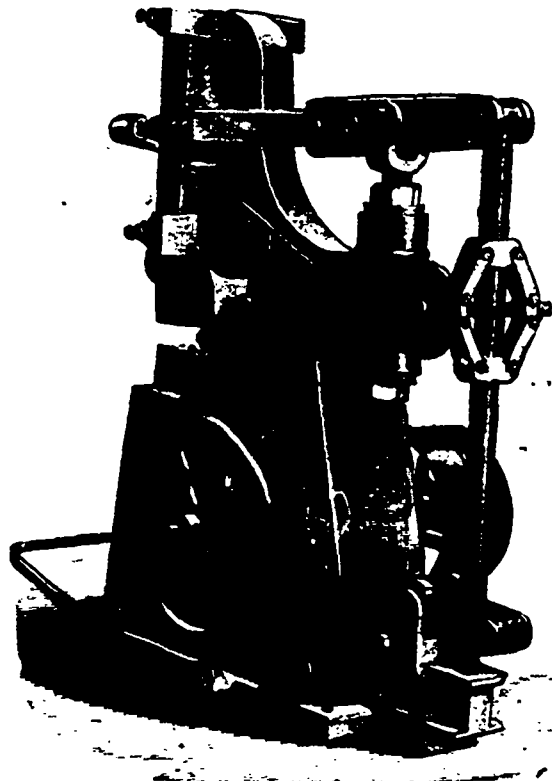
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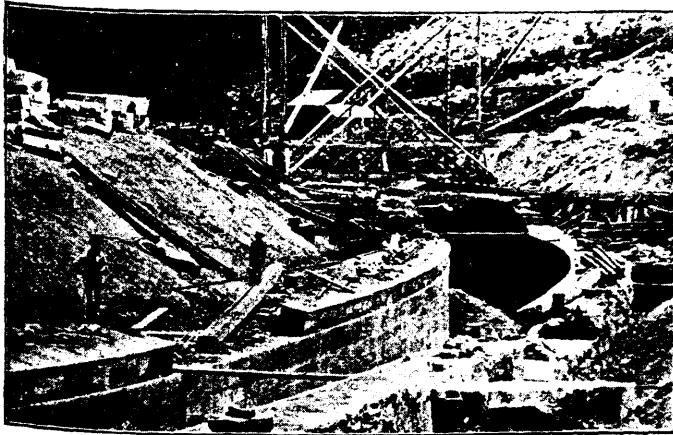
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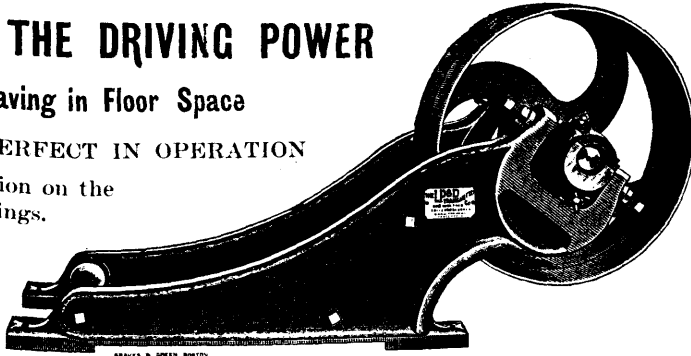
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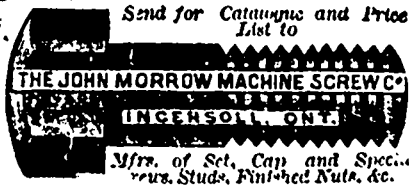
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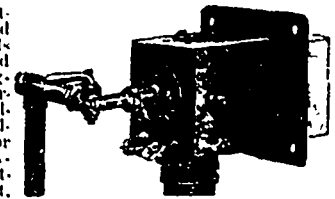
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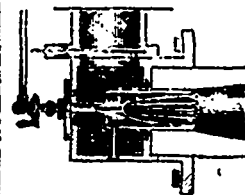
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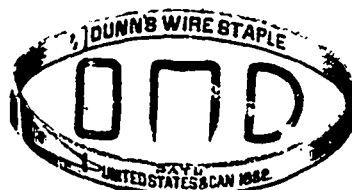
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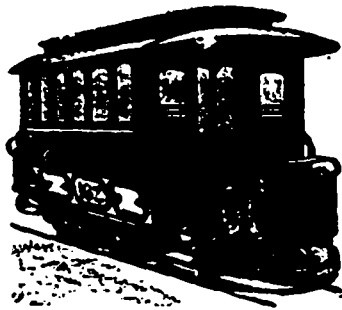
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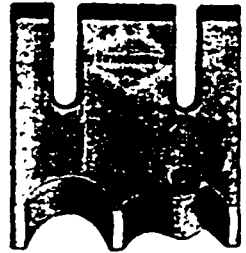
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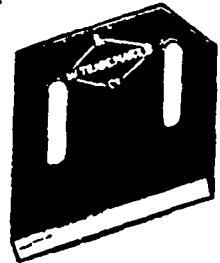
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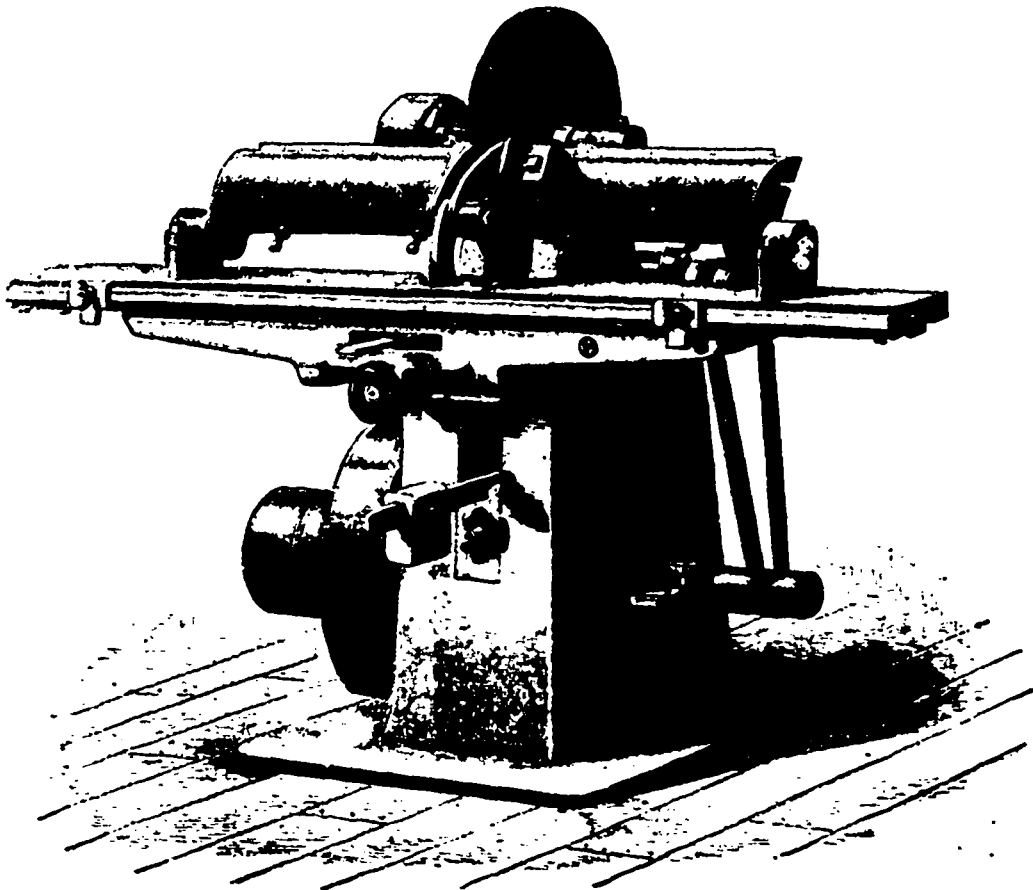
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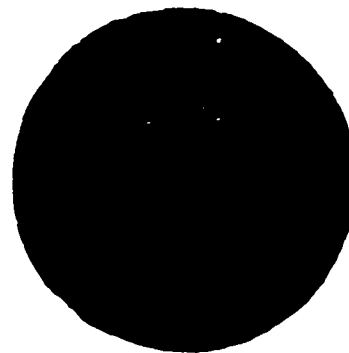
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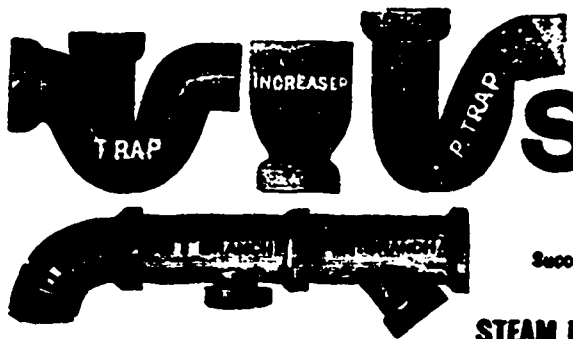
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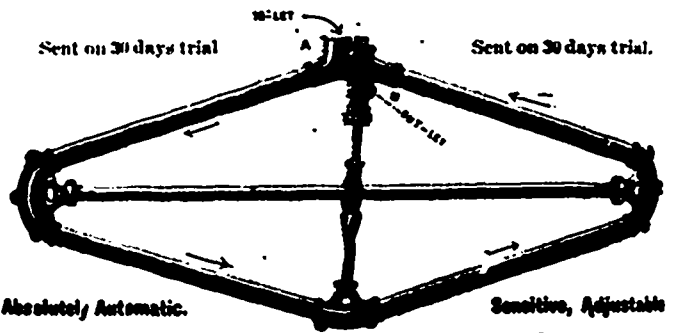
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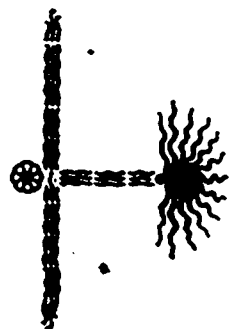
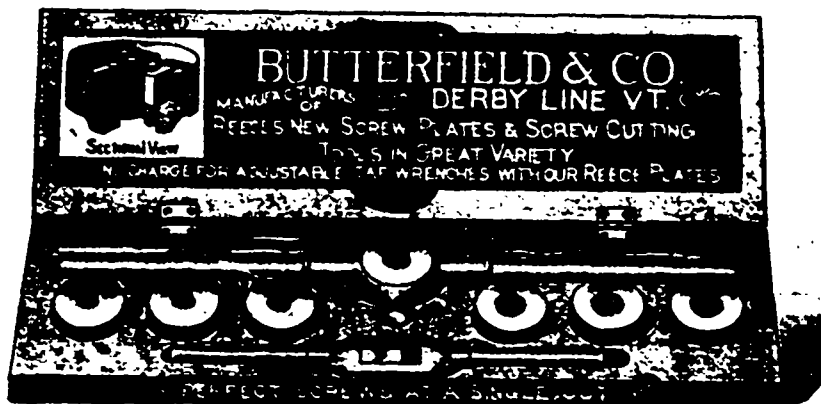
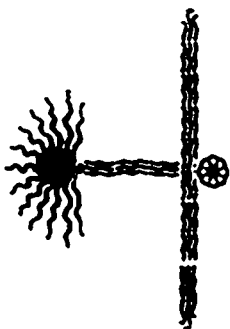
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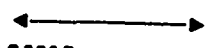
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