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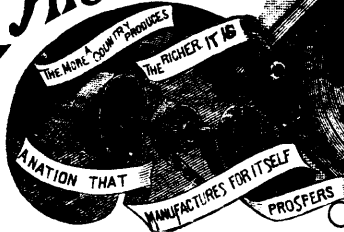
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# CANADIAN MANUFACTURER

AND INDUSTRIAL WORLD

DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION



Vol. 19. TORONTO, OCTOBER 3, 1890. No. 7.

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### AS TO NICKEL.

RECENT experiments made by the naval authorities of the United States at the navy yard at Annapolis, Maryland, demonstrated the fact that what is known as nickel steel is the best material known with which to manufacture armor plates for war vessels. The importance of this discovery cannot be overestimated; for with the use of nickel steel the invulnerability of armor is not only greatly increased, but the weight of the armor is greatly diminished.

This fact having been definitely established, the most important question growing out of it is the supply of nickel. It is said that there are but two known available deposits of nickel in the world from which the metal can be had in commercial quantities. One of these is in New Caledonia, a French penal colony in the South Pacific Ocean, the product of which, either as ore or matte, goes to France for conversion into commercial metal; and the other is in the Sudbury district, in the western part of the Province of Ontario, Canada. The output of the New Caledonia mines is comparatively small, the capacity of the Canadian mines being said to be at least ten times as great. At this time the product of the Sudbury mines is, we understand, the equivalent of about fifteen tons of metal a day; the market value of the article in the United States being about fifty cents per pound.

There is a mine in Pennsylvania, we believe, from which small quantities of nickel are produced, besides which there are said to be no other known deposits in the United States. To encourage this industry the American tariff has heretofore imposed a duty of fifteen cents a pound upon importations of refined nickel, and a similar duty upon the nickel contained in importations of ores or matte. The Sudbury mines, as is well known, are owned by American capitalists, Mr. S. J. Ritchie, of Akron, Ohio, being, we believe, the largest owner. During Mr. Cleveland's administration as President, an effort

was made to reduce the duty on nickel, both the Mills Bill and the Randall Bill placing the duty at ten cents a pound. But neither of these Bills passed, and the duty remained at fifteen cents. An effort was made some months ago to have nickel ore and matte placed on the free list in the McKinley Bill, but the influence of the Pennsylvania nickel mine owners and the prevailing sentiment defeated the move.

The adverse American tariff on the one hand, and the distance from Sudbury to Europe on the other, made it expedient that the Canadian ores should not be carried out of the country, but put through a preliminary process at or near the mines, which resulted in the production of matte, in which condition about all the nickel produced at these mines has been carried to the United States and Europe for refinement.

But immediately upon the report of the naval experiments at Annapolis being made known, and the largely increased importance of nickel being shown, unprecedented haste was made in the United States Congress to rush through an appropriation of a million dollars for the purchase of nickel for the use indicated; while at the same time and with equal celerity nickel ore and nickel matte were placed upon the free list, leaving intact, however, the fifteen cents duty upon the refined metal. The explanation of this haste is that the American Government were apprehensive that the British Government might contract with the owners of the Canadian mine to take all the nickel they could produce. Be the reasons what they may, it is evident the American Government have suddenly discovered the greatly increased value of nickel, that there are no known deposits in their country at all capable of supplying their prospective wants, and that their dependence for the article must necessarily be upon Canadian mines.

Recent legislation in the American Congress shows that no friendly feeling for Canadian interests has actuated American legislators in making their new tariff laws. A duty of five cents a dozen upon Canadian eggs is a specimen of the animus that actuates them; and, to protect a small concern in Pennsylvania, they have insisted upon Canadian nickel paying a duty of fifteen cents a pound. This eleventh hour conversion business of placing nickel ore upon the free list is exceedingly thin, and the spirit that prompts it will be weighed in the light of other transactions.

The duty of the Dominion Government in this matter is clear. Sudbury is in Canada. Under this modification of the American tariff whereby nickel ores are placed on the free list, never a dollar's worth of work will hereafter be done there further than to mine the ores, place them on cars and haul them out of the country. They will not even be reduced to matte in Canada. They will all be hauled away to Ohio and go to build up large and important industries in a foreign country. Canada will be depleted of her wealth, and all she will have to show for it will be a hole in the ground. The United States Government did not fail to impose a heavy duty upon Canadian nickel until it was discovered that they wanted it and must have it; and then they were anxious to get it as cheaply as possible. What the Dominion Government should now do is to place an export duty of say fifteen cents a pound upon all nickel contained in ore or matte carried out of the country. If this eventuated in the establishment of nickel refining works in Canada, well and good; if not, increase the export duty until it did.

## PROTECTION AT THE ANTIPODES.

In another part of this journal will be found a summary of a paper which recently appeared in the London *Fortnightly Review* in which the relative prosperity of Victoria under Protection and New South Wales under Free Trade is contrasted. Our readers will thank us, we are sure, for reproducing this article, bearing as it does upon what is probably the most important issue of the day; and confuting, as it does, the arguments of Free Traders that the greatest measure of prosperity of a country can be obtained only under Free Trade.

The writer deals strictly with facts, and he makes use of neither theory nor tirade. The conditions that surround the two countries are substantially the same—they are both British colonies; the countries are contiguous; the people speak the same language; they have the same trade customs, and their forms of Government are similar, if not identical. The dissimilarity observable lies in the fact that at the starting time New South Wales exceeded Victoria in area, in mineral resources, cultivated agricultural territory and in commercial advantages; while now, under Protection, Victoria outranks New South Wales in all things that go to make a nation great and prosperous. For the past twelve years Victoria has tenaciously clung to her policy of Protection; while for a much longer period New South Wales has enjoyed only such advantages as Free Trade could bring to her. The facts given in the magazine articles show most forcibly the advantages to be gained to a country by Protection. The condition of the working people in Victoria is much superior to that of the toilers in New South Wales. In Victoria wages are higher, nearly every artisan has his own freehold, and property has so much increased in value during the last few years that many have sold a portion of their little holding to special advantage, and are still in comfortable and independent circumstances. There are at present 4000 depositors in the Victoria savings banks of the working classes, where only deposits under £200 are received, and every year the number of deposits and the amount of depositors are increasing. The gentleman quoted, in summing up the situation in both colonies, states that the protective community is ahead in agriculture, ahead in viticulture, ahead in growth of population, ahead in railway development, ahead in banking, ahead in large manufactories and in the number of workmen employed, ahead in enterprise and capital, and ahead in general prosperity and progress.

Some of the more striking facts stated in making these contrasts are as follows:—

"At the present time England stands alone a Free Trader in a ring of Empires and Republics protected by stringent tariffs."

"While the public indebtedness of Protectionist South Australia is only £19,000,000 [\$90,640,000] that of Free Trade New South Wales is £77,000,000 [\$374,220,000], or four times that amount."

"The total land under tillage in Victoria on the 1st of March, 1888, was 2,576,405 acres, and the total land under tillage in New South Wales, on the 31st of March, 1888, was 1,042,394 acres. While the Victorian farmers are eagerly extending their operations, agriculture is at a very low ebb in New South Wales and is steadily declining year by year. The farmers of New South Wales are crying out for Protection." This hardly looks as if the Protection policy was against the interests of farmers, as some theorists would have us believe.

"The increase in population in Victoria for the six months ending in June, 1888, was nearly double the decrease of population in New South Wales during the same period.

"The little Protectionist colony, with a population of only a million, has machinery and plant worth no less than £31,093,183 [\$151,112,869], its manufactures being almost entirely for home consumption; while the estimated value of the plant and machinery employed in 1886 in the 3,694 manufactories of New South Wales was only £5,801,757 [\$28,196,539]."

"The total mileage of railways in operation up to September, 1888, in New South Wales, was 2,104 miles, only 66 more miles being in construction, a total mileage of 2,170 miles; while the total mileage in operation in Victoria up to June, 1888, three months earlier, was 2,018 miles, no less than 521 miles being in course of construction, or a total of 2,539 miles, 369 miles more of railways than in New South Wales."

## EDUCATING THE PEOPLE.

An avowed Free Trader of Toronto proposes to organize a "Reciprocity League" for the purpose of educating the people of Canada in the ethics of national abnegation. He desires to create a public sentiment so that economic questions affecting trade between Canada and the United States can be discussed free from party bias, and to see the flag of commercial reform unfurled in every city, town and village in both countries. The "education" is to be in the direction of "Free Trade" or "Reciprocity," and is to be done by employing speakers, sending out suitable literature and providing writers who will supply Free Trade editorials to such newspapers throughout the country as may be favorable to Free Trade principles. An appeal is made for money to carry out this programme, as "very little can be done without the sinews of war," and the fact is referred to that "no effectual work was done for the abolition of the Corn Laws in England until the Anti-Corn Law League was formed and the money necessary to carry it on subscribed."

This may be a dishonorable method of conducting a political campaign—the *Empire* seems to think it is—but it is legitimate nevertheless, and one that is resorted to not only in Canada but in other countries also. The *Mail* says the project finds its parallel in the Cobden Club scheme and in the American Iron and Steel Association plan of campaign; and also in what the Canadian Manufacturers' Association did for Protection in Canada. "One of the good points about the project," says the *Mail*, "is that it contemplates a propaganda across the line. The Americans certainly require light on this matter. Their press is silent upon it, and their politicians active only at times."

An exceedingly ridiculous feature about the scheme of this Toronto man is that he supposes that any general discussion can be had before the people regarding either Free Trade or Reciprocity "free from party bias." In the very nature of these questions the advocates and opponents of them range themselves as political parties; and the discussion of them can only be made from political standpoints. In what does politics consist if not in such things? It is legitimate for the advocates of Free Trade to discuss their theories before the people, but it is dishonest in them to attempt to create the impression that such discussion can possibly be made "free from party bias."

This incident of the proposition to create a Reciprocity League in Toronto, and to raise a large sum of money to be

used in influencing coming elections, should be carefully noted by all friends of Protection. Allusion is made to the fact that the Cobden Club, in England, and the American Iron and Steel Association, in the United States, engage in political work. This is true; and there are excellent reasons for believing that there has not been a general election held in the United States for many years, nor in Canada since the inauguration of our National Policy, in which the Cobden Club has not taken an active part. This club is composed of a large number of very wealthy English manufacturers, merchants and ship owners who are ardent supporters of Free Trade, and who seek to extend that policy to all other nations. They are particularly desirous of having Canada and the United States adopt this policy, and their efforts to have them do so extends to the liberal expenditure of money for the purpose of influencing elections. In the United States not only the Iron and Steel Association, but many other organizations exist for the purpose of disseminating their peculiar political views, and for influencing legislation; and this is true of those which work in behalf of both the Republican and the Democratic parties—they all engage in the work of "educating the people."

What are Canadian Protectionists doing in this direction? American Protectionists are so wide awake to their interests that they manage to elect Presidents, maintain majorities in both branches of Congress, and make and enforce tariff laws that give the largest measure of protection to American industrial pursuits. They appreciate the value of Protection, and they are ready and willing to put their hands into their pockets to maintain it. In Canada the advocates of Protection did the same thing to bring about a similar policy; but they should remember that eternal vigilance is the price of Protection as well as of liberty. They have staring them in the face the fact that the enemies of Protection are bestirring themselves to defeat it, and to do this they are raising large sums of money, and organizing a campaign that will bring them success unless counteracting influences are put in motion. Canadian Protectionists must also engage actively in this educational work.

#### "PROTECTION" THE WATCHWORD.

A VERY worthy gentleman of Toronto proposes to raise a hundred thousand dollars or so and organize a Reciprocity League, for the purpose, in part, of teaching the people of the United States their duty regarding the economic questions that affect the trade between that country and this. He wants to create such a healthy public sentiment that the question can be discussed "free from party bias," and he also wants to have this hundred thousand dollars unfurl the flag of "commercial reform" in every city, town and village in the United States. Also in Canada. This is quite an extensive contract this worthy Toronto gentleman proposes. The phrase "healthy public sentiment" is rather vague, and, being vague, it would seem to be impossible to tell just how much of this money will be required to manufacture it, or of what stuff it is to be constructed; and as to the unfurled flag business, as one of them is to be displayed in every city, town and village in the United States, also in Canada, it would appear that these flags must of necessity be very small and inexpensive

affairs, else the portion of the money to be devoted to purchasing them cannot hold out. Our dear Mr. Hallam may be able to pull the wool over his own eyes in making his estimates, but he cannot possibly pull it over the eyes of those from whom he hopes to raise the hundred thousand dollars.

Whatever Mr. Hallam may know about wool-pulling, either literally or metaphorically, he seems to entertain a depreciated opinion of our American friends when he supposes that a hundred thousand dollars is sufficient capital with which to engage in business in the United States in the manufacture of "healthy public sentiment" for gratuitous and promiscuous distribution, and in the manufacture of "commercial reform" flags, also for gratuitous and promiscuous distribution to every city, town and village in that country, also in Canada. The proposed capital of the League is not large enough.

But why should Mr. Hallam desire to go into the educational manufacturing business in the United States? He supposes that our American friends are a race of ignorant and misguided people, who do not know what their true interests are, and that they are living in the densest political darkness. He also supposes that he knows what would be better for them than they themselves know; and that it would be an act of political charity to raise a hundred thousand dollars wherewith to educate them. He also supposes that the people of Canada exist in similar ignorance and darkness; and his scheme is to carry on his educational enterprise in both countries at the same time with the same capital. Just where, how and when he calculates to establish his seminaries and schools he does not tell; and as these are to be conducted in connection with the unfurling of political flags in every city, town and village in both countries, the cost of each of these seats of political learning must of necessity be very small indeed. We are unable to state offhand just how many cities, towns and villages there are in the United States and Canada, therefore we cannot tell just how many flags would be required to be unfurled; but the population of the two countries approximate 60,000,000 souls, and it would not be difficult to calculate the per capita distribution of Mr. Hallam's hundred thousand dollars if it were all devoted to this feature of his scheme.

Mr. Hallam is evidently affected with political strabismus. He thinks he sees cobwebs in the sky, and he wants to sweep them away with his little broom. He is one of those callow reformers who still retains his political diaper, but who thinks he is a Hercules in political strength and a Solomon in political wisdom. He does not comprehend the situation or the size of it. He is too small a plug to fill so large a hole. The American people will probably never know who John Hallam of Toronto, is; and if they are to remain in political darkness until he establishes his political seminaries there, in which they are to be instructed in their economic duties, and if their cities, towns and villages are to remain without the adornment of political flags until he unfurls them, their situation will be sad indeed. Likewise that of Canada.

It seems, however, that the people of the United States, likewise of Canada, understand where their interests lie; and they seem to be fully determined to protect those interests. There are flagstuffs erected in the cities, towns and villages of both countries, and at all the cross-roads, too, and along all the

public highways, from which flags are already unfurled, and these are all inscribed with the watchword of prosperity, "Protection," and this flag will not be lowered or give place to any other bearing any other legend.

Protection is good enough for the United States, likewise Canada.

### LABOR OMNIA VINCIT.

THE phrase that implies that labor conquers all things loses its significance when labor is applied to the accomplishment of a thing that is evidently foolish or wrong. It has been said that faith, like labor, is capable of removing mountains; and it is supposable that labor, like faith, could be made to pluck up a tree and plant it in the depth of the sea; but there are some things that even the energy of labor may not accomplish. It may not accomplish such a thing as it recently set out to do when it went into a strike on the New York Central Railroad. This strike was ordered by the Knights of Labor and was encouraged and supported by the highest officials of that order; and in thus supporting it appeals were made to other labor organizations and to the laboring element generally. There was what was said to be the provocation, the opportunity and the means of carrying it to a successful conclusion. The will and the determination to succeed were certainly present, and no element was lacking except that of justification and righteousness, without which the strikers could not possibly hope to be thrice armed—their quarrel was not just. The entering upon this strike was clearly a determination on the part of the Knights of Labor to cross swords with and test the enduring qualities of capital represented by the railroad company. If the strike should prove successful its success would prove that hereafter capital could have no voice in the management of any business in which it might be invested; and that such management should be entirely and always in the hands of those whom it might employ. If it should prove a failure—but in the vocabulary that the Knights of Labor were using at the time there was no such word as fail. They went in to win. They were impressed with the idea that labor conquers all things, and that this organization of labor could and would conquer the New York Central Railroad Company. In this they made a mistake. If they had been successful the strikers would have believed themselves heroes and benefactors—being unsuccessful they have proved themselves exceedingly foolish.

Mr Powderly has issued a manifesto regarding this strike in which he charges that the unsympathetic newspapers and the lavish use of money were the chief causes of the failure. It was clearly evident, he says, that after the first week of the strike the strikers would be beaten; to give in the first week would have shown cowardice, and he felicitates himself and his order that the railroad company lost nearly \$20,000,000 by the event. He declares that the strike was planned and precipitated by the railroad people, and that he has nothing to regret in connection with it.

These are queer assertions for the head of the order of the Knights of Labor to make. From the first it was evident the strike could not be successful. Yet in the face of the inevitable result Mr. Powderly continued the losing game when he knew that every day of its prolongation but increased the

poignancy of the disaster. If it would have been cowardice to have abandoned the contest in the first week, how much greater the cowardice to continue it for fear of being considered cowards. And what a small soul is his to gloat over the fact that the railroad company lost \$20,000,000. This amount is probably largely over-stated, but whatever the loss really was it was as clear a loss as though the amount had been sunk in the sea. If the strike was really planned and precipitated by the railroad people, it shows that they were shrewd enough to anticipate a movement that Mr. Powderly himself intended to precipitate at a later day when immeasurably more damage would have been done; for the fact has been brought out that it was Mr. Powderley's scheme to bring on a general railroad strike during the next presidential election campaign and when most of the railroads of the country would have been exceedingly busy with the traffic growing out of the Chicago Columbian exhibition. If it was heartlessness for the railroad people to bring on a strike in 1890 it would have been criminal for Mr. Powderly to do the same thing in 1892. When Mr. Powderly declares that he has nothing to regret in connection with the strike, he advertises himself as being the embodiment and personification of cold-hearted selfishness, and entirely devoid of any sympathetic emotions.

It may do for this heartless man to make light of this strike, but there are thousands of those who will never forget it or forgive him. We allude to the strikers themselves. These men were satisfied as they were. They were earning their living, and their situations were assured them. To-day they are out of employment, and not only themselves but their wives and children, many of them, are houseless and homeless, and are cold and hungry. They were ordered to go out on strike unnecessarily, and they were kept on strike when failure was inevitable; and the worst enemies these men had were not the railroad people but their own chosen leaders in the Knights of Labor to whom they have to yield unhesitating obedience.

### AMERICAN SHIPBUILDING.

THE July supplement to *Lloyd's Register* shows that during that month fourteen vessels, with an aggregate tonnage of 15,668 tons, were launched from shipyards on the American lakes; and that during the same month twenty-three vessels, with an aggregate tonnage of 16,765 tons, were launched from shipyards on the Clyde. Regarding these facts the Cleveland, O., *Marine Review* says that the lake statistics do not include a 2,000-ton steamer launched from a Canadian lake shipyard, which would make the output of all lake shipyards for that month 17,668 tons, nearly a thousand tons more than the output of the Clyde, and, in comparing numbers, it is seen that the lakes produced the larger vessels. During July the new orders on the Clyde aggregated about 8,000 tons, while on the lakes the orders aggregated 18,000 tons.

Recently published statistics show that in 1888 the shipbuilding production of the world aggregated 765 vessels and 926,523 tons, which in 1889 was increased to 1,090 vessels and 1,572,629 tons. The distribution of this was—in 1888—to the United Kingdom, 484 vessels and 776,993 tons, and to the United States seventy-three vessels and 38,198 tons;



against, in the following year, to the United Kingdom, 656 vessels and 1,180,349 tons, and to the United States 115 vessels and 84,832 tons. These statistics have reference only to the vessels employed in foreign trade, for they do not include the lake tonnage built by the United States, which, in 1888 included fifty-nine vessels and 100,950 tons, and in 1889 fifty-six vessels and 124,750 tons. If this production were added to that shown in the statistics as applying to the United States, the industry of that country would stand next that of the United Kingdom, and almost double that of Germany.

No doubt that shipbuilding section of the United States embraced in the great lakes already leads any other shipbuilding section of any other nation in the production of vessels; and when it is remembered that these vessels are employed wholly in the internal trade of that country, in which no foreign vessel may engage, the policy of the United States in thus excluding all foreign vessels is manifest. Protection is fast making that country the greatest maritime country of the world—greatest in point of tonnage—seeing that it is now ahead of all other nations except Great Britain, whom she is now pushing very closely.

#### THE IRON AND STEEL INSTITUTE.

On invitation of the American Institute of Mining Engineers and others, the British Iron and Steel Institute, whose members represent the metallurgical interests of the United Kingdom, held their annual meeting in New York City, on Wednesday, October 1st, it being expected that the meeting would be continued for three days. Meetings of this Institute have heretofore been held in France, Germany and Austria. The Institute was first organized rather more than twenty years ago, its object being to add to and encourage a scientific knowledge of the production of iron and steel. Other meetings than that at New York will be held in Philadelphia, Pittsburg, Chicago and other American cities. Leaving Chicago the convention will divide, one part going to Alabama, Kentucky, Virginia and Tennessee, the other to the American iron and copper mines on Lake Superior; and on their eastward trip from there a visit will probably be made to the copper and nickel mines of the Sudbury district, Ontario. The visitors will be accompanied by escorts of American gentlemen interested in metallurgical works; and it is probable that Toronto will be favored with the presence of these distinguished men.

In 1864 Mr. Swank, of the American Iron and Steel Association, published in the *Bulletin* the following article regarding the British iron industry and how it was built up by British inventive genius, which all this time cannot but be interesting to our readers:—

The eighteenth century marked a new era in all those branches of manufacturing industry in which the British people have become prominent. It was the era of machinery, which then began to receive general attention as a substitute for hand labor. This era gave to the people of Great Britain the manufacture of India cotton goods, and it largely increased their woolen industry and also wonderfully developed their iron industry. It was in the eighteenth century that Great Britain became the first manufacturing nation in the world in consequence of her quick appreciation of the value of labor-

saving machinery; in the preceding century four-fifths of all British workmen were still farmers or farm laborers.

During the latter part of the eighteenth century and the whole of the nineteenth century down to the present time no other country has occupied so conspicuous a position in the manufacture of iron and steel as Great Britain. Spain and Germany had both been more prominent in the production of these essentials of modern civilization, but Great Britain spurned all opposition when she began to make pig iron in 1735 with the aid of mineral fuel and powerful blowing engines. She had iron ores and coal in abundance, and her people had applied to the utilization of these products their invincible energy and their newly developed inventive genius. Thenceforward the lack of timber for charcoal, which had previously almost destroyed her once flourishing iron industry, was no longer lamented and was but little felt. She was afterwards the first nation to refine pig iron in puddling furnaces and to make bar iron in rolling mills. France, Germany and other Continental countries might have substituted mineral coal for charcoal, invented the puddling furnace, or perfected the rolling mill and the steam engine, but none of them did.

The whole world is greatly indebted to England and Scotland for the inventions which gave a fresh impetus to the manufacture of iron in the eighteenth century. Payne and Hanbury, who first succeeded in rolling sheet iron; Darby, who first successfully and continuously used coke in the blast furnace; Huntsman, who invented the process of making steel in crucibles; Smeaton who invented cast-iron blowing cylinders; and Cort, who invented grooved rolls and the puddling furnace, were Englishmen; while Watt, who perfected the steam engine, was a Scotchman. It is also indebted to the same countries for most of the inventions of the present century which have further developed the manufacture of iron and increased the demand for it, and which have almost created the manufacture of steel. Stephenson, the Englishman, improved the locomotive in 1815, and in 1825 the first passenger railroad in the world was opened in England, his locomotive hauling the trains. The railroad is the greatest of all the consumers of iron and steel. Neilson, the Scotchman, invented the hot-blast in 1828; Crane, the Englishman, applied it to the manufacture of pig iron with anthracite coal in 1837; Nasmyth, the Scotchman, invented the steam hammer in 1838 and the pile driver in 1843; and Bessemer, the Englishman, invented in 1855 the process which bears his name and is the flower of all metallurgical achievements—a share in the honor of this invention, however, being fairly due to the co-operating genius of Robert F. Mushet, also an Englishman, but born of Scotch parentage. The Siemens regenerative gas furnace, which has been so extensively used in the manufacture of iron and steel, is also an English invention, although the inventors, Sir William and Frederick Siemens, while citizens of England, were natives of Hanover, in Germany.

It is only just to add that Sir Henry Bessemer, although born in England, is the son of a French refugee who settled in England during the French Revolution of 1789, and that Benjamin Huntsman, the inventor of the process for manufacturing cast steel in crucibles, was the son of German parents, although himself born in England. Mr. Goran F. Goransson, of Sandviken, Sweden, also assisted to perfect to Bessemer process. It was, however, enterprising and sturdy England which nursed the genius of the great inventors we have mentioned who were of Continental birth or extraction, and it was in England that the ripe fruits of their inventions were first abundantly gathered.

That Great Britain at the beginning of her manufacturing activity did not seek to extend the influence of her new light and life to other countries, but by various acts of Parliament sought to prevent the introduction of her inventions and the immigration of her skilled artisans into those countries, is not here a subject of comment; nor is the strict adherence of Great Britain to a policy of protection to home industries by customs

duties during five centuries and down to almost the middle of the present century a subject of present comment. Both measures undoubtedly fostered the growth of British manufacturing industries, and in the end the world was benefited by British inventions which found their way across the English channel and the Atlantic ocean, and by the example of British energy and British enterprise in the utilization of native manufacturing resources.

The United States is to-day a recognized and formidable rival of Great Britain in the manufacture of all forms of iron and steel, partly because we have abundant native resources for their production, and partly because we are of the same blood as the British people and their German ancestors, but chiefly because we have adopted and in many instances have improved upon her invaluable engineering and metallurgical inventions, the most important of which have been briefly summarized in this chapter.

CANADIAN BESSEMER ORE.

THE CANADIAN MANUFACTURER reiterates the assertion to which attention has heretofore been called in the *Record*, that Canadian Bessemer ore can be laid down in Cleveland, duty paid, for \$3.90 per ton. If this be true, it is hard to understand why this ore is not carried to Cleveland and other lake ports and sold. Good Bessemer ores bring \$5 to \$7 per ton on the Cleveland docks.—*Philadelphia Record*.

Canadian Bessemer ore was laid down at Cleveland in comparatively small quantities for two or three years, but it was found to contain so much sulphur as to make its use in the furnace impracticable.—*Cleveland Iron Trade Review*.

Iron ores abound in many parts of Canada, and no doubt some of these contain sulphur, and that in some instances this substance exists to such extent as to make the use of the ore impracticable for the manufacture of Bessemer iron. Such ores abound in the United States also; but this fact affords no argument against the use of other ores for making Bessemer iron where sulphur is present only in inconsiderable quantities. The *Iron Trade Review* is correct, we believe, in stating that some Canadian ores had been sent to Cleveland, but that the sulphur contained in them rendered their extensive use for making Bessemer iron impracticable; but it is not fair in our contemporary to denounce all Canadian ores as being of that description, when those to which it alludes all came from one mine. We have good authority for stating that there are many deposits of ore in Canada that are quite as desirable for making Bessemer iron, and quite as free from sulphur as any in the Lake Superior region.

This journal has frequently alluded to the fact that a certain good Canadian Bessemer ore could be laid down in Cleveland, duty paid, at \$3.90 per ton. The following analyses have been made of this ore; and the names of the gentlemen who made them will be a guarantee of their correctness:

No.	Analysis made by.	Metallic Iron.	Phosphorous.	Silica.
1	Prof. E. C. Chapman, Toronto.	64.26	Faint trace	—
2	Chemist Soranton Steel Co.	65.36	0.002	4.5
3	Chemist Joliet Steel Co.	66.29	0.024	3.19
4	Prof. Davenport Fisher, Milwaukee.	68.88	0.006	3.18
5	Chemist Cambria Iron Co.	68.85	0.008	1.96
6	Chemist Cambria Iron Co.	69.99	0.012	—

Sulphur, slight traces.

Prof. Thomas Heys, of Toronto, computes that this ore bed contains at least one million tons of ore within one hundred feet of the surface.

EDITORIAL NOTES.

ABOLISH tax exemptions.

CANADA has the call on nickel.

SHOW no favoritism, but tax all property alike.

“At the present time England stands alone a Free Trader in a ring of Empires and Republics protected by stringent tariffs.”

THE net profits accruing to the Toronto Industrial Exhibition Association from their Fair this year amounted to about \$15,000, against \$8,000 last year.

PLACE an export duty of fifteen cents a pound on the nickel contained in Canadian ores taken out of the country and let the American steel clad navy pay the difference.

“WHILE the public indebtedness of Protectionist South Australia is only £19,000,000 [\$90,640,000] that of Free Trade New South Wales is £77,000,000 [\$374,220,000] or four times that amount.”

A REPORT from Chemnitz, Germany, says the McKinley bill has killed the glove industry in that place. It also says the workmen are violent against America. They will probably show their violence against the country by emigrating there to enjoy the benefits of its protective policy.

“THE little Protectionist colony of Victoria, with a population of only a million, has machinery and plant worth no less than £31,093,183 [\$151,112,868], its manufactures being almost entirely for home consumption; while the estimated value of the plant and machinery employed in 1886 in the 3,694 manufacturing factories of New South Wales was only £5,801,757 [\$28,196,539].”

THE assessed value of taxable property in the city of Toronto this year, as just made known by the assessors, is \$148,135,848 against \$137,230,778 last year, an increase of \$12,905,070. The property exempt from taxation is valued at \$21,281,368 against \$18,922,458 last year, an increase of \$2,368,910. The assessors give the population of the city as 167,439 against 160,141 last year.

THE manufacture of cotton goods in Canada is an industry of comparatively recent origin. The first cotton mill was established here about fifteen years ago. The industry has increased quite rapidly, and especially during the past five years, the number of operatives having increased eighty per cent. in that time. The factories now produce about 158,000,000 yards of goods a year.

“THE total mileage of railways in operation up to September, 1888, in New South Wales, was 2,104 miles, only 66 more miles being in construction, a total mileage of 2,170 miles; while the total mileage in operation in Victoria up to June,

1888, three months earlier, was 2,018 miles, no less than 521 miles being in course of construction, or a total of 2,539 miles 369 miles more of railways than in New South Wales”

PRESIDENT VAN HORNE, of the Canadian Pacific Railway Company, when visiting the recent Toronto Fair, stated that Ontario, agriculturally, is the equal of any of the States of the American Union, and as to manufactures it stands ahead of any State, not excepting New York and Massachusetts. He said that scarcely a day passes that does not bring applications from Ontario manufacturers for side tracks into their works connecting them with his railroad.

“THE total land under tillage in Victoria on the 1st of March, 1888, was 2,576,405 acres, and the total land under tillage in New South Wales, on the 31st of March, 1888, was 1,042,394 acres. While the Victorian farmers are eagerly extending their operations, agriculture is at a very low ebb in New South Wales and is steadily declining year by year. The farmers of New South Wales are crying out for Protection.” This hardly looks as if the Protection policy was against the interests of farmers, as some theorists would have us believe.

SPEAKING recently of workingwomen and their wages Cardinal Manning said: “I think the time has now come for strenuous and proper efforts to be made to protect the workingwomen, and to secure to them equal fairness in the matter of their hours of work and their wages as the men now obtain.” No man who loves justice will fail to agree with the Cardinal that a woman who performs as much labor as a man, and performs it as well, within the same period of time, should have the wages that are paid to the man.—*The Textile Record*.

TAXES are raised in the city of Toronto upon an assessed valuation of \$148,135,848 on taxable property, and there is \$21,281,368 worth of property exempt from taxation. This shows the aggregate value of property to be \$169,417,208. The population of the city according to the assessor is 167,439. If all property was assessed alike the taxation would be on a valuation of over \$100 per capita, while as it is the taxation is levied and raised on only about \$88 per capita. This is an unwise and unjust imposition upon those who pay taxes.

THE United States Government have suddenly discovered that they have great use for nickel. They also know that they have no deposits of nickel sufficiently large to supply their wants. They also know that the largest and most available deposits of nickel in the world are in Canada. They have suddenly determined to place nickel ores on the free list. they have, however, placed a duty of five cents a dozen on Canadian eggs. Canada should impose an export duty of fifteen cents a pound upon nickel ores taken out of the country.

MR. JOHN JARRETT, United States consul at Birmingham, England, has sent an interesting report to the State Department on “Foreign Food Products in Great Britain.” From Mr. Jarrett’s paper it appears that, while in 1887 the United

States supplied Great Britain with fifty five per cent. of all the wheat imported into the United Kingdom, in 1889 that country supplied only twenty-nine per cent. However, of bacon, hams, lard, beef and canned meats, the United States sends more to the United Kingdom than all other countries together.

THERE is over \$21,000,000 worth of property in the city of Toronto exempt from taxation. This property consists chiefly in churches and church property, and colleges and college property, in which the general taxpayer has no special interest. Churches and colleges are good things to have, but those who want them, and who are benefited by them should certainly pay taxes upon them the same as the poor man has to pay taxes upon his humble cot. Every dollar’s worth of property exempt from taxation but increases the taxation imposed upon those who pay taxes.

AN English poet sends the following to an English newspaper: “Free Trade is but a juggler’s trick to sily “do” your neighbor; the man who talks about cheap bread more often means free labor. In order to extend Free Trade, black niggers must be slaughtered; and ever in Free Trader’s track, with blood the earth is watered. At home the craze of cheapness rules, and, as no mortal man knows better; if you would know what Free Trade is, why, kindly ask the sweater.” “Sweating” is one of the blessings that British workmen enjoy as their share of Free Trade.

THE “reciprocity campaign,” as it is termed, is a movement to so adjust the tariff between the United States and “inferior countries” that they will feel disposed to buy all their manufactured products from us. That the movement is gaining ground is a very pleasing fact to every American.—*Farm Machinery*.

Just so. The American politicians who are running the “reciprocity campaign” undertake to create the impression that all other countries are “inferior” to the United States. Under such an arrangement, should it be carried into effect, Canada would be expected to buy all its manufactured products from the United States, and at the same time devote its energies to the production of raw materials—“natural products” as it were. This may be “a very pleasing fact” to Americans, but as far as Canada is concerned it will not eventuate just yet. No, not just yet.

A COMPARISON of the tables of export from Germany to Great Britain shows that, in spite of the Merchandise Marks Act and other measures, exports from Germany to Great Britain have by no means decreased. It appears that quite a number of articles were shipped in larger quantities to and by way of Great Britain last year than in former years. The experience of the past year has demonstrated that the Merchandise Marks Act of 1887, which has been extended to almost all the British colonies by this time, far from damaging the German export industry, has called the attention of foreign buyers to its capability, which prior to the coming in force of the Act had not been sufficiently appreciated. It appears that goods bearing the inscription “made in Germany” are frequently demanded, and direct relations of German merchants with foreign purchasers have been increased.

THE rapid developments of electrical appliances have had the effect to raise the price on several kinds of metal and especially platinum. This metal has been used quite extensively in the manufacture of jewelry, and is quite expensive at the present time, being quoted at \$14 per ounce. The reason for the advance in price is said to be chiefly owing to the demand for it by electric light concerns, and also the fact that the product is growing less. The amount of platinum used in the manufacture of electrical apparatus is enormous. Each electric light contains about six inches of platinum wire, and if the metal is not pure it will not stand the great heat. As the electric light grows more in favor the demand for platinum is greater, and, unless some substitute can be procured, the chances are that platinum will be indeed a precious metal. Here, then, is an opportunity for some inventive genius to put his art to work at good advantage in finding a substitute for this expensive metal, which promises to go even higher than at present.

WHEN Major McKinley wanted to place sugar upon the free list, Mr. Blaine protested, saying that if the United States desired to extend its trade with Brazil and other sugar producing countries, and was willing to remove the duty on sugar, that fact could be made use of to force those countries to reduce or remove their duties on some American products. He thought it unstatesmanlike to throw away an opportunity that might be made use of to good advantage in extending his country's commerce. In their wisdom the United States Congress have imposed exorbitantly high duties—some of the mprohibitory—upon certain Canadian products. At the same time they have discovered that they have great use for nickel; and they have placed nickel ore on the free list, knowing that they must look to Canada for their supplies. Canada has a right to impose export duties upon nickel ores. This looks like an opportunity to put Mr. Blaine's theory into operation in this direction. Canada has a good thing in her nickel mines. The Canadian Government would do well to consider the matter.

THE *Pall Mall Gazette* in speaking of the Great Eastern, the largest vessel ever built, says: Who would recognize the shattered hull which now lies at low tide high and dry on new ferry shore of the Mersey as the Great Eastern, which, in 1868, was the wonder of the world? Where once was her stern, the rudder post, with the tiller attached to it, towers out of the water like a gaunt skeleton; and lower down the rudder itself can be seen intact. For seventy or eighty feet forward, the bulwarks and sides have disappeared nearly to the keelson, and all that connects this part of the vessel with her amidships section is the keel, and, above it the enormous shaft which, with its casing removed, lies exposed to view. Her bows have also disappeared completely. Of course her masts, her funnels, and her paddle wheels have all gone long ago. Viewed closely by means of a boat, a vivid realization of her immense strength can be formed. Everything is massive and solid, and we are informed that the plates forming both her inner and outer skin—for the Great Eastern was built with a complete outer casting—are as good as when they were originally put in. It is this obvious strength and thoroughness of workmanship and material that makes her demolition all the more pitiful.

RECENTLY in addressing the Cobden Club, in London, Mr. Gladstone said that Free Traders must recognize with great disappointment how much ground had been lost by their doctrine within the last twenty-five years. Militarism, which lay like a vampire over Europe, was responsible for much of the mischief, but not for all, because Free Trade had receded in countries where militarism did not prevail. In the United States and in the British colonies protection was now applied, not only to goods but to persons, as was instanced by the treatment of the Chinese. The great republic had never accepted the doctrines of Free Trade. At one time there had been a kind of qualified progress toward them, but this was being checked and opinion became actually retrogressive; still the growing strength, activity and clearness of conviction of the Free Trade American party gave a favorable promise of ultimate triumph at the polls. On looking over the world the prospects of Free Trade were certainly not encouraging. This state of opinion had emboldened the champions of Protection, long lurking in their holes, to venture out and renew the struggle under the name of fair trade.

THE idea is beginning to dawn upon farmers in the Western States, and probably in the Canadian North-West also, that instead of devoting the greater part of their time and labor to the cultivation of wheat, they should raise a variety of crops. In an address delivered at the Southern Minnesota Fair Association, Hon. W. M. Bushnell, of St. Paul, strongly urged this point upon the attention of farmers. He said that Western farmers should pay more attention to the little things of the farm, and diversify the farming in such a manner as will produce a variety of crops and thus render absolute failure impossible. He contended that this would not only increase the number of the farm products raised by each farmer, but would afford employment to the farmer and farm hands while the larger crops were growing. This idea is an excellent one, and worthy the attention of Canadian farmers. Bad weather, an unfavorable season, or other causes, may lead to a failure of a particular crop, but rarely to a failure of all; hence the importance of cultivating a variety of farm products.—*Montreal Herald*.

We welcome the appearance of this ray of sanity and common sense on the part of the *Herald*. This is the doctrine this journal has always preached; and if Canadian farmers would live up to the suggestion they would be much better off than many of them now are. Diversified farming is an offshoot and consequence of Protection.

IN the year 1887-88 the United States sold to England, Germany, France, Holland, Belgium, Spain and Italy, \$520,000,000 worth of goods, being three-fourths of its total foreign sales. During the same year these seven countries sold abroad \$2,723,000,000 worth of goods, of which only \$264,300,000 worth, or less than one-tenth, was taken by the United States. The latter is now raising its tariff barriers against these countries, and the result will be a decrease in its trade with them. A glance at the above figures will show whether they or it will suffer the more by the restriction.—*Toronto Mail*.

The idea the *Mail* desires to convey is that because of Protection the United States does not do as much business as countries that do not have Protection. But of the seven countries it enumerates, but England, Holland and Belgium have Free Trade, while Germany, France, Spain and Italy all have Protection. Therefore the suggestion is valueless. But

it is ridiculous to suppose that the United States does not produce as much merchandise per capita as either of the countries enumerated—in fact it produces more than any of them; and the fact that the foreign trade of that country is not as large as that of the other nations proves that the consumption at home absorbs the greater portion of all that is made. It will be found that the \$264,300,000 worth of merchandise sold by those countries to the United States in the period named, will probably decrease under the operations of the McKinley tariff, and that American manufacturers will supply the deficiency.

AN American exchange has figured out from official statistics for 1890 in which are included eleven of the leading industries of that country, the progress that has been made in the last decade. These eleven industries, cotton, woolen, chemicals, paper, agricultural implements, flour, lumber, glass, iron, steel and ship building by the census of 1880 had \$1,165,000,000 capital invested in them, and 844,776 hands employed; they paid out in wages \$256,795,000, consumed \$1,197,000,000 worth of raw materials, and showed a gross product of manufactures of the value of \$1,774,000,000. In 1890 they had \$1,784,840,000 capital invested, and 1,274,000 hands employed; they paid out in wages \$320,689,000, consumed \$1,586,000,000 worth of materials, and gave a product of manufactures of the value of \$2,293,779,000. The increase has been in capital invested \$619,740,000, in the number of hands employed 429,224, in the amount of wages paid out \$93,894,000, in the materials consumed \$397,000,000, and in the value of the product turned out of \$519,779,000. There is over fifty per cent. more capital invested in the specified manufactures than there was ten years ago, fifty per cent. more hands employed, over thirty-six per cent. more wages paid out, over thirty per cent. more material consumed, and nearly thirty per cent. greater product.

MR. EDWARD ATKINSON, of Boston, has written an article for a trade paper in which he shows that the United States is the greatest consumer of iron and steel in the world. Owing to the nearness of the ores and coal in parts of the country, as against the long haul or transportation of ores from Spain and Africa to Great Britain, and the increased depth and heat of the coal mines of England, he believes that iron and steel will be made in the United States at as low a cost as in England, notwithstanding the higher wages in the United States. Basing his estimates on careful calculations, he holds that the present world's production of 28,000,000 net tons of pig iron, of which the United States will make during 1890 about 10,000,000 tons, must within the next ten years, or in 1900, be increased to not less than 44,000,000 tons, even at the lowest possible rate of increase, based on the rate of growth that has continued from 1856 up to the present time, while the rate of increase of late years, during which the demand for iron has so broadened, would show that the world will need and must have not less than 56,000,000 tons in 1900. These calculations are based on the normal rate of growth for the last fifty years, and do not take into consideration the possibility and the almost certainty of greatly increased demand by reason of the opening up of Africa and Asia. This enormous increase in the demand for iron and steel will, Mr.

Atkinson claims, require the utmost effort of production at every point where the raw materials can be assembled at reasonable cost, and where furnaces can be operated to advantage either upon the European or North American continent.

THE eagerness with which United States papers that claim to be respectable and whose comments on other subjects show them to be intelligent repeat the outrageous falsehoods of the most contemptible of Canadian sheets is surprising. A Quebec paper, of no influence whatever as an organ of opinion, came out some time ago with an article, in which England was said to be as ready to give up Canada as she was to give up Heligoland. In the same article we are told that the annexation sentiment is making great headway in Canada, and that it is sure to come before long. We may be certain that if ever a movement in favor of annexation begins in Canada, the evidence of its existence will not have to be sought in the columns of the *Quebec Telegraph*. As for the hirelings who, for value received or promised, manufacture annexation sentiment according to the demand, their cock and bull stories only amuse Canadian readers. Our contemporaries across the line may be assured that a great national movement of the kind in question cannot be set afoot by any obscure clique or by the paid agents of a hostile or traitorous press. As for the McKinley tariff, Canadians would be so small-spirited that Great Britain might well wish to let them go their ways if such a *brutum fulmen* frightened them into surrender. Because a certain proportion of our population may be temporarily inconvenienced by the working of a spiteful measure, does Canada lack manhood enough to bear with the disappointment and capacity and energy enough to turn it to ultimate advantage? It was not so in the days when our dependence on Reciprocity was made hopeless through a like unfriendly policy. On the contrary, the withdrawal of the prop was the first real test of the strength of the British Provinces, and before five years the Dominion of Canada was an accomplished fact. The cessation of the treaty was a blessing in disguise, and the day may come when the McKinley tariff will be recalled as the starting-point of a new era of our commercial expansion and national prosperity.—*Dominion Illustrated*.

## SPECIAL ADVERTISEMENTS.

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sive water power in connection with it including the entire power furnished by the river with real estate on both sides of sixteen acres, situate one mile from Main Street of Lowell, a rich farming country surrounding an excellent location for paper mill, furniture factory, woolen mill and the many uses that require power. Also a splendid home and farm of 87½ acres with buildings, fruit, evergreens, etc. For further information call at the premises of JAS. R. BUCHANAN, Lowell, Michigan.

**TO MANUFACTURERS**—The Town of Thorold, Welland County, Ontario, is a splendid site for manufactures of all kinds, and reasonable encouragement will always be given for the settlement of bona fide industries. It is situated on the boundary between the Counties of Lincoln and Welland; population, 3,000; lighted by electricity (public and private circuits); electric street railway connection with the City of St. Catharines, four miles distant; nine miles from Niagara Falls; the New and Old Welland Canals, also the Welland (G.T.R.) and Niagara Central Railways, all run through the town; water power from the canal; bonded debt small; situation, on the brow of the mountain; overlooking Lake Ontario, most picturesque; public health not excelled; five churches; first-class High school, also two Public and one Separate school. Any information desired will be cheerfully given by application to  
JAMES LAWSON, Mayor.

**BRICKMAKING AND BURNING**, T. A. Randall & Co., publishers, Indianapolis, Ind., price, \$2.50. This is a handsomely bound and valuable work, being a practical treatise on brickmaking and burning, and the management and use of different kinds of clays and kilns for burning brick, with a supplement for new beginners in that work, and hints to bricklayers and builders. The author, J. W. Cray, Sr., is a successful brickmaker of many years' experience, and in this book has given in a plain, practical way his views and experiences in all the details of the work. The book is a veritable storehouse of knowledge on the subject, and should find a place in the library of every worker of clay. There is also much in the book of interest to architects and builders.

**RECOLLECTIONS**—by George W. Childs, with portrait of the author. 12mo., cloth, gilt top, \$1.00. J. B. Lippincott Company, publishers, Philadelphia. Mr. Childs has sent us a copy of this book, regarding which the *New York Times* says:—"He attributes his success in life mainly to three qualities—industry, temperance and frugality. These are the virtues Franklin was so fond of giving emphasis to, and it is interesting to find a successful publisher of an age one hundred years later than Franklin's, who has arrived at the same conclusion in the same city. What is of further interest, and what possesses a significance not to be dismissed at once, is the fact that Mr. Childs, like his illustrious predecessor in the publishing business, has preserved his heart unspoiled by wealth and distinction."

*Our Little Ones* for October resembles all our little ones that come to see us regularly once a month. They never fail to put in their appearance; and their coming is always looked for with much interest. Why? Because all newspaper people are interested in some way in the little ones, and always wish to render them as happy as possible. And how better can the happiness of the children be catered to than by placing in their hands such an excellent and entertaining magazine as *Our Little Ones*? It is always brim full of interesting stories suitable for children, and every page and every story has its own beautiful illustration—pictures having reference to what the story is about. The price of it—\$1.50 a year—puts it within the reach of all. Published every month in the year by the Russell Publishing Company, Boston, Mass.

The *New York Ledger* for October 4th is a mine of interesting fact and fiction regarding the South, both the New South and the Old. It leads off with a brilliant character sketch of Henry W. Grady, journalist, orator and patriot, written by Oliver Dyer, in which the effect on the New South of Grady's life-work is luminously explained. A crisp editorial on "The Marvelous Revival of Prosperity in the South" tells its own tale. The Old South is pictured in the opening instalment of a Kentucky war story, entitled

"Reunited," the pen-product of a distinguished Southern officer. In "For Isobel," Maurice Thompson gives a vignette of ante-bellum life in Louisiana. James Parton tells the story of Cæsar Rodney, of Delaware. An illustrated ballad by Thomas Dunn English, and a story by Mrs. Amelia E. Barr, are published in the same number.

**PHYSIOGNOMY AND EXPRESSION**.—By Paolo Mantegazza, Senator; Director of the National Museum of Anthropology, Florence; President of the Italian Society of Anthropology. Two double numbers of "The Humboldt Library," price, 30 cents each. The Humboldt Publishing Co., 28 Lafayette Place, New York. Professor Mantegazza is the leading anthropologist of Italy, and his work has been already translated into several European languages. He has written a new chapter for the present edition, which contains his latest views on the subject, which he has made his own. Taking up the study of expression where it was left by Darwin, Professor Mantegazza has treated the subject in a style that is at once popular and scientific. He has endeavored to distinguish observed facts from mere opinion or imagination, and he has given definiteness and coherence to the many new facts already collected. The ancients, from Cleanthes up, believed that they could recognize dispositions from the looks. Lavater, who was a physician, a naturalist and, above all, an enthusiast, first gave something of a rational form to physiognomy. What the volume proposes is "to restore to anthropology and to psychology that which belongs to it by right, and to make known the positive documents which we possess to-day on the human countenance and on expression."

AFTER the spirited ballad of "Piping Jean," by Caroline D. Swan, which opens the October *Wide Awake*, the reader comes upon a good foot-ball story, a story of Phillips-Exeter Academy, by Mrs. Knight, entitled "John MacGregor's Lesson;" curiously enough, while this story describes a foot-ball game between this school and Phillips Academy at Andover, the chapters of Mr. Ward's serial, "The New Senior at Andover," chronicle a base-ball contest between the same two schools. Mrs. Harriet Prescott Spofford is at her splendid best in the war-story, "One Good Turn." "An Adirondack Camp," by Margaret Sidney, is a breezy chronicle of a particularly jolly time had by some particularly jolly young people. "Jack and Æsop's Jackdaw," by Amos R. Wells, is one of the brightest of the School and Playground series of stories, while "The Scarlet Specter of Sandy Ridge" is perhaps the strongest yet of Miss McLeod's Acadian Old-Folk Lore tales. "Brer Lizard's Coats," by Martha Young, is a quaint bit of story such as Southern negroes like to tell. Alexander Black's "Camera Club" has seven fine photographs by amateurs. "A Quilt Expedition," by Henry Cleveland Wood, brings back to notice an old-time species of sewing-work, and gives twenty-four popular counterpane designs. *Wide Awake* is \$2.40 a year. D. Lothrop Company, publishers, Boston.

NEW ENGLAND proudly recognizes the sovereignty of King Cotton. At Pawtucket the centennial celebrations takes place, and there the record of the past hundred years improvement will be rehearsed. True to New England interests, the *New England Magazine* comes forward to assist in the celebration, by preparing for its October issue a special cotton number, in which may be found the whole story from beginning to end, with portraits of such men as Samuel Slater, Stephen Davol, Tracy Jackson, Oliver Chace, John Slater, Wm. C. Davol, Nathan Appleton, David Anthony, Abbott Lawrence, Moses Brown and others. Pictures are also given of the old and new methods of Carding, Spinning, Weaving and Printing. Every one interested in cotton will want a copy of the October number to read and to keep as an interesting and valuable contribution to cotton literature. Pictures of some of the leading mills are also given, including Pacific Mills, Lawrence; Merrimack Manufacturing Company, Lowell; Amoskoag Mills, Manchester; American Print Works, Fall River; Pomemah Mills, Norwich; Androscoggin Mills, Lewiston; Slater Mills, Pawtucket; Wamsutta Mills, New Bedford; Conant Thread Mills, Pawtucket; Border City Mills, Fall River. There are many other pictures in these articles, of which there is not space to speak in detail, including views of Pawtucket, etc.

THE last issue of the *Dominion Illustrated* is of exceptional interest to all loyal Canadians, as it contains a full account, with copious engravings, of the visit to Montreal of Prince George of Wales. The views of the *Canada* and *Thrush*, and the chief features of their construction and equipment, of the officers and men of the different services (Royal Navy and Marines), of the Prince and his party at the lacrosse match, and the spirited illustrations of the ball at the Windsor, from Patterson's sketches, make up a number of rare pictorial and historical interest. The groups, showing the various occupations and amusements customary aboard a man-of-war, are extremely animated and life-like, while the illustrations of Prince

George's sojourn in Montreal are, we believe, as effective as anything of the kind that Canada has yet produced. The enterprise of the publishers is deserving of recognition. The issue of September 13th contains a full supply of portraits, scenery and illustrations of recent events of interest. The Earl and Countess of Aberdeen, the late Wm. Wilson, the late Judge O'Reilly, H. M. S. *Bellerophon*, *Canada* and *Thrush*, in connection with the visit of Prince George of Wales, some fine military scenes, views of Kincardine, Ont., and the Chaudière, and a collection of the noteworthy members of the civil service—the Ministers' private secretaries. Altogether, in variety and excellence, it is a capital number. The letter-press is of corresponding merit. Address, 73 St. James Street, Montreal.

E. A. HARTSHORN, of Troy, the energetic organizing agent of the American Protective Tariff League, was at the rooms of the league on West Twenty-third Street on Saturday, when mention was made of the opposition of importers to the McKinley Tariff Bill. "Certainly the importers are kicking against it," said Mr. Hartshorn. "It is a protection bill. It operates against European manufacturers, of whom they are the representatives. They only obey their masters. If European manufacturers did not fight the bill there would be something wrong about it. It is not strange that the people of England are manifesting more interest in the bill by far than we are in this country. Why shouldn't they? The markets of the United States are worth more to England in certain lines of business than all the other markets of the world. The linen trade is an example. The more kicking there is by importers against the bill the more uncertainty that the bill will pass. Protection to home industries and free foreign trade will mix no better than fire and water. The kicking indicates that heretofore we have enjoyed protection only in spots, but now it is about to break out all over. The free traders tell us it is a fearful disease, but the queerest thing about the scourge is that it kills the other fellows." —*New York Press*.

THE mineral part of Bilbao, in Spain, is the busiest and most important point in the Iberian peninsula. During last year no less than 2,013 British ships entered the port, and all but eight secured cargoes. Its trade is mostly in iron ore—over 3,000,000 tons being sent out of Bilbao last year. The United Kingdom takes the largest share of this—Middlesborough, Newcastle, Stockton, West Hartlepool and Sunderland being the largest local buyers. Bilbao, naturally enough, is trying to smelt more of its ore at home; and thus it took in 283,000 tons of coal and 182,000 tons of coke—nearly all the coal and all the coke being from the United Kingdom. Let us now look at its production of pig iron, and we find that it shipped about 120,000 tons. Italy is the largest buyer of the Spanish pig iron, and to some extent it has cut out there 31,000 tons of crude iron to Italy. This town of Bilbao, then, with its population of 53,000 persons—doubled in a decade—is fed by the rich deposits of iron near it, and it is creating in and near its borders other industries not named in Consul Young's report. The iron industries of continental Europe are encroaching on the markets of England, though the economic results are indirectly averted by the investment of British capital and its share in the profits.

THE Sault Ste Marie canal during the year ending June 30, 1890, gave passage to 10,108 vessels of which 6,806 were steam vessels propelled by screws and 2,834 were sailing vessels. The following are some of the more important items of the traffic passing through the canal;

Coal, net tons	1,894,433
Copper, net tons	36,687
Flour, barrels	2,592,736
Wheat, bushels	19,459,796
Grain, other than wheat, bushels	2,732,698
Iron ore, net tons	4,404,935
Pig iron and manufactured iron, net tons	72,163
Salt, barrels	207,762
Lumber, feet b. m.	308,032,000
Unclassified freight, net tons	344,425
Number of passengers	24,125
Total registered tonnage	7,899,604
Increase over previous year	1,686,110
Total freight tonnage	8,288,580
Total registered tonnage since opening canal in 1855	56,539,576
Total since opening new lock in 1881	38,549,853

Besides the lumber above reported, nine rafts containing 17,500,000 feet of lumber were passed down the rapids. During the calen-

dar year of 1889 there were transported through the canal 7,516,022 net tons of freight. The average distance over which this freight was carried was 790.4 miles. The total number of mile tons was 5,940,646,352. The total cost of transportation was \$8,634,246. The average cost of carrying one ton one mile was 1½ mills

### BIG PROFIT IN BEET CULTURE.

TEN years ago any statement to the effect that the cultivation of beets for sugar in this country could be made profitable was ridiculed. A few men, however, commenced making experiments with the result that beet sugar factories are in successful operation in various parts of the country, and the industry is growing with remarkable rapidity. The farmers now appreciate the necessity of a rotation of crops, and are planting everything that can be raised at a profit. This to a large extent, accounts for the increasing demand for a diversity of farm implements and machinery. But with all the numerous crops now being planted not one is as important outside of the grains, hay and potatoes, as the sugar beet. When we take into consideration the fact that while we export millions of dollars worth of wheat, we import millions of dollars worth of sugar, this should be patent to all. It is very evident that we can send less wheat abroad and produce more sugar to our advantage and profit. With our lands much cheaper, our farmers should certainly be able to produce beets at a less cost than they are produced in Europe, and as we are protected by tariff and freights our native sugar can unquestionably be sold at a profit. Beets can be grown three successive years on the same land, which is then in grand condition for wheat or oats.

It is most encouraging to note that wherever there is a beet sugar factory in this country the farmers are making money. One Nebraska factory will hereafter require 45,000 tons of beets, which is the estimated product of 5,000 acres, and as the average price paid is something over \$4 a ton this yields the farmers upwards of \$36 for every acre planted in beets. If planted in wheat the yield would have to be thirty-six bushels per acre, and the selling price \$1 per bushel to obtain a gross income equal to that. And it costs less to plant and harvest beets than wheat. There is now a demand for beet-sugar factories in at least fifty different cities or towns, and as each factory can use the product of 5,000 acres, there should be 250,000 acres more in beets next year than this. Competent authorities estimate that this ratio of increase will be maintained until there is 2,000,000 acres devoted to beet culture, the product of which will be worth about \$70,000,000 per annum. This estimate is very moderate, for the 1,500,000 tons of sugar consumed in the United States every year is certainly worth more than \$70,000,000. It is no wonder that this growing industry on our continent is creating consternation among foreign beet-sugar manufacturers. They have been selling us about 330,000 tons of sugar per annum, and to produce our own sugar means their entire loss of this immense trade. That there is nothing chimerical in the hope that in a few years more we will produce enough sugar for home consumption is proven by the present status of our sugar industry. Besides the factory in Nebraska there are factories in Kansas, Louisiana, California and other States, and companies are organizing everywhere to manufacture sugar from beets. Even Idaho will have one or more sugar factories by this time next year, to say nothing of Minnesota and the Dakotas.

The value of this industry cannot be over estimated. It will give the farmers a profitable and certain crop; it will furnish employment in the factories to thousands of workmen; it will call into effect manufactories for making machinery, and it will furnish dealers with a new line of implements to sell. This can be made clearer by a study of the figures presented by the sugar factories at Alvarado, or Watsonville, California. The expense account of the factory at the former place for 1889 was \$105,416. Of this amount \$42,000 was paid directly to farmers for beets; \$28,000 directly for wages and salaries, and the balance was paid for labor in furnishing limestone and fuel and other incidental expenses. At Watsonville last year, 2,000 tons of raw sugar were made out of about 21,000 tons of beets, for which the farmers were paid upwards of \$5.25 per ton, and the yield in that territory was ten tons and even more per acre. The farmers around Watsonville were once glad to clear \$10 per acre on wheat; now they are dissatisfied at a net profit of less than \$30 per acre on sugar beets. It should be kept in mind that these industries are in their infancy. Neither of them have been in operation four years, and their success clearly demonstrates the profit in beet culture. Governor Larabee, of Iowa, in his recent message said that "the prospect for building up a great and lucrative industry that will take off the pressure from the corn, beef and pork markets, produced by over-production, is bright if unceasingly

governors and congressmen keep their hands off, and allow the protection to the West in the matter of sugar raising that has been for so many years generously accorded to Louisiana. The very general interest which has been awakened through all this region of country in regard to the manufacture of beet sugar has rapidly crystallized into a positive conviction that it is to be one of the main industries of the future. The vast supply of corn raised this year has led farmers to appreciate the advisability of diversifying their labors. They now see that beets can be raised at a good profit and will be sold at home instead of their products being subjected to extortionate freight charges and to the uncertainty of the long haul to a distant market. The manufacture of beet sugar is now in its infancy. Parties have already begun to invest largely in plants to build the industry; and if properly encouraged I know of no branch of agricultural labor that will bring more sure results and a greater profit to the farmer than the cultivation of sugar beets. A portion of the acreage now devoted to corn will be applied to the raising of this product."—*Farm Machinery.*

### THE GREAT ST. CLAIR RIVER TUNNEL.

SCIENCE has again been victorious in accomplishing what nature seemed to have forbidden. The St. Clair river with a mighty current divides the United States from Canada and forms a barrier to continuous railway transportation which has hitherto been crossed only by the tedious and costly method of using steam ferry boats. For many years the Grand Trunk Railway Company has desired to close the gap in its great highway between the Atlantic and the west, but through various schemes of bridging and tunneling were discussed they were relinquished on account of natural or commercial objections. The character of the earth underneath the river made the practicability of boring a tunnel in the ordinary method very doubtful, but it was left to Mr. Joseph Hobson, chief engineer of the Great Western Division of the Grand Trunk Railway to propose and to carry out the plan of starting at the surface of the earth and boring downward and thence across with a steel shield having cutting edges and forced through the clay by powerful hydraulic pressure. As fast as the shield cut its way a section of the tunnel consisting of an iron ring, four feet ten inches long and composed of thirteen segments bolted together was put in place and the walls of the tunnel were thus completed without brick or stone as the shield progressed. Meantime the earth from the interior was removed by a force of men and animals and carried to the shore. This process was going on simultaneously from each end and in less than a year the two shields had cut their way through a distance of over 6,000 feet, and one day last week the workmen shook hands from the opposite sides through an opening in the remaining wall of earth and the great undertaking has been proven a practical success. It now remains to cut out the approaches for a distance of more than half a mile on each side and lay the tracks, whereupon the trains of the Grand Trunk Railway can run unbroken from the eastern to the western terminus, passing under the great river through a dry cylinder twenty feet in diameter. To a Canadian railway company therefore, belongs the honor of completing by far the greatest river tunnel in the world and of demonstrating the practicability of a method of tunneling which will probably become general under similar conditions. The possession of an unbroken line across—or under—the international boundary will give the Grand Trunk Railway Company a considerable advantage over its competitors between Canadian and United States points and will doubtless tend to force the Michigan Central and Canadian Pacific Companies to obtain equal facilities by tunneling under or bridging the Detroit river.—*The Railway Age.*

### PROTECTION VS. FREE TRADE IN AUSTRALASIA.

The following is a summary of a paper by Mr. G. H. D. Gossip, which has recently appeared in the *London Fortnightly Review*:

"Opposite fiscal policies have long been pursued in the two chief Australian colonies of Victoria and New South Wales, which are inhabited by the same race, and whose territory is contiguous. The former had adhered steadily for the last twelve years to a rigorous protective policy, while the latter has adopted for a very much longer period the policy of Free Trade. It is, therefore, interesting to compare the progress and prosperity of the two leading colonies of the Antipodes at a time when attention is being more than ever directed to Australia, and to its commercial and political importance, and when the tide of emigration from Great Britain and Germany to the vast Australian Continent is constantly on the increase. "In the case of the two colonies above-named Protection and

Free Trade have now been tested side by side as an economic experiment for many years. With her enormous area, well-nigh four times as large as that of Victoria; with her vast mineral wealth in gold, silver, coal, iron, copper and tin, her corn fields and immense tracts of pastoral land and timber, with a finer climate, a larger seaboard, and the grandest harbor in the world, the natural resources are almost immeasurably greater than those of Victoria. And yet the little Protectionist colony is ahead of the gigantic Free Trade colony in nearly every respect—a striking confirmation of the evidence of a hundred Chambers of Commerce in favor of Protection. At the present time England stands alone a Free Trader in a ring of Empires and Republics protected by stringent tariffs; but her Australian colonies are now compelled to fall in with the fashion by fencing themselves round with fiscal defences. South Australia, which had previously suffered from great depression of trade and financial embarrassment, has recently followed the example of Victoria, her sister colony, and since her adoption of a Protectionist policy there has been such a marked revival of business and increased prosperity that she has now a surplus of £30,000. While the public indebtedness of South Australia is only £19,000,000, that of Free Trade New South Wales is £77,000,000, or four times that amount.

"There is, perhaps, no surer method of gauging the prosperity of a country than by investigating the condition of its agriculture. The increase in land under cultivation in Victoria in 1888 as contrasted with the previous year, according to the 'Australian Handbook' for 1889, was no less than 446,482 acres, while the increase in land under cultivation in New South Wales was only 67,760 acres. The total land under tillage in Victoria on the 1st of March, 1888, was 2,576,405 acres, and the total land under tillage in New South Wales on the 31st March, 1888, was 1,042,394 acres.

"While the Victorian farmers are eagerly extending their operations, agriculture is at a very low ebb in New South Wales, and is steadily declining year by year. The farmers of New South Wales are crying out for Protection. Their Free Trade Government, under Sir Henry Parkes, was indeed forced to a kind of limited Protection in fostering native industry to the extent of granting certain Government contracts to local firms, and in giving a bonus to the ironworkers, in order to propitiate public opinion and allay the clamor against Free Trade.

"The value of buildings, machinery, etc., in Victorian manufactures, with 21,707 horse-power, and employing a far larger number of hands than those of New South Wales, is £12,633,988, and the value of its agricultural machinery is £18,459,195, so that the little Protectionist colony, with a population of only a million, has machinery and plant worth no less than £31,093,183, its manufactures being almost entirely for home consumption, while according to the 'Statesman's Year Book' for last year, the estimated value of the plant and machinery employed in 1886 in the 3,694 manufactures of New South Wales was only £5,801,757.

"The area of Victoria is only 87,884 square miles, or 56,245,760 acres, whereas New South Wales contains an area of no less than 310,938 square miles, or 199,000,320 acres, being about the size of France and Great Britain united. Yet its population, according to the 'Australian Handbook' for 1889, on the 30th of June, 1888, was only 1,063,511, while its estimated population in the previous year, in December, 1887, was 1,078,205, thus showing a decrease in population in six months in the Free Trade colony of 14,694. On the other hand, according to the same reliable authority, the estimated population of the Protectionist colony of Victoria on the 30th of June, 1888, was 1,060,419, while on December 31st, 1887, its estimated population was only 1,036,119, thus showing an increase of population during the same period of six months in the Protectionist colony of 24,300, that is, the increase of population in Victoria for the six months ending in June, 1888, was nearly double the decrease of population in New South Wales during the same period. The statistics are indeed eloquent.

"In order to give some idea of the development of mining in the Free Trade colony, it may be pointed out that up to the end of 1886 the total value of the mineral products of New South Wales was £69,772,187, of which £36,469,138 was gold, £18,352,609 coal, £6,595,102 tin, £4,859,390 copper in ingots, £104,860 ore and regulus, £580,428 silver, and £651,511 silver lead. In 1887 2,922,497 tons of coal, valued at £1,346,440, were also obtained in New South Wales, for New South Wales is the richest of all the Australasian colonies in coal, and its port of Newcastle is the chief coal depot and coaling station of the Antipodes.

"But the superior mineral resources of New South Wales, whose coal area is estimated at 23,950 square miles, and whose cupriferous formations cover 6,713 square miles, proves nothing whatever as to the advantages of Free Trade over Protection, more especially when it is borne in mind that some of the chief mines of New South



Wales are worked by syndicates of Victorian capitalists. Only recently a portion of the Australian Steam Navigation Company's works in Sydney was purchased by a Melbourne firm, and Victorian capitalists are thus able to invest in New South Wales ventures. Most of the proprietary steamship companies, too, are in Melbourne and Adelaide, the two Protectionist capitals, not in Sydney, the Free Trade centre.

"We now come to the important question of railway development. The total mileage of railways in operation up to September, 1888, in New South Wales was 2,104 miles, only 66 more miles being in construction, a total mileage of only 2,170 miles; while the total mileage of railways in operation in Victoria up to June, 1888, three months earlier, was 2,018 miles, no less than 521 miles more being in course of construction, or a total mileage of 2,539 miles, 369 miles more of railways than in New South Wales.

"It may also be pointed out as a proof of the unsatisfactory financial condition of New South Wales that in the short space of four years, namely, from 1882 to 1886, the interest on the public debt of that colony has actually almost doubled itself. In 1881 it was only £719,753, while in 1886 it was £1,579,179. These figures, moreover, are fully confirmed by the 'Australian Handbook' for 1889, which gives the public debt of New South Wales up to the end of 1887 as £40,955,349. Now the public debt of Victoria up to the end of 1887 was only £33,119,164, or £7,836,185 less than that of the Free Trade colony. Where, it may be asked, is there a colony or country which can show such amazing prosperity and progress as Protectionist Victoria?

"The prospects of a man becoming his own master are better in the Protectionist than in the Free Trade colony. There is no class of people more comfortable and contented than the working men of Victoria. Nearly every artisan has his own freehold, and property has so much increased in value during the last few years that many have sold a portion of their little holding to special advantage, and are still in comfortable and independent circumstances. There are at present 4,000 depositors in the Victorian savings banks of the working classes, where only deposits under £200 are received, and every year the number of depositors and the amount of the deposits are increasing.

"Wages also are higher in Victoria than in New South Wales, and the Victorian working man is incomparably better off than his confrere in the Free Trade colony. For, as is well known in Australia, there is great distress in Sydney, where I have often seen mass meetings of thousands of unemployed men, many of whom were unable even to pay for a night's lodging, and had to sleep out on the grass in the domain without any covering. Processions of starving men carrying banners bearing the ominous inscription 'Bread or Work,' were often to be seen in the streets of Sydney some two years ago. Free Trade is doomed in Australia. It has been tried in South Australia as well as in New South Wales, and has been found wanting. New South Wales is the only Free Trade colony in Australia; but it is not likely long to continue as such, considering the suicidal nature of its policy; and, in fact, it has already been compelled to resort to certain Protective measures.

"The iron trade of Victoria is in a most prosperous condition. Factories are rapidly multiplying, and she is supplying most her own wants at first cost, and many of those of Free Trade New South Wales as well, plus the freightage. There are also flourishing steel factories at Fitzroy, a suburb of Melbourne, as well as nail factories in Melbourne itself.

"The total imports and exports of Victoria for 1887 were £30,373,296, those of New South Wales being only £37,303,153. The total exports of New South Wales for that year amounted to £18,496,917, and the total exports of Victoria for the same year to £11,351,145.

"Victoria produces the necessaries of life in the shape of food, clothing, etc., and does not need to import like New South Wales, which imports nearly all it eats and wears. Victoria, under Protection, is advancing steadily, yet rapidly, along the road to prosperity. On the other hand, industry in New South Wales and Sydney is on the decline owing to Free Trade. What Australia perhaps most needs is not Free Trade with Europe and America, but intercolonial Free Trade between its various States, and Protection against the outside world.

"To sum up. The Protective colony is ahead in agriculture, ahead in viticulture, ahead in growth of population, ahead in railway development, ahead in banking, ahead in large manufactories and in the number of workmen employed, ahead in enterprise and capital, ahead in general prosperity and progress; and, finally, although behind in mineral and pastoral wealth, its artisans and peasantry—in a word, its entire proletariat—the bone and sinew of a country, are perhaps the most contented and prosperous in the world."

## Manufacturing.

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

MR. FARQUHAR'S saw mill at Owen Sound, Ont., was destroyed by fire Sept. 24th.

MESSRS. SIMMONS, Burpee, Elkin and Smith have erected a large shingle mill near Vancouver, B.C.

THE Johnston Patent Plowshare Company, of Toronto, has been incorporated with a capital stock of \$100,000.

THE Vermilyea Corset Company of Ontario, of Toronto, has been incorporated with a capital stock of \$40,000.

MR. SAMUEL DODGE, Middleton, N.S., has started a sash and door factory, and will saw dimension stuff, staves, etc.

MR. F. G. McMULLEN'S steam saw mill at Shubenacadie, N.S., was destroyed by fire Sept. 13th, loss about \$12,000.

MR. J. D. ROSS is building a tannery at Kamloops, B.C. The building will be 36x26 feet, and there will be ten vats.

MR. CLAUDE HARTLAND has started a factory at Liverpool, N.S., for the manufacture of sash, door, blinds, mouldings, etc.

MESSRS. LOTHAIR & MOODIE'S planing mill at Sault Ste. Marie, Ont., was destroyed by fire Sept. 12th, loss about \$14,000.

THE Ever Ready Dress Stay Company, of Windsor, Ont., have begun the manufacture of paper underclothing, quilts, etc.

THE Guelph Carriage Top Company, Guelph, Ont., are forwarding a large consignment of carriage tops to Melbourne, Australia.

THE Keegans-Milne Company, of Montreal, will put in an electric lighting plant in the Brunette saw mill, at Westminster, B.C.

MR. ELMER WARD, of Fredericton, N.B., is building a shingle mill at Westminster, B.C., with capacity to cut 30,000 shingles a day.

THE Duplessis Tannery, at St. Etienne, Que., was destroyed by fire, Sept. 3rd, loss about \$12,000 on stock and \$15,000 on buildings.

FIRE in the carriage cloth department of the Toronto Rubber Company's works on Sept. 15th did damage to the extent of about \$5,000.

THE Unser Carpet Factory, Toronto, has passed into the hands of a new company of which Mr. F. A. Clarry is said to be the manager.

THE Independent Match Company, of Louisville, Que., has been incorporated with a capital stock of \$10,000 and will manufacture chemical matches.

THE Sarnia Maize and Milling Company, Sarnia, Ont., have been incorporated with a capital stock of \$25,000. They will erect and operate a flour mill.

MR. CHARLES RAYMOND, the large sewing machine manufacturer of Guelph, Ont., a few days ago made a shipment of 200 sewing machines to Spain.

THE Converse gypsum quarry, at Mabou, Cape Breton, has been sold to Col. Snow, who has begun work and is manufacturing large quantities of this article.

THE Nottawasaga Farmers' Milling Company, of Nottawasaga, Ont., has been incorporated with a capital stock of \$10,000 and will build a grist mill at that place.

THE Dominion Paper Company, with headquarters at Montreal, has been incorporated with a capital stock of \$300,000 for the manufacture of pulp, paper, etc.

THE Buckler Brick Company, Annapolis, N.S., have added considerable new machinery and appliances, and are now manufacturing large quantities of very fine brick.

THE St. Croix Soap Manufacturing Company, St. Croix, N.B., are making a three story addition to their factory and otherwise enlarging their capacity of output.

THE woolen factory at Marmora, Ont., owned by Mr. T. B. Pierce and operated by Messrs. Mitchell & Danford, was destroyed by fire Sept. 6th, loss about \$8,000.

MESSRS. HIRAM WALKER & SONS, the large distillers of Walkerville, Ont., are preparing 400 acres of marsh land near that place, upon which they will grow cranberries.

MESSRS. STEINLER & EARLE, proprietors of the Pioneer Coffee and Spice Mills, at Victoria, B.C., will build a large factory for the purposes of their rapidly increasing business.

THE Edward Best Car Axle Box and Lubricator Company, of Ottawa, has been incorporated with a capital stock of \$25,000 and will manufacture car axle boxes and lubricators.

THE Saint Johns Electric Light Company, of St. Johns, Que., has been incorporated with a capital stock of \$50,000 and will manufacture dynamos, motors and other electric appliances.

THE L. P. Trottier Axe and Edge Tool Manufacturing Company of Three Rivers, Que., has been incorporated with a capital stock of \$40,000 to manufacture axes, hammers and other tools.

THE new sulphuric acid works at Capelton, Que., of Messrs. G. H. Nicholls & Co., of New York, are nearly finished, and when completed will probably be the largest of their kind in Canada.

THE William Hamilton Manufacturing Company, Peterborough, Ont., are building a new chimney to their works to be 100 feet high, and in the construction of which 85,000 bricks will be required.

THE Amherst Boot and Shoe Manufacturing Company, Amherst, N.S., are working overtime on orders with 200 hands. Their sales last month exceeded those for the corresponding month last year about \$10,000.

THE Pictou Foundry Company, Pictou, N.S., are putting in a lot of new and expensive machinery, included in which is an improved 40-inch gap lathe 16 feet long, a radial drill with radius of five feet and an acme bolt cutter.

THE new saw mill of Messrs. Losee & Morrosin at Shawnigan Lake, Vancouver Island, B.C., has a capacity to cut 25,000 feet of lumber per day. Their shingle mill turns out 20,000 shingles per day, and their lath mill 30,000 laths.

THE Davies-Sayward saw mill at Pilot Bay, on the east side of Kootenay Lake, B.C., is now near completion. The mill owners have called for tenders for delivering 500,000 feet of logs at the mill this year and 3,000,000 feet next year.

MR. W. H. LAW, proprietor of the Central Bridge Works, Peterborough, Ont., is building another large addition to his works and will introduce considerable new machinery, included in which will be a large new compound condensing engine.

A FEW weeks ago the planing mill of Messrs. Scott & Cross, in Toronto, was destroyed by fire. They have secured a new location with a railroad siding, and are erecting a new planing mill and sash and door factory which will soon be in operation.

THE Richmond State Quarrying and Manufacturing and Asbestos Company, with headquarters at Richmond, Que., has been incorporated with a capital stock of \$150,000 to quarry and manufacture roofing slate, slabs and other products of slate, clay, asbestos, etc.

THE Colonial Manufacturing Company, Toronto, have taken over the plant and business of the Colonial Umbrella Manufacturing Company, and have secured a suitable factory in Melinda Street where they will continue the manufacture of umbrellas, parasols, canes, etc.

COMPAGNIE DE FECULE DE MARIA (The Maria Fecula Company), has been incorporated with a capital stock of \$10,000, with headquarters in the municipality of Maria, County of Bonaventure, Que., to manufacture fecula from potatoes and other products derived therefrom.

THE Portage Milling Company are building a second elevator at Portage la Prairie, Man. Its capacity will be 50,000 bushels. This will give the Milling Company storing capacity for about 175,000 bushels of grain at the mill. An electric plant for lighting purposes is also being put in the mill.

THE Toronto Rolling Mill and Forging Company, of Toronto, have been incorporated with a capital stock of \$200,000, and will erect works at West Toronto Junction. They will take over the plant

and business of the Toronto Drop Forge Company, whose works have heretofore been in Toronto.

THE Calgary and Edmonton Railway Company are building at their shops at Calgary, Man., a number of boarding cars for the accommodation of the hands at work on their road. These cars are 60 feet long, 12 feet wide and 16 feet high, and will give sleeping accommodation to about ninety-six men each.

THE new repair shops of the Canadian Pacific Railway Company, being built at West Toronto Junction, will be pushed to completion as rapidly as possible. A million brick is being delivered for the construction of the building, which will be considerably larger than the Toronto shops, and which will give employment to about 300 hands.

ON False Creek, Vancouver, is a tree cut into four 24-foot logs. It is a large specimen of the Douglas fir. These four logs were respectively 84 inches, 76 inches, 70 inches and 60 inches in diameter. "and in none of them was there a knot or other defect," says the account. The total quantity of lumber that can be cut out of this tree is 28,614 feet.

THE Menasha Wood Split Pulley Company, of Menasha, Wis., have recently filled orders for their hickory pulleys from Messrs. Conkey Bros, Preston, Minn.; Wm. Rogers Manufacturing Company, Hartford, Conn.; Minnesota Iron Company, Soudan, Minn.; Fox River Paper Company, Fox River, Minn., and Manchester Locomotive Works, Manchester, N.H.

MESSRS. H. R. IVES & Co., Montreal, have had plans prepared for the rebuilding, upon an enlarged scale, of that portion of their hardware and stove works recently burned at Longueuil, near that city. It is reported that the Longueuil works will be started as an independent business, to which will be added the manufacture of locks, and a limited company with large capital formed to carry it on.

MESSRS. J. & A. BERTRAM, Toronto, are successfully placing on the market ferro-coppertin, a new anti-friction metal manufactured by them. It is durable and cold running in the highest degree. The name of this firm is a guarantee that any article they offer for sale is just as it is represented to be; and they claim that their ferro-coppertin, as an anti-friction metal, cannot be surpassed in Canada or the United States.

THE British Columbia Pottery and Terra Cotta Company, Victoria, B.C., has been incorporated and will take over the plant and premises heretofore owned by Messrs. Keller & Burns and enlarge and continue the business. New machinery has been ordered and new kilns are being built. The company will manufacture sewer pipe, drain tile, flower pots, chimney pots, tiles, terra cotta and architectural work, etc.

THE first annual meeting of the Montmorency Cotton Manufacturing Company took place a few days ago at Montmorency, Que. The factory only started in January last, and great satisfaction was expressed at the result of the first six months' working. The goods are becoming favorably known in China, and the demand for the same is in excess of the mill's production. The shareholders are satisfied, and are already increasing the capacity of the mill.

MESSRS. W. L. JOHNSON & Co., of Gambier Island, Howe Sound, B.C., whose shingle mill and machinery were recently destroyed by fire, have rebuilt and are running again on a larger scale than ever. Since starting up over a million shingles have been turned out, for which a ready market has been found. The new mill is larger than the old one, its capacity is greater, but so great is the demand for its output that the establishment has to be kept running night and day.

THE new works of the Hamilton Powder Company, at Nanaimo, for the manufacture of blasting and sporting powder, are making very satisfactory progress, and will be ready for working about October 15th, the machinery being most of it in place. It is capable of turning out 400 or 500 barrels per day during the ordinary working hours, and, it will be apparent, can do very much more, if required, by putting on additional shifts.—Victoria, B.C., *Colonist*

THE McLaren-Ross mills on the Fraser River, near Westminster, B.C., are rapidly being got into condition for cutting operations, says the *Columbian*, and only the finishing touches remain to be added to the works. The monster band saw and its mass of machinery has come to hand and is now being set in position, and when this machine is ready for use, which will be in about a month's time, the whole establishment will commence running with a full complement of hands.

MESSRS. PARK, DAVIS & Co., of Detroit, Mich., who made such a fine display of their products at the recent Toronto Fair, are establishing extensive works at Walkerville, Ont., from which they will supply their Canadian trade. This is one of the largest concerns in the United States engaged in manufacturing drugs, chemicals, medicines, etc.; and it is intended, when their Canadian works are finished, to do all their foreign trade from them. The building they are now constructing at Walkerville will cost \$20,000.

It has heretofore been stated in these pages that Messrs. Goldie & McCulloch, of Galt, Ont., were constructing a mammoth steel vault for the Dominion Department of Finance at Ottawa. The work is approaching completion, the steel boxes to contain valuables being put in place. Each of these boxes is one foot wide, one foot deep and two feet long, and are intended principally to contain securities, now valued at about \$19,000, deposited with the Government by insurance companies doing business in Canada.

EVERY season shows marked improvement in the binding machines and mowers offered to Canadian farmers, and simplicity and strength in the parts where it is most required, are marked features. The knoter has always been a source of trouble in the harvest field, but we know that the binders for 1891 will embody a simplicity in the construction of this important adjunct which will be hailed with pleasure. The prices of binders are now down to the ordinary cost of a reaper some years ago, which places this wonderful labor-saving machine within the reach of all.

SHIP building is pretty brisk along the Maitland shore. At South Maitland Adams McDougall, Esq., is building one of 197 feet keel, 40 feet beam and 25 feet hold. At the same place a vessel of 211 feet keel, 41 feet beam and 24 feet hold is being built by W. P. Cameron, Esq. Both are to be launched this season. At Monteith's yard, Maitland, one of 1,900 tons register is building. Her dimensions are: keel, 227 feet; beam, 43 feet, and hold, 24½ feet. W. T. Ellis is foreman, and Jas. Monteith, Esq., master-builder and one of the owners.—*Amherst Record*.

THE Kingston Hosiery Co., Kingston, Ont., have bought the exclusive right for Canada to build and operate a new machine for making a full fashioned seamless sock or stocking that conforms to every curve of the foot and leg, including the instep. It is claimed that this is the only machine that has been able to accomplish it. The machine, for the right of which the company have paid \$50,000, is a very complicated affair, but turns out its work without any attention other than the supply of bobbins of yarn. One boy or girl could attend thirty of the machines. The company are making the machines themselves, and are having a limited amount of goods ready for the fall trade.

THE Acme Silver Company have now got fairly settled down in their new factory on Hayter Street, Toronto, and their improved facilities for manufacturing are already beginning to tell in the quantity of work they are turning out. The new building is very convenient, and when the contemplated improvements are all completed, will be one of the largest and best equipped factories of the kind on the Continent. The show-room and offices are finished in varnished oak and present a very handsome appearance. Manager Parker showed us a large quantity of goods which were being got ready for a customer in Australia, in which country the Company have for some time been doing a large and constantly increasing business.—*The Trader*.

THE Brosius Motor Sewing Machine Company, which was recently organized in Toronto with a capital stock of \$300,000, have bought out the Wanzer Sewing Machine Company of Hamilton, Ont., and will erect factory buildings at West Toronto Junction, to which they will transfer the Wanzer plant. The buildings which are to be erected will include main factory, 300x40 feet, three stories and basement; foundry, 125x50 feet; engine and boiler house, 40x30 feet; cabinet shop, 150x35 feet, two stories; and japanning house, 50x30 feet, two stories, making in all about 75,000 square feet of floor space. The works will give employment to between 300 and 400 hands. This is an American concern brought to Canada through the influence of the National Policy.

THE Edison General Electric Company, of New York, have secured some thirty acres of land in Peterborough, Ont., upon which they will build works which are intended to supply the Canadian demand for all electric apparatus in their lines. Their engineer has received instructions to prepare sites for six large buildings, which are to be constructed of stone and brick. At these works will be manufactured dynamos, pumps, all sorts of electrical supplies, and all kinds of electrical machinery. The buildings already ordered will cost about \$30,000, and give employment

to about 300 hands. This Company now have works at Montreal, Sherbrooke, Que., and Hamilton, Ont., but these will be abandoned when the Peterborough works are ready for occupation.

THE Burrell-Johnston Iron Co., Yarmouth, N.S., are employing their usual force of workmen, and have just completed four turn tables for the Digby and Annapolis Railway, and have, during the past year, made for the same road 200 tons or more of castings, as well as supplying the contractors, Messrs. O'Neil and Campbell, with a large amount of machinery, rock breakers, steam engines, etc. They are busy chiefly with their specialties, marine machinery, mill and mining machinery and steam pumps of all kinds. In the steam pump line they are prepared to compete with the world, and are constantly turning out large numbers of pumps, comprising air and circulating pumps for steam boats, electric light stations, etc., as well as steam pumps for all kinds of use. They are the owners of the celebrated "Patten" valve motion for Canada, a valve motion that has always given satisfaction on all the steam pumps it has been applied to. They also make a large line of crank and fly wheel steam pumps. They are always busy, and always ready to undertake anything in their line and guarantee prompt delivery.—*Halifax Critic*.

ASBESTOS mittens to guard the hands are made for firemen, assayers, refiners, etc., and armed with a pair the artisan or worker can grasp hot irons, crucibles and the like without discomfort. Masks, too, for the face are made of asbestos, which are fireproof, and the heat from the hottest fire is said not to penetrate to the skin. Air is drawn from beneath the mask for breathing, so that the burned or flame and smoke laden atmosphere is not inhaled. Aprons and insulating coverings for the entire body are also constructed, having like protective qualities, and for firemen complete suits of asbestos fireproof cloth are made. For domestic use sad-iron holders of asbestos may be made, and with these the grasp of the iron, however hot it may be, never causes pain or burning. Plumbers are likely to welcome asbestos cloth for joint-wiping, and large holders, intended for use by smelters, molders and workers in metal generally, are among the more recent uses of this mineral. The asbestos thus prepared is very flexible, and even the mittens are sufficiently pliable to permit of small objects being readily picked up and held in the hand wearing them.

THE J. B. Armstrong Mfg. Co., of Guelph, Ont., and Flint, Mich., U.S., have received the handsome silver medal awarded to them for their exhibition of carriage goods at the Melbourne, Australia, Exhibition. The obverse is the likeness of Her Majesty, taken from the Jubilee medal, with the exception that the crown on that work is replaced by one taken from the New Zealand war medal. On the reverse is a wreath, composed, on the right side, of the British oak, and on the left, of the Australian wattle, the two sides of the wreath being bound together at the stems by a true lover's knot; the wreath thus symbolizing the idea of unity and affection between the Mother Country and the Colony. In the centre of the wreath is the motto, "Artibus Dignis Honor Insignis," and the five stars of the Southern Cross. The award is one well worth keeping, especially as it has been won by their goods on their merits. We understand duplicates of the Australian exhibit of this firm were shown this year at all the leading fairs, including Toronto Industrial, Ottawa Central, London Western and St. John, N.B., International, covering all their improved specialties, an inspection of which was instructive and profitable to all interested in their line.

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**CULTIVATION OF FLAX VERY PROFITABLE.**

The extensive cultivation of flax for fibre in this country will not only aid in the solution of the binder twine problem, but will yield a profit to the farmers that will put them so far out of debt in a short period of time that they will have no excuse whatever for the cry, "farming don't pay." This is not an opinion; it is a fact beyond dispute. In Miami county, Indiana, alone there was planted 4,000 acres of flax this year. With seed at \$1.00 per bushel and tow two cents and fibre eleven cents per pound, it is safe to estimate that the amount realized from the 4,000 acres reached the sum of \$320,000, of which at least forty per cent. is clear profit. The following communication from W. D. Hall, secretary of the Minneapolis (Minn.) Board of Trade, is a clincher:—

Practice and time are necessary to become proficient in this branch of husbandry. Until you have learned by experience to handle the flax straw so as to realize the best results, I would advise you not to invest money or credit in any machinery, but to do what you can by hand and with your own labor, during the winter months. I will soon have samples of machines that every farmer can make himself at a cost not to exceed \$2 00 and with which he may, himself, during the winter months, work out the fibre of from one to six acres of flax straw, that will bring from \$100 to \$500. My advice to every man who raises flax is, to take from one to six acres of his present crop, just what he can handle well himself, and treat and work as above. Experience will soon enable you to produce as good fibre as is produced in Ireland or any other country and I can promise you a cash market in Minneapolis for all the fibre you can produce. The following statement will show you what one man has done and does every year:—

Mr. E. Bosse, of Green Bay, Wis., in a recent communication says: "The six acres of flax grown on my farm last year, and referred to in the Gazette of Green Bay, February 3rd, was sown on the first day of May, 1889, with one and one-half bushels per acre of Belgian seed (which I consider the very best for this country). I pulled it by hand a little before ripe; let it dry standing on the ground for eight days; then bound it with rye straw, and sheltered. I threshed it by hand and spread it on land already harvested and let it rot by dews and rains; then stacked it in the barn again but bound this time with its own straw. I scutched it by the old system (breaker and knives, still the best in use when

the work is done by skilled scutchers). The soil is a black loam mixed with black sand about ten inches deep, with red clay for subsoil. The result was as follows:

Sowed nine bushels Belgian seed, at \$1.50 per bushel, .....	\$13 50
Pulling by hand .....	32 59
Binding and sheltering .....	5 00
Threshing by hand .....	20 65
Retting on the ground .....	19 40
Scutching .....	120 83
Shipping .....	10 00
Freight to Boston, about .....	30 00
	\$251 97

Product:

60 bushels seed, valued at \$1.00 ....	\$60 00
600 pounds tow, 2 cents per pound ..	12 00
3,718 pounds fibre, at 11 cents per pound, as offered by manufacturers, Ross, Turner & Co, Boston .....	408 98
	480 98
Net profit .....	229 01

I think we can estimate this as an average crop, with careful preparation of the ground (which I described in a preceding letter) and well conducted operations in retting and scutching.

The reason for sowing thick is to have the straw longer and finer, as it is only valuable for fibre from the root to where it branches out. The ordinary flax grown here will produce a good quality of fibre if pulled or cut close to the ground at the right time, and properly treated. Try one or more acres this year and see what you can do."

These figures have been quite extensively circulated among the farmers of the West, and will do great good. If our agriculturists generally pay as much attention to the cultivation of flax for fibre as have those of Miami county, Indiana, both corn and cotton will have to divide the throne with flax. If one county can earn \$320,000 in a single season off of 4,000 acres, what could fifty counties in a State do? And what could fifty counties in twenty States do? There can be no doubt that in a few years flax will be generally cultivated throughout our country.—*Farm Machinery.*

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Full particulars of strength, tests, etc., furnished on application. Endorsed by leading Cities, Engineers, Railways and others.

**ROACH LIME.** Particularly adapted for paper manufacture gas purifying, etc.



## JAMAICA EXHIBITION, 1891.

AN EXHIBITION will be held in Kingston, Jamaica, in January, 1891, of Island products, manufactures and works of art, together with exhibits of works of art, machinery and industrial and agricultural products from Great Britain, other countries and colonies.

In view of the geographical relation of the Island of Jamaica with the sea ports of Canada, and the nature and extent of the imports of Jamaica, as well as the produce of the Island, the Government of Canada accepted an invitation of the Government of Jamaica to participate in such Exhibition, with a view of obtaining an extension of markets for the products and manufactures of Canada.

The Canadian Government will undertake to pay freight of all approved exhibits. Entries must be made not later than September 30th next; and the latest date at which exhibits can be sent forward from Halifax, N.S., or St. John, N.B., will be about October 20th, as all exhibits must be in Jamaica early in December.

Mr. Adam Brown, M.P., has been appointed Honorary Commissioner to represent Canada at the Exhibition.

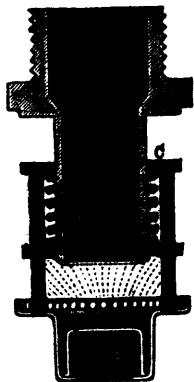
Forms of application and general information can be obtained on application to the Honorary Commissioner, Hon. Adam Brown, at Hamilton, Ont., Mr. H. B. Small, Secretary Department of Agriculture, Ottawa, or Mr. Frederic Nicholls, Secretary Canadian Manufacturers' Association, Toronto.

By order of the Minister of Agriculture.

Ottawa, July 24, 1890.

H. B. SMALL,  
Secretary Dept. of Agriculture.

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WITH

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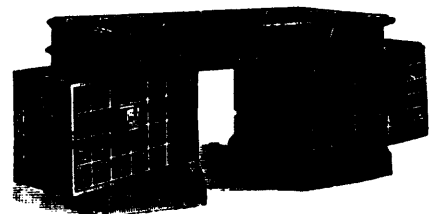
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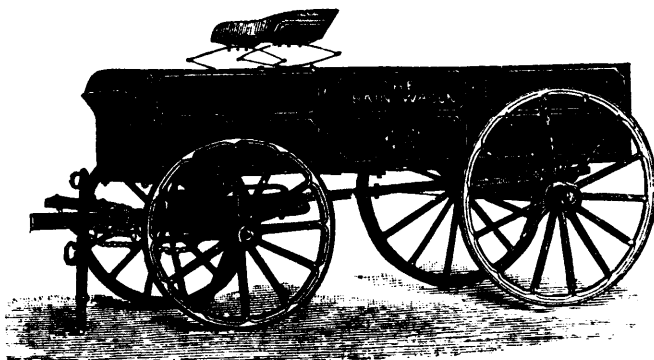
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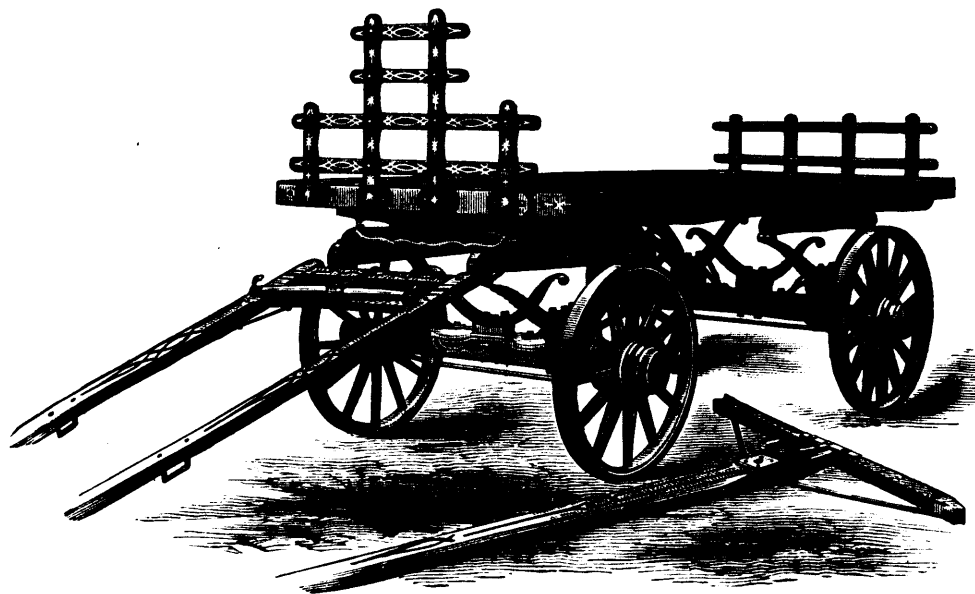
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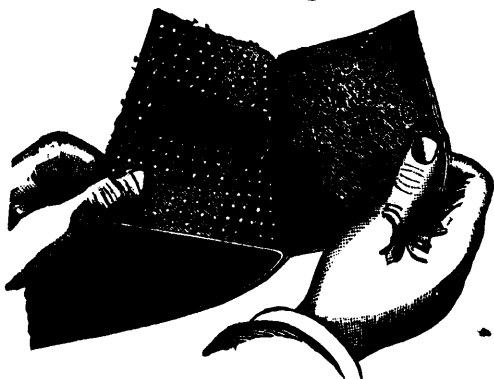
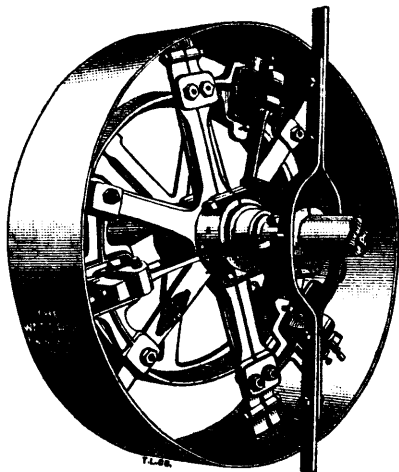
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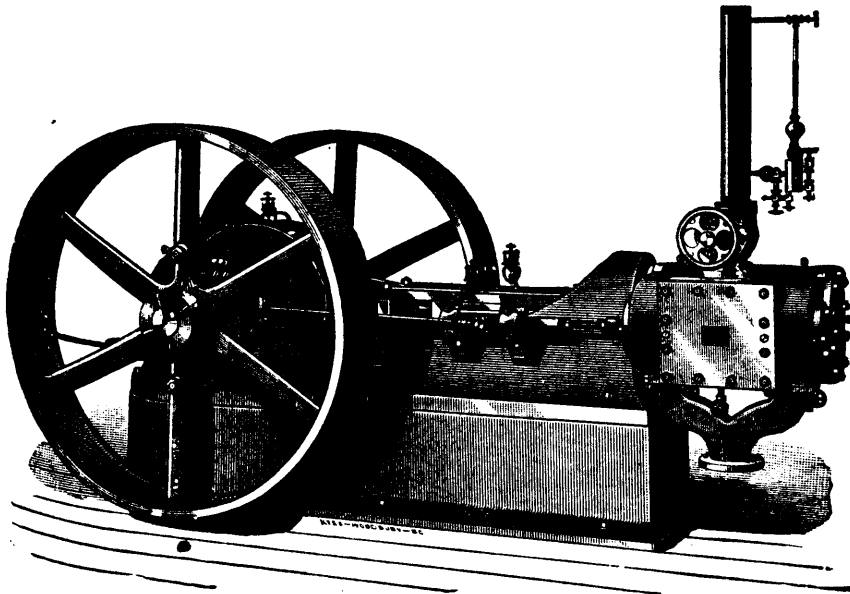
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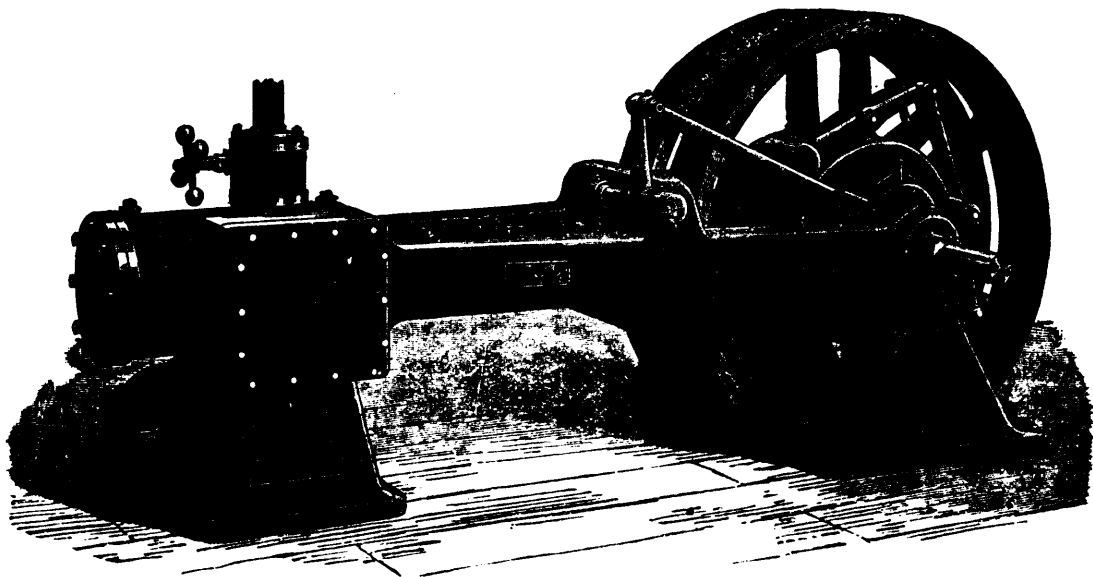
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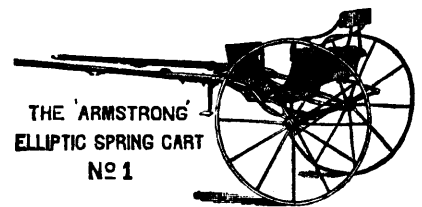
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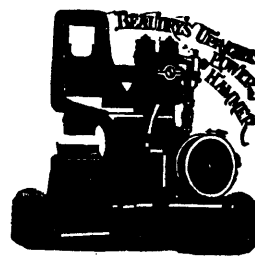
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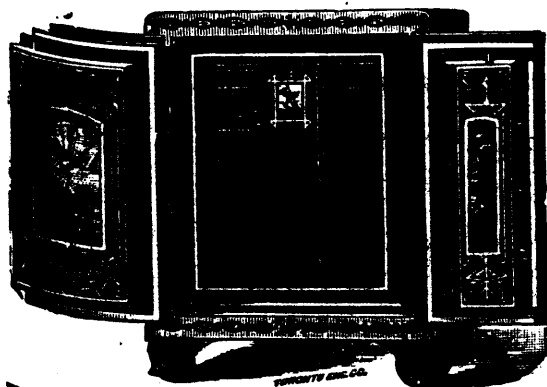


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The direct route between the West and all points on the Lower St. Lawrence and Baie des Chaleur, Province of Quebec; also for New Brunswick, Nova Scotia, Prince Edward, Cape Breton and the Magdalen Islands, Newfoundland and St. Pierre.

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The through express train cars of the Intercolonial Railway are brilliantly lighted by electricity and heated by steam from the locomotive, thus greatly increasing the comfort and safety of travelers.

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RAILWAY OFFICE, MONTREAL, N.B., June 18, 1890.

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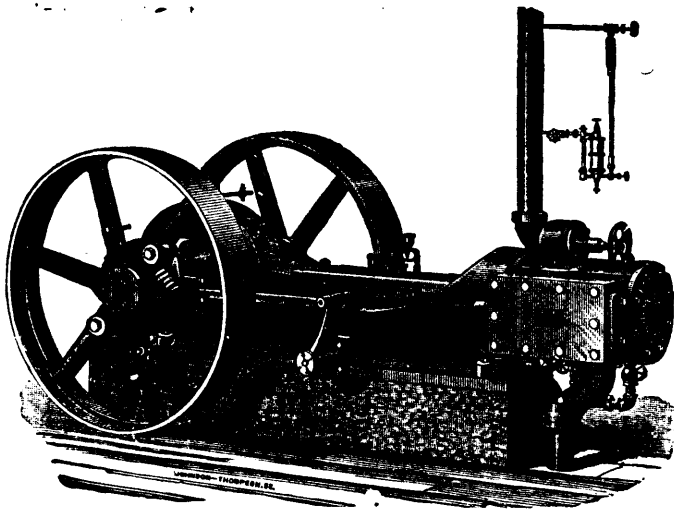
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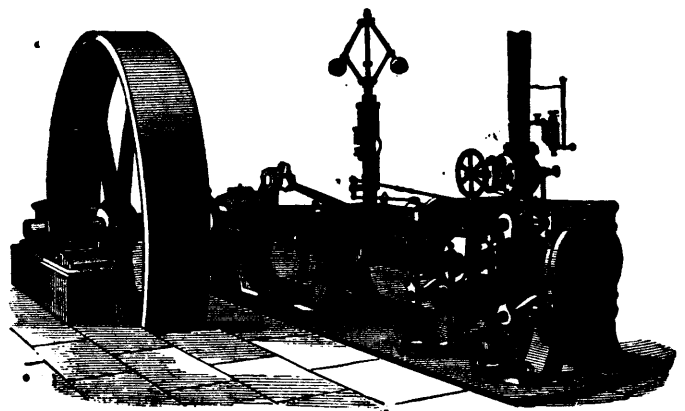
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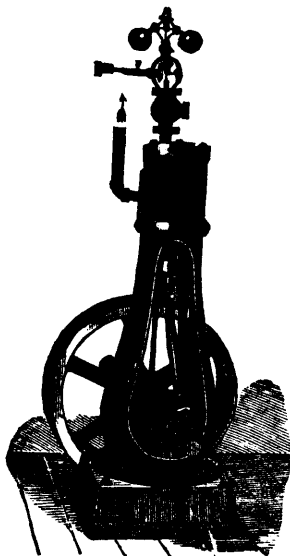
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Armington & Sims Electric Light Engines.



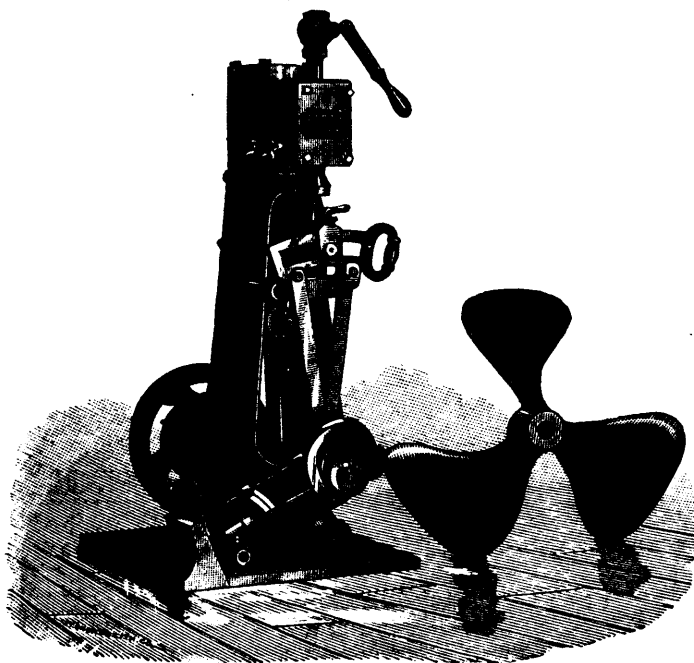
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# WHAT PROMINENT POWER USERS' HAVE TO SAY

FOR

# The Dodge System of Rope Transmission

*MONTREAL, March 5, 1890.*

DODGE WOOD SPLIT PULLEY CO., Toronto.  
 GENTLEMEN,—In answer to your favor of Feb. 20th, have to say that we have run your split pulley and rope system for the past two years steadily, and it is with pleasure we can say that it has worked thus far perfectly. We would not exchange it for belting or shafting for any reasonable consideration. We think it to be decidedly the best system in existence.  
 Very truly yours,  
 THE GRANBY RUBBER CO.,  
 S. H. C. Miner, President.

*ONTARIO AGRICULTURAL COLLEGE,  
 GUELPH, March 7, 1890.*

DODGE WOOD SPLIT PULLEY CO., Toronto.  
 DEAR SIR,—We have your system of rope drive in operation here, transmitting motion a distance of sixty feet, straight drive. So far we have found it very efficient and more satisfactory than any system we have previously had in use.  
 JAMES McINTOSH,  
 Mechanical Foreman.  
 THOMAS SHAW,  
 Professor of Agriculture.

*CENTRAL PRISON, TORONTO, June 23, 1887.*

THE DODGE WOOD SPLIT PULLEY CO., Toronto.

GENTLEMEN,—You desire me to report upon the set of pulleys put in one of the workshops to transmit power by a rope to a counter shaft at right angles, and I have pleasure in doing so. Prior to their having been put in by you I had first used a two ply leather belt, 12 inches wide, of the best quality, which only lasted a few weeks; then I got a six-ply rubber one, same width, made specially, and it also gave out in about a month, the trouble being the quarter twist on short distance between centres, ten feet, and the high rate of speed called for. Your pulleys have now been in use over six months, and with a 3/4 inch manilla rope the full power required is transmitted steadily, and with great regularity, since it does not slip, as the leather and rubber belts did, while very considerable power is saved. They have realized to the full all that was promised from them, to my entire satisfaction.

Yours respectfully,

JAMES MASSIE, Warden.

*MONTREAL, March 4, 1890.*

DODGE WOOD SPLIT PULLEY CO., Toronto.  
 GENTLEMEN,—In answer to yours of 20th ult., asking our opinion as to the merits of your system of rope transmission, we would say that we have fitted several factories with one or more, and in each case our customers have been entirely satisfied with the result. As long as this system continues to prove so satisfactory, we will recommend it to our patrons instead of long lengths of belting and shafting.  
 Yours respectfully,  
 MILLER BROS. & TOMS,  
 J. B. Miller.

*BROADFOOT & BOX FURNITURE CO.,  
 SLEAFORTH, ONT., March 21, 1890.*

DODGE WOOD SPLIT PULLEY CO., Toronto.  
 DEAR SIR,—Answering your letter of Feb. 20th, would say that the rope transmission power, which we purchased from you, has proved very satisfactory to us. We have been running very steady for over two years and can find no fault with it. We think it a splendid system. Wishing you success.  
 We remain,  
 Yours very truly,  
 BROADFOOT & BOX FURNITURE CO.

*TORONTO, June 22, 1887.*

DODGE WOOD SPLIT PULLEY CO., Toronto.

DEAR SIR,—We have pleasure in saying that the Rope Transmission of Power has worked well with us, it saves steam and friction and is noiseless; all great advantages, we think.

Respectfully yours,

MORSE SOAP CO.,

John Taylor & Co.

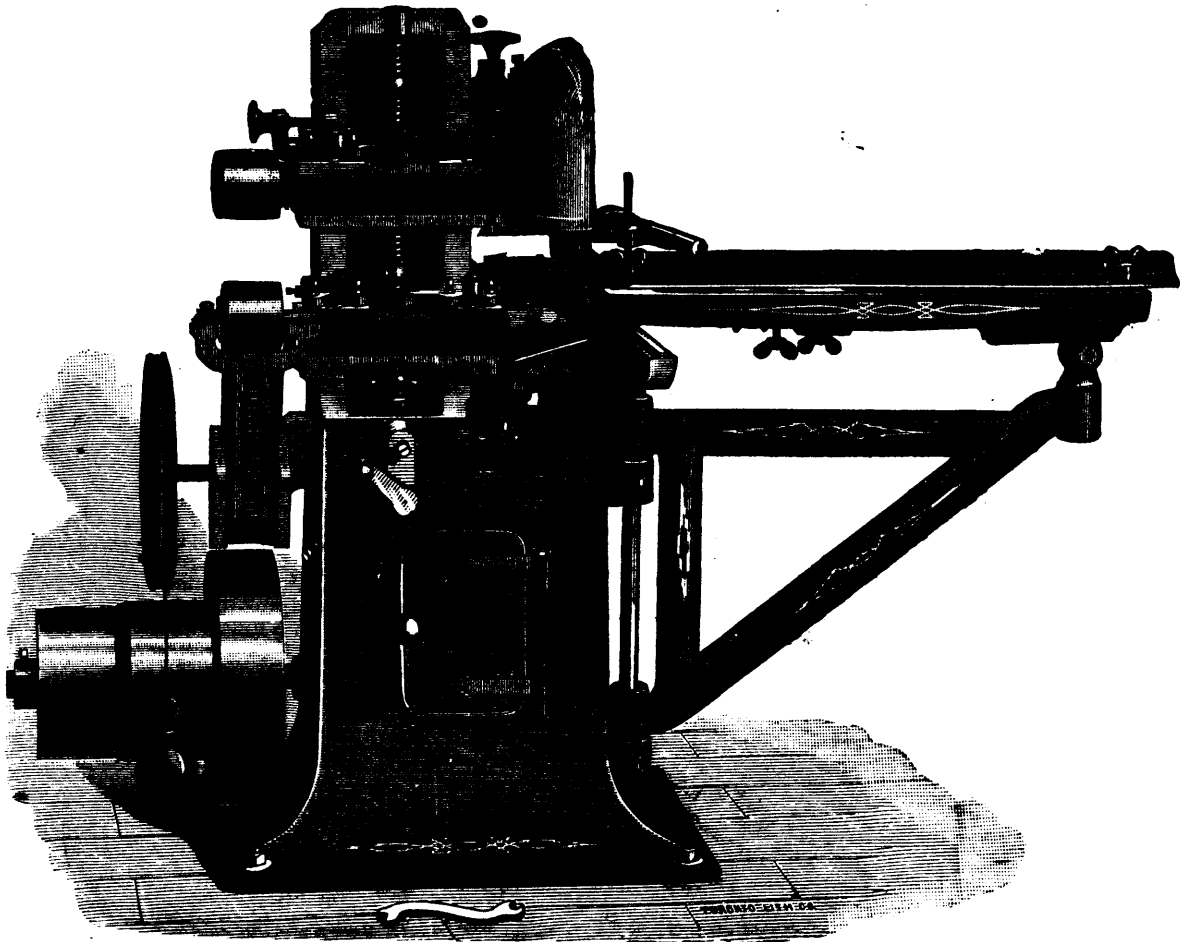
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# Dodge Wood Split Pulley Co.

## TORONTO, ONT.



# NEW AND IMPROVED *Pedestal Tenon Machine.*



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

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

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

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

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

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

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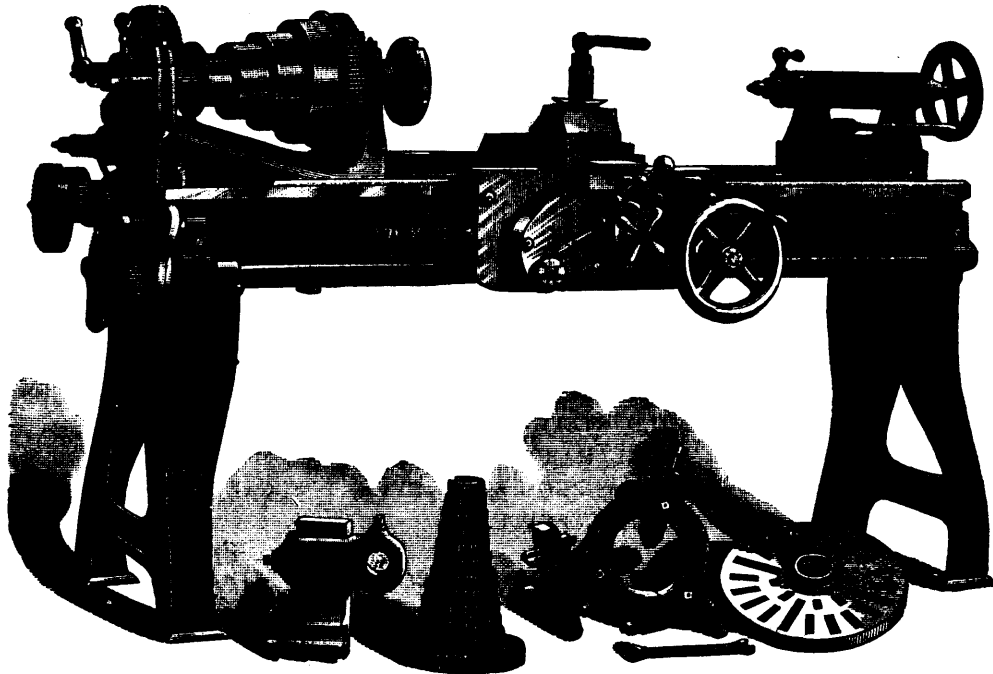
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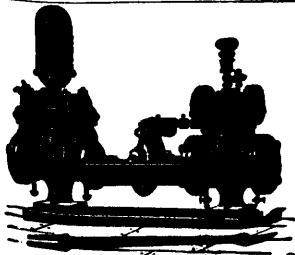
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MOULDERS,  
TENONERS  
BAND SAWS,  
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SAW BENCHES

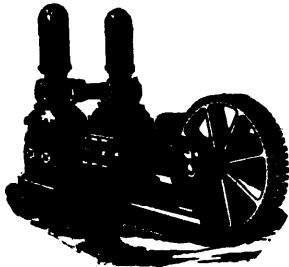
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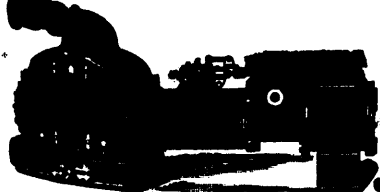
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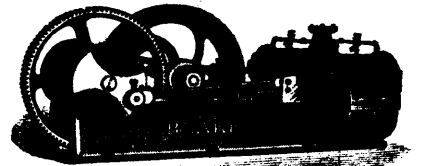
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\* NEW YORK

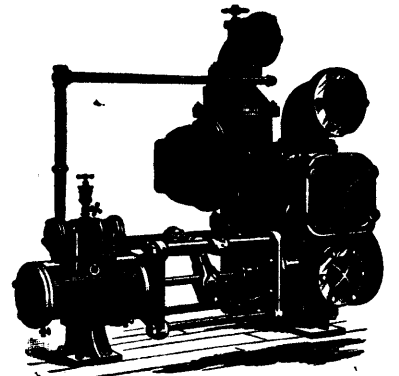
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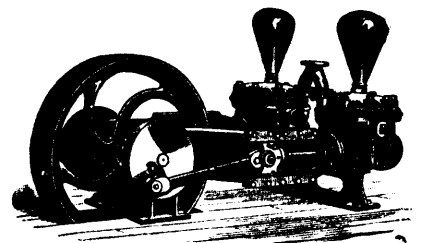
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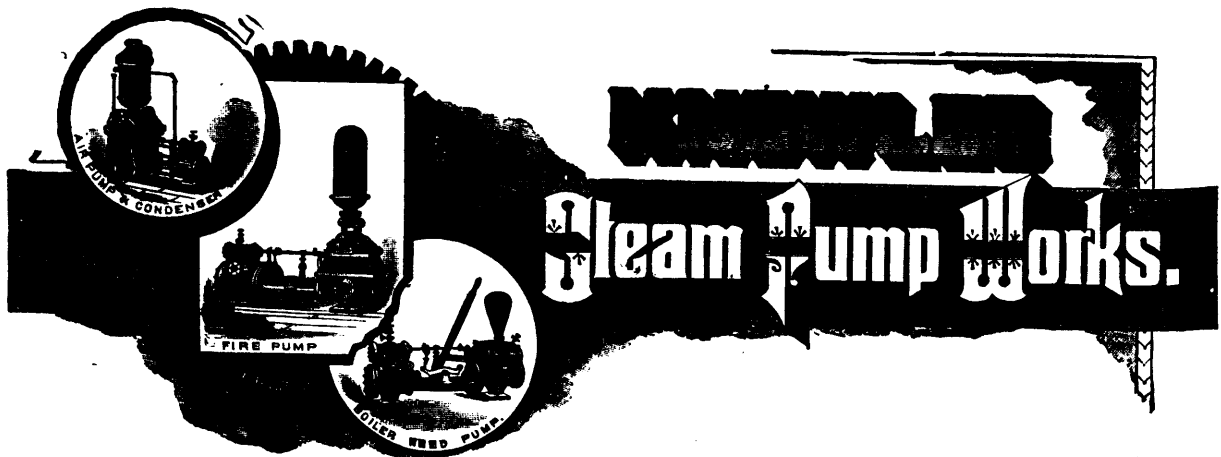
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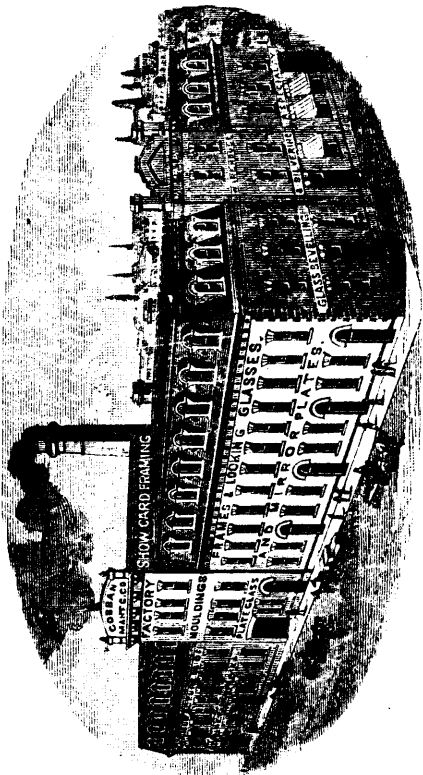
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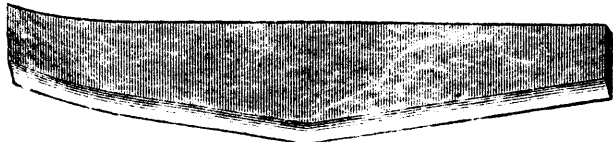
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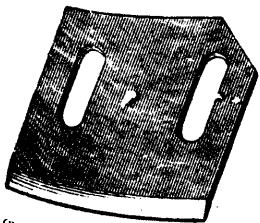


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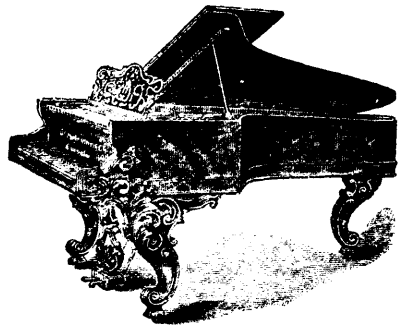
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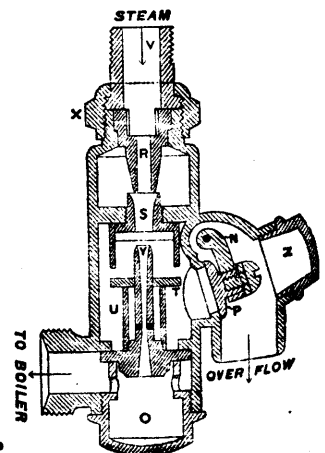
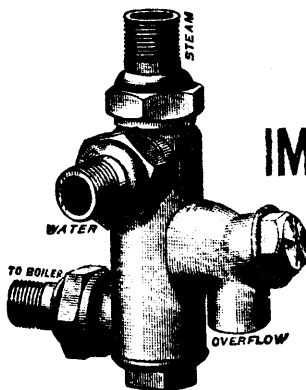


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