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Vol. 21.

TORONTO, OCTOBER 2, 1891.

No. 7.

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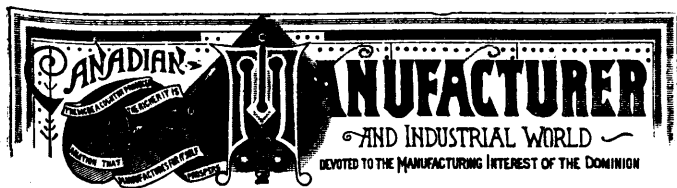
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A DEPARTMENT OF MANUFACTURES

The administration of public affairs of Canada is divided into the following thirteen departments: Finance, Justice, Public Works, Railways and Canals, Militia and Defence, Customs, Agriculture, Post Office, Marine and Fisheries, Inland Revenue, Interior, Indian Affairs, and Department of State. By a Bill which was passed in 1890, the Geological Survey, which had been a branch of the Department of the Interior, was made a separate Department, under a deputy head. Provision has been made by legislation for the amalgamation of the Departments of Customs and Inland Revenue, the new Department to be known as that of Trade and Commerce, presided over by a minister, while in the place of the present Ministers of Customs and Inland Revenue, two comptrollers will be appointed. This arrangement has not yet been carried into effect.

Whether any of these departments might be abolished or not, there is a passing need for a department of the Government which should be devoted to the interests of manufacturers. All of the general interests of the country are well looked after and attended to by appropriate departments, and many interests are in charge of departments specially devoted to them, none of which are of any greater importance than those of manufacturers, and yet no branch of the Government is charged with looking after these interests. There should be a Department of Manufactures, whose duty it should be to furnish to

the Government and to the country all important information in regard to manufactures, just as the Department of Agriculture is now charged with furnishing information in regard to their interest. The manufacturing interests of Canada engage the services and attention of a very large per cent. of the whole working population, and exact and comprehensive information regarding them is of as much importance to those engaged in them, and to the whole country, as is such knowledge of the conditions of agricultural industries. Apart from the general value of such information to the manufacturers, and to all other interests, it would possess special value to the Government in enabling them, through this intelligence, to better manage the affairs of State. The only authoritative source from which knowledge of this description can now be derived is from the census reports, and, in the light of the census returns now being presented to the country, such information as it is likely to give regarding our manufacturing industries cannot be deemed very reliable.

There seems to be some lamentable and long-continued blundering in the statistical department of the Government regarding the classification of the exports of the country, the most glaring mistakes being observable in not recording as "manufactures" many articles which should certainly be denominated under that head. According to the Trade and Navigation returns, the export trade of the produce of Canada last year was valued at \$85,257,586, of which \$5,741,184 was classified as "manufactures," and, according to this classification, our export of manufactures amounted to but little more than six per cent. of the total. No doubt all the items in this classification were placed where they belonged, but there were a great many other items credited to other industries which appeared there at the expense of manufactures. Classified as "produce of the mine," we find that the exports for that year included copper, ground mica and salt. These are manufactures quite as much as pig iron. The "produce of the fisheries" included canned mackerel, canned herring, smoked herring, preserved fish, canned oysters, canned lobsters, canned salmon, cod oil, and furs and skins. the produce of fish and marine animals This does not include the process of drying, salting and pickling of fish, the preparation and packing of sounds and tongues, the packing of fresh oysters, etc., all of which operations are closely allied to "manufactures." The canning of fish, lobsters, oysters, etc., is quite as much a manufacturing industry as the preparation of grindstones and leather: the preparation of cod oil for medicinal purposes is a manufacturing process entirely apart from catching the fish; and the curing of furs and skins of marine animals is certainly a manufacturing industry. The "produce of the forest" included potash, pearlash, ships' knees, paling, pickets, planks, boards, and all sawn lumber, shingles, etc. A very large proportion of the value of these items was given to them because of the processes of manufacture expended upon them. "Animals and their produce" included butter, cheese, dressed furs, grease, lard, bacon, pork, beef, canned and preserved meats, etc. These articles are all the product of manufacturing processes. The products of animals from which these articles are made would be valueless without the manufacturing processes through which they pass. Exports of "agricultural products" included dried apples, canned berries, fruits and vegetables; maple sugar, barley malt, flour, etc.

The conversion of grain into flour is not expensive, but it is a manufacturing process nevertheless; and the other items named credited under this head should assuredly be credited to manufactures. In all these items, and many others, their chief value is imparted because of the manufacturing processes through which they pass; and this being the case, they should have been classified as "manufactures," and not credited to other industries; and if this had been done, the statistics would have shown "manufactures" as being at least forty per cent. of the whole of our exports, instead of less than seven per cent. In many instances the classifications are absolutely wrong, as in crediting fine copper as the product of the mine; canned fish and lobsters to the fisheries; potash and dressed lumber to the forest; butter and cheese, dressed furs, and canned and preserved meats to animals and their produce; and canned fruits and vegetables, malt, and maple syrup as agricultural products. Such anomalies are exceedingly ridiculous.

Apart from the general value of the information which would be supplied to the manufacturers by a properly organized Department of Manufactures, it would possess special value to those engaged in both domestic and foreign commerce, as well as to the Government and Parliament. We now have no system by which this important information may be acquired; and there is no way of arriving at any even approximately correct estimate of the value of manufactured products of the country. The machinery of the Department of Agriculture may enable very close estimates to be made regarding the number of bushels of wheat that may be grown in any year, and the production of horses, cattle, sheep, swine, etc., but who can approximate to the value of any line of manufactures, or to the number of hands employed in the different industries? If these facts were known—if we could tell about the total value of our manufactured products, thereby learning what the home consumption really is, and enabling us to compare the facts with the importations from abroad of similar products—we would be able to demonstrate the full importance of our manufacturing industries to the country. To the ignorance existing on this subject may be attributed much of the prevailing sentiment in favor of free trade. The country has no proper conception of the vastness of its manufacturing industries and it can never have until systematic efforts are made to gather and collate facts concerning them; and this can never be done except under the auspices and by the authority of the Government. If such facts could be properly and repeatedly placed before the country, they would be educators which would so strongly impress their importance that the opposition to any system of policy on the part of the Government maintained to encourage and protect our manufacturing interests would virtually cease.

The importance of this matter is emphasized in the fact that much of the most important legislation of Parliament concerns the tariff with which our manufacturing industries are most intimately connected. In fact, our tariff laws are framed with special reference to their effect upon those industries; and yet we see our legislators and the Government constantly working in the dark, frequently at cross purposes, and under misapprehensions regarding the subjects under consideration, and absolutely without adequate means, or any means, of obtaining this information. A Department of Manufactures, properly organ-

ized, and equipped with intelligent and well-trained men, would be able to supply all the information required in this direction, and produce more facts, and more reliable facts, than the census bureau could possibly give. It could obtain even better results than those reached by the Department of Agriculture, for the reason that the fields of operation would be narrower, the individual industries being more compact and accessible.

### PROTECTION.

THE *Toronto Globe* thinks there may be occult reasons for this journal pursuing the course it has anent the sugar duties, and it counsels us to look into other protected industries, and to come down upon those which in their place and measure are just as rapacious as the sugar men. It tells us:

The stereotyped plea of the protectionists, that though the prices levied upon the consumer are exorbitant, still it is his duty to suffer in pocket for the development of the country, has been knocked on the head by the census returns. Those returns prove to a demonstration that population is fleeing to escape the burden and to seek the employment which we cannot furnish because of our inability, cooped up as we are within a narrow market, to develop the natural resources at hand. Stripped of its disguise as a great patriotic engine, the N.P. is seen to be nothing more than a system for enabling the few to rob the many, as witness the sugar tariff; and to supply campaign funds to Tory Ministers for the demoralisation of the people. Morally speaking, it is no better and no worse than Langevin's plan for serving the same evil purposes, and unless all the signs are deceptive it will be bundled off the stage after Uncle Thomas and Langevin himself, at the first opportunity the people have of pronouncing an honest judgment.

We will explain, for the benefit of the *Globe*, that our objection to the sugar duties as they stand does not arise from any "occult" reasons, nor because we do not desire to see proper tariff protection extended to the sugar industry as well as to all other manufacturing industries, but because these duties violate, in our opinion, the very spirit and essence of the National Policy. And we again state what is that spirit and essence. In considering the proposition to extend tariff protection to any industry, that consideration should be debated upon its independent merits. As applied to the sugar industry it should be shown first that the industry cannot exist without protection in competition with sugar producers in any other country; and it should also be shown that the industry may become of enough importance to make the benefit of having it established in the country greater than the duty imposed upon the foreign article. We do not call in question the importance of the Canadian sugar refining industry, nor the necessity of protection to it. With cheaper labor in other countries, the cost of manufacture there is lower than in Canada; and with the cheap transportation by which merchandise is now moved, it would be impossible for our refineries to operate without protection. But while capital is an element to be fully considered in the matter, labor deserves greater consideration; and the National Policy was intended to bestow the greatest benefit upon the greatest number, not upon the greatest capital. We suppose that there is no human being in Canada who is not a consumer of sugar; and for sake of the argument, we admit that the duty increases the price. This then, implies that the duty is a tax which bears upon every one; and

if it cannot be shown that this burden is quite offset by some benefit arising in connection with it, it should be done away with. The question then is, whether it is desirable to have the sugar industry in Canada, and if the duty imposed for its encouragement and protection is just and equitable.

We think the presence of the industry is desirable for several reasons. Considering the fact that every person in Canada is a consumer of sugar, it would be unpatriotic and unwise not to encourage and perpetuate it. We cannot afford to be at the mercy of foreign combines, which we could not possibly control; and the country could well afford to bear the burden

of the sugar tax if in doing so we give employment to labor and capital, and have it in our power to regulate and control such combines as might grow up amongst us, and attempt to unfavorably and corruptly affect trade. The necessity for the industry being thus apparent, and of course the necessity for the protection of it also, the next proposition to be established is the amount of the proposed protective duty. This, in our opinion, should be as near as can be computed, the difference between the cost of the foreign article laid down in this country and the cost of producing it at home. If the duty is less than this difference the industry cannot thrive, and the duty is for revenue, but not for protection. If the duty is greater than this difference then the spirit and essence of protection is violated and great injury is done. The injury is done to the great mass of consumers in that they are compelled to pay more than what should be required of them. If this excess went into the public treasury, and if the

stated from his place in the House of Commons but a few days ago that, "Canadian refiners can manufacture sugar as cheaply as the American refiners"; and our contention is that if Mr. Drummond and Mr. Stairs, representing a large majority of the capacity of Canadian refineries, entertain such views, we are surely within bounds when we declare that the height of the McKinley sugar tariff in the United States should be the maximum measure of the Canadian tariff.

The *Globe* invites us to "look into other protected industries, and come down upon those which in their place and measure are just as rapacious as the sugar men." We give the assurance

that we are ready at all times to "come down" upon any rapacity on the part of any industry; and we request the assistance of our contemporary in pointing out where any such exists. Its bare say so, however, will not be accepted as evidence. The fact is, there are but few manufacturing industries in Canada which are as highly protected as they ought to be, and there are some very important ones which will never thrive and prosper until they receive tariff protection in fact as well as in theory. The pig iron industry, for instance. As important as the sugar industry is to Canada, it is of no more importance than the iron industry; and we call attention to the fact that the one has grown to such a magnitude that it is capable to supply all our demands for sugar, while the other is incapable of supplying more than a tithe of our requirements for iron. There is no reason why we should not manufacture all the pig iron we require, and we would do so if the industry had proper and sufficient tariff protection,



NO UNRESTRICTED RECIPROSECITY FOR CANADA.  
THE NATIONAL POLICY WALL MUST STAND.

necessities of the country required it, it would be all right; but if it went into the pockets of the manufacturers it would be all wrong. The National Policy never contemplated such a condition. As regards our position on this sugar question, we think that Mr. Foster has made the duty too high, and in doing so he forces the people to pay more for sugar than they ought to pay, and that the excess is not required by the Government. Mr. Foster says so—that it does not go into the public treasury—and therefore it does go into the pockets of the sugar refiners. We have good authority for our conclusions. Senator Drummond, who is at the head of one of the largest sugar refineries in Canada, has very publicly declared himself as unqualifiedly in favor of free raw sugar; and Mr. Stairs, M.P., who is closely connected with another large sugar refining industry in Canada,

which it has never had. If there was an abnormally high tariff on iron, so much so that the benefit derived from the presence of the industry did not fully compensate for the burden assumed by the country on account of it, we would "come down" upon it even as we have sought to reform the sugar tariff. And, with equal consistency, we contend that the iron duties should be increased to a point where the establishment of the industry would be an assured success.

There is no disguise about the N.P. It is, or rather should be, just what it professes to be—an engine by which Canada may be made sturdy and strong in its manufacturing industries, placing her in a favorable light when compared with other nations; self-reliant, in that she would not be dependent upon other nations for things which might and ought to be

made at home. The N.P. teaches a lesson of patriotism, which only such pessimists as the *Globe* fail to profit by.

### MIGRATION.

EVER since the census returns were made public, Grit newspapers throughout the land, and Grit orators in Parliament, have busied themselves indefatigably in ringing the changes upon the fact that Canada has not increased in population as largely as had been anticipated; the contention being that our restricted trade relations with the United States had caused hundreds of thousands of Canadians to migrate to that country. The restricted trade relations alluded to consists in Canada preferring to maintain her system of tariff protection to her manufacturing and other industries, rather than to throw open her door to unrestricted reciprocity of trade, not with all the world, but with the United States. The *Globe* tells us that the census returns "prove to a demonstration, that population is fleeing to escape the burden, and to seek the employment which we cannot furnish"; and it prognosticates that, unless all signs are deceptive, the N.P. will be "bundled off the stage" at the first opportunity the people have to go to the polls. Sir Richard Cartwright declares that a large migration from Canada is going on all the time, that the drift of it is towards the United States, and that the men who are going are adherents of the party of which he is the leader; and he tells us that the only remedy for this exodus is to abandon our present policy of tariff protection as against the United States, and go in for unrestricted reciprocity with that market of sixty millions people.

We have recently shown that an American lady, Miss Kate Sanborn, had recently investigated the matter of abandoned farms in New England, and found that there was not less than 3,318 such farms in the State of Maine, 1,342 in New Hampshire, and corresponding numbers in other States. Reference to the recently published statistics of the United States census shows that in the State of Ohio, twenty-eight counties show a decrease of population, in Michigan fifteen counties, in Indiana twenty-five counties, in Illinois thirty counties, in Minnesota six, and in Dakota eleven. So, too, twenty-three counties in the State of New York show a decrease of population in the past decade, seven in Maine and eight in Vermont, the population of which latter State has increased but 136 in ten years. All these States border upon or are in close proximity to Canada, and at the same time they are parts of the American Union, and have the most unrestricted access to the sixty million American market. If, then, unrestricted reciprocity with the United States is the great panacea for such ills as Canada may labor under, what is the remedy for the constantly decreasing population in so many of the counties of the neighboring states. There is no barb wire tariff fence between these states and the rest of the Union, and therefore it is clear that unrestricted reciprocity is not necessarily essential to Canadian prosperity.

There are local influences in certain sections of the United States which operate to attract population, and in these sections there are noticeable increases; but if these phenomena were disregarded it would be seen that the general increase in that country was probably no greater than in Canada. No

political policy in the United States created the local influences here alluded to, nor could it; and the same may be said of this country; for if anything that man could do—if man could create these influences—then surely they would have been extended all over the country, and no section would have enjoyed a monopoly of them, and this would be quite as true regarding Canada as the United States. If man could produce favorable influences in certain localities he could in other localities; and if this were the case, and these influences could be created, we would not observe the fact of the gradual depopulation of so many sections in neighboring states. If man could produce these influences in the United States and not in Canada, and if they could be available to Canada under no other conditions than those of unrestricted reciprocity, then that political change might become desirable.

If the fiscal policy of Canada is driving young men from the country, and if the fiscal policy and the political and social advantages of the United States are attracting them, it does not appear that the exodusters are locating in neighboring states; for if they were, according to Sir Richard Cartwright, their numbers are so large that their presence there would have prevented the decreases of population to which we have alluded.

The remedy for this migration from Canada lies not in unrestricted reciprocity with the United States, or in free trade with all the world, but in a higher protective tariff than what we now have. The census statistics show that the manufacturing cities and towns are increasing in population at the expense of the rural districts. This is because the demand for our manufactured products creates a strong demand for labor, which is better paid than farm labor. This demand for factory labor would be increased, and the pay would also be increased, if by a higher tariff in certain directions much of the goods now imported from the United States and other countries could be made in Canada. It is the boast now of American journals that forty-three per cent. of our importations of manufactures are produced in that country. There is no valid reason why we should not manufacture very much more of the goods we consume than we now do; and if we did, it would insure not only to the betterment of wages to factory labor, but also to larger demand and better prices for farm products. With greater protection we would have more industrial works, better pay for industrial labor, larger demand for farm products and better prices for them, and there would be fewer young men leaving Canada seeking to better their condition. A high tariff is the panacea for migration.

### A CHANGE WANTED.

THE Associated Press, of New York, has been interviewing British manufacturers anent the operation of the McKinley Tariff upon their industries, and it is found that they all want a change made in the American tariff; they want it bad, and they want it instant. Interviews with these British manufacturers show that the metal trade is the one principally affected in the Liverpool district, and the tin-plate trade particularly. There is complete stagnation in this industry at present. The big manufacturers are all hopeful that there will be a change in

the law after the next Presidential election. One of the leading tin plate men said :—

Oh, yes, our Yankee cousins can make tin plate; they are making it now, in fact. But the question is, will it pay them to make it? Possibly the Republican party, knowing that unless the home production of tin plate reaches a certain proportion of the total consumption within three years, the McKinley tariff will fall to the ground, may probably concert to lay down the plant and bear the loss themselves; but otherwise it is unlikely that private venturers will go in extensively for tin-plate manufacture, when a Presidential election, or indeed many other things, may at once upset the new tariff entirely, and ruin their chances of establishing a profitable industry.

Welsh makers interviewed at Cardiff, admit that the time must come when Americans will make their own plate, but they declare that they fear no immediate attempt. Prices at Cardiff have greatly decreased, and are now barely remunerative, but the demand is the same as ever, all the works being again in full operation.

The iron manufacturers of Scotland are at present disturbed by a London syndicate, and cannot export much iron, but the principal cause of the limited exportation lies in the very large increase in the manufacture of pig iron in America, a manufacture which last year surpassed the production of Great Britain. A great deal of steel scrap for remelting went to America, but they say the McKinley tariff has killed this trade. No other kind of steel has been exported from Glasgow to the States for years.

The textile manufacturers say it is too early to see the effect of the tariff upon woolen goods. Glasgow manufacturers have their representatives calling upon customers in the States. As far as the trade has gone, they say the tariff looks as if it were quite prohibitive. Certainly the trade in the lower qualities will cease. High class woolen goods will always be exported, as well to do Americans will insist on having them.

According to Bradford manufacturers the effect of the tariff upon exports to the States has so far proved even more prejudicial to the Bradford trade than was anticipated. But it is thought that when business gets into the normal condition the reduction of the volume of business with the United States will not amount to more than 25 per cent.

At Dundee the opinion is that the effect of the McKinley tariff has been in the linen trade to cause manufacturers to use much smaller yarns and to send to America much higher priced goods. There is they say, in many markets a demand for linens of useful and cheaper makes. The new tariff prevents such goods from being sent, as the duty falls with its prohibitive force upon the ordinary domestic linens.

The most interesting and important statements to America in connection with this investigation were obtained from John C. New, the Consul-General of the United States at London, who was asked what were the effects of the tariff act on the export trade in London and Great Britain. Gen. New said :

I can only give you the facts that have come under my observation in my own office, and those that have been reported to me by the consuls under my jurisdiction. For the six months ending June 30th of this year there was a falling off of about 10 per cent. in the number of invoices at my Consulate-General, and a decrease of from 10 to 15 per cent. in the value of the exports as compared with the corresponding months of 1890. During the same period the reports from all the consulates in Great Britain show a marked decrease in exports of

such articles as silks, fine worsted dress goods, fine unions (which are cotton and linen mixed goods), wool, camel and goat hair goods, and manufactures of iron and steel, amounting approximately to 50 per cent., while the decrease in the value of cutlery exported amounts to about 60 per cent.

The fact should be borne in mind that the McKinley tariff was not aimed against foreign manufacturers as much as it is intended to benefit the American people. The merchandise previously manufactured abroad and imported into the United States, gave employment to large armies of working people in its production. There are large armies of working people in the United States who desire just such employment, and the Government, as it is in duty bound to do, prefer to see their own people employed in the manufacture of this merchandise than to see it made abroad. The change in the situation does not imply that there will be any less work to be done or any less demand for food products by the armies of workmen employed; but it implies that the employment will accrue to American workmen instead of to foreign workmen, and that the food products consumed by the workmen will be consumed as it is produced—on American territory.

#### HONESTY THE BEST POLICY.

OUR able and perspicacious contemporary, the *Toronto Empire*, works in a queer way to counteract the desire of the Opposition to bring about unrestricted reciprocity of trade with the United States. It points to this desire as an anomalous spectacle, in that, being free traders *per se*, they wish to be placed under the operations of the McKinley tariff, which averages thirty or forty per cent. higher than the Canadian tariff. The aim of the *Empire* seems to be, not to argue against protective tariffs; for it professes to be a strong supporter of the National Policy, the foundation and corner stone of which is tariff protection, but to show that Canada would be ruined under the operations of the McKinley tariff. This, we think, is both ridiculous and inconsistent. It points to the fact that some years ago President Garfield advocated what it calls "a moderate fiscal policy," which it thinks the Republic is "unfortunate" in not possessing at this time; and it more than intimates that "the masters of the trusts and combines," which it says now exist in that country, "desire to shut up mills and factories, limit production, dismiss employes, lower wages, and, in short, control labor as well as capital"; that "rival establishments are bought and silenced under lock and key;" and it alludes to a case where an independent concern which had refused to join a trust was blown up with dynamite, and that another monopoly made a bonfire of 30,000 barrels of pitch because the market was overstocked.

We submit that such utterances, if not absolutely false in fact, are false and entirely unreliable in imputation, and are calculated and intended to create and perpetuate hard feelings which cannot possibly result in any good to Canada. The *Empire* argues from a wrong and untenable standpoint. We advance these clean-cut propositions, which we ask it to accept or reject. It is the right of a nation to adopt a policy of tariff protection if it desires to do so; it is its right to impose duties upon certain articles while it imposes no duties upon certain other articles; it is its right to impose



higher duties upon certain articles than upon certain other articles, and to absolutely prohibit the importation of any articles by prohibitory duties, if it desires to do so; and that the judgment and discretion in such matters reside with that nation. We do not discuss the morality of tariffs, but only the right of nations to enforce them. We do not think any sane man will deny these propositions; and any differences which may exist can only be as to whether the best interests of a country are conserved by the enforcement of its tariff laws. Canada has seen proper to adopt certain tariff laws, and the *Empire* sustains the Government in this policy. The United States has seen proper to adopt what we know as the McKinley tariff, and the *Empire* seeks to bring the policy of tariff protection into contempt because it does not agree with the Government of the United States in the details of its tariff law. And to assist in this endeavor it illustrates its contention by telling how American trusts and combines, which it intimates are the fruits of the tariff, desire to destroy and paralyze manufacturing industries and bring both labor and capital under their blighting influence. It does not seem to comprehend that its arguments are like the blunderbuss which was equally dangerous at both ends; and it is interesting to note that while American combines come in for unstinted opprobrium, and the blame for them is laid at the door of the McKinley tariff, it has only words of praise and encouragement for at least one Canadian combine—sugar—and rejoices when the Dominion Parliament persists in making it possible for that combine to squeeze hundreds of thousands of dollars more out of the people of this country than the McKinley tariff allows to be exacted of the American people for a like service. The *Empire* holds up its hands in holy horror because a disappointed scoundrel in the United States attempted to destroy a rival whisky distillery with dynamite, an affair in which the McKinley tariff cut no figure whatever; but it can see no wrong in a Canadian combine, which exists only through and by the grace of the Canadian tariff, absolutely prohibiting the people of Canada having free sugar on their breakfast table, although that boon was ostentatiously promised them by the Canadian Government.

Oh, yes; the *Empire* is for tariff protection in Canada, but it is decidedly opposed to such tariff protection in the United States as the people there have chosen for themselves; and it can only uphold Canadian protection by quoting extracts from stump speeches of Governor Campbell, of Ohio, who is an ardent advocate of free trade, and whose only political hope is to destroy American protection. This is a glorious upholding of the National Policy upon which Sir John Macdonald said depended the happiness and prosperity of this country. We are not advised of the episode of the bonfire of 30,000 barrels of pitch by an American combine, "because the market was overstocked," as the *Empire* alleges; and we must be excused from believing the unsupported statement.

This journal advocates tariff protection for Canada because we think that policy is the best suited to our necessities. The people of the United States think the same of the McKinley tariff. We are uncompromisingly opposed to unrestricted reciprocity with that country, or anything that would tend in that direction, because we think such an arrangement would not be for the best interests of this country; and in our

opinion it would be but a stepping stone to political annexation. That result would be inevitable. But while we are opposed to unrestricted reciprocity, we are not opposed to the cultivation of the most friendly relations with that country; and we consider it unpatriotic, unstatesmanlike, and suicidal in the extreme to hold up to scorn, contempt, and contumely the people of that country and their cherished institutions. Combines and trusts are not peculiar to nations which practice protection. They have flourished in all ages and in all nations; and there are as onerous and cruel trusts and combines in operation in free trade Britain today as there are in the United States or Canada. Therefore the *Empire* is dishonest when it points to American combines and trusts as being the result of tariff protection.

We have a higher and more exalted opinion of the intelligence and good sense of the people of Canada to suppose that they could be influenced by such stuff as the *Empire* would feed to them. Canada is not opposed to, or hostile to the United States because of the McKinley tariff, or for any other cause. There is no hostility or opposition whatever, but there is a difference between the aims of the two countries, which will keep them as far apart as they are now. Canada has her own destiny to accomplish, and that destiny does not lead in the direction of annexation, or even of unrestricted reciprocity. This is a demonstrable proposition, which may be elucidated by arguments which appeal to common sense, not to passion, prejudice, and falsehood.

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#### EDITORIAL NOTES.

CANADA for Canadians.

THE National Policy wall must stand.

A POINTER; Let well enough alone.

No Unrestricted Reciprocity for Canada.

CANADA needs a Department of Manufactures.

THE Canadian market for Canadian manufacturers.

MANUFACTURING industries are the mainstay and hope of Canada. Also of the party professing allegiance to the National Policy.

THE most absolute monarchism of Russia, and the exalted and refined republicanism of the United States, seems to be cut from the same piece of shoddy cloth.

A POINTER for the Canadian Commissioners to Washington; The best interests of Canada do not admit of any reciprocal concessions which will injuriously affect Canadian manufacturing interests.

WILL Premier Abbott please carefully study the spirit of the allegorical picture we present in another page. Also Minister Foster. Also Minister Thompson. Also the *Globe*. Also everybody.

LITTLE pails of whitewash, little pots of paint, make a Tory boodler look just like a (Grit) saint.—Huron, Ont., *Signal*. Right you are, sonny; and it is difficult to distinguish between the two.

A RETURN brought down to the House of Commons a few days ago shows that the total amount of subsidies voted to railroads in Canada since Confederation was \$31,015,491, on a mileage of 4,237 miles.

CANADIAN manufacturers, and the Canadian Manufacturers Association will adhere to the National Policy, and to the Government which upholds it faithfully. Any deviation from that policy will be considered a sacrifice of the interests of Canadian manufacturers.

THE friendliness of the United States for Canada is evinced in the imposition of a duty of five cents per dozen upon Canadian eggs, and the deportation of Canadian workmen from neighboring American cities. And still our American friends tell us that they love us and want to be on friendly terms with us.

THE *Monetary Times* expresses some mild surprise that a first-class woman for a millinery establishment in an Ontario town of 7,000 inhabitants should command a salary of \$1,300 per year. Why not? But what has the population of the town to do with the salary paid? Is the salary regulated by the population?

A MANUFACTURER bent on economizing, decided to cut off his advertising. "It costs me so much money," he said, "and I'll come out just that much ahead." His "ad" appeared in the trade papers no more, and his customers went in at another man's door. His business, unadvertised, ran quickly down, and now there is one manufacturer less in that town.

MUCH of the supplies of fruits such as are grown in the Niagara district of Ontario and consumed in St. John, N.B., went there from this province, being superior to similar fruits of American orchards, and more desirable in all ways, except in the inferior ways they were sent to the market. Canadian fruit growers have yet to learn the importance of attractive packages.

THE boycott which the Grocers' Association of Sarnia is trying to enforce on those grocers who are not members is being pushed, says an exchange, with all the power that it can rally to the fray. The boycotted men still hold out that they will not join the association, and the latter is working hard to prevent goods being sold them by wholesale houses.—*Monetary Times*.

According to Grit doctrine, and the *Empire*, this combine is all owing to the McKinley tariff.

DURING the recent Toronto Industrial Exhibition the Canadian Pacific and the Grand Trunk railroads delivered 250 car loads of exhibits at the fair grounds. It should be remembered that besides this many exhibits were conveyed to the grounds by water transportation, and that all of the Toronto exhibits, and many from the surrounding country, were sent

in on trucks and private conveyances; and this statement gives an idea of the volume of business done there.

N.P. journals pretend to say that Mr. Abbott will not go beyond the Old Man's offer of reciprocity in natural products only; but the N.P. has received a tremendous blow from the census and its adherents are no longer the bosses of the situation.—*Toronto Globe*.

We venture the assertion that Mr. Abbott will not go back of Sir John's offer of reciprocity in natural products only, and we assure the *Globe* that the result of the census will not swerve the believers in protection from their adherence to the N.P.

A YANKEE has invented an improvement in his whipping machine which enables it to be run faster and give a more elastic and effective blow. It can be so regulated that when the whips descend there will be an elastic stop for them, giving a more uniform blow for each whip. A change of gears is supplied so that the speed may be varied. We wish to explain that this Yankee is not a school-master, whose chief occupation is in castigating unruly boys, but a manufacturer of textile goods, and the whipping is of the fabrics made by him.

VALUATIONS in some of the counties in Michigan are being marked down heavily, on account of the disappearance of pine timber, the closing of shipyards, the dismantling of sawmills and the removal to other parts of those who have accumulated fortunes.—*The Iron Age*.

The depletion of Canadian forests of pine timber goes on all the same, and with great vigor, the logs being taken to supply American mills, Canada having nothing to show but the stumps from which they were taken. There should be an export duty on pine logs.

CHICAGO papers speak of an immense cotton mill to be built in that city, the capital stock of the company being \$2,000,000. And thus it is that the cotton industry is slipping away from New England, where it flourished so many years, taking up its abode nearer its sources of supplies and market for distribution. When an industrial establishment disappears from its long established locality the Grit orators allude to the fact as an evidence of the failure of protection; but they do not attempt to show that its establishment in another place is an evidence of the success of protection.

MR. REDPATH, one of the sugar lords of Canada, has generously donated \$200,000 to McGill University at Montreal, in the shape of a library building. Mr. Redpath is one of those who are permitted by the Dominion Government to squeeze hundreds of thousands of dollars a year out of the people of Canada through the operations of an abnormally high tariff on sugar. The masses of the people of Canada are not specially interested in McGill University, but they are interested in the question whether the sugar on their breakfast table cost them more than it ought to, and whether the extra cost to them goes into the pocket of Mr. Redpath.

THE movement of population in Canada in the past decade presents some striking facts. Considering the different Parliamentary constituencies of Ontario, it will be seen that those which return Conservatives, or National Policy members,

increased much faster in population than those which returned Reform or Free Trade members. The population in the Conservative constituencies increased from 978,157 in 1881, to 1,150,676 in 1891, or nearly eighteen per cent.; while in the Reform constituencies the increase of population in the same time, was from 900,684 to 954,765, an increase of only about five per cent.

THE *Boston Journal of Commerce* values a handful of crude pig iron weighing about five pounds at five cents. It would make about sixty table-knife blades worth \$1.50; converted into steel watch springs, there would be about 110,200 of these little coils, which, at the rate of \$1.75 a dozen, would be valued at \$16,070. The consumption of table knives and all manner of cutlery, and of watch springs in Canada is very large; and yet all of the last named article and most of the others are imported from other countries, although just as good iron suitable for manufacture into such goods can be produced here in Canada as elsewhere. What Canada needs in this direction is more liberal protection to our iron and steel manufacturing industries.

THE American people are the most soul-absorbing patriots the sun shines upon, according to their profession, but yet they are not sufficiently patriotic to resort to any means that will cost them money to reinstate their flag on the ocean, and engage in the carrying trade of the world. As important as they would like the world to view them, their own flag is almost an entire stranger in their own shipping ports, about the only evidence to be seen that they take any interest whatever in maritime affairs is the coasting vessels that slip in and out of their harbors between tides employed in coastwise traffic. And even this traffic would not exist for a year if it were not that they actually prohibit the shipping of other nations engaging in it. Verily the Americans are a patriotic people.

As they stepped on the American shore they were met by Inspector DeBarry and a policeman, who told them they would have to go back to Canada, as they were violating the Domicile Law. This morning he secured evidence that John Robbins, a fireman in the Central yard at Black Rock, was violating the Domicile law, as he lived at Victoria, and only came over here to work. The Inspector went to the Black Rock yard, to deport Robbins, and was informed by freight agent Barcomb that he had discharged all the Canadian employees of his department who he was certain were violating the law. During the past two days over 100 Canadians have been sent back to their homes — *Buffalo Despatch to the New York Sun*.

The Star Spangled Banner, O long may it wave,  
O'er the Land of the Free and the Home of the Brave.

Russia deports her people because they are Jews; the United States deports better men because they are not Yankees.

HERE is how the London *Financial Standard* speaks of Cobden and Bright's life-work:

Now the work of their hands fades as the frescoes did from the walls of Parliament. Cotton was never cheaper; never was there more inducement in price to buy and spin and weave it, and the number of nude and semi-nude throughout the world was never greater. But cotton, so far as Manchester is concerned, is a sucked orange, a gone coon, a dead cock in the pit. It has ceased to make profit in Manchester, and now only earns scant wages. So scant are those wages that the services

of school half-timers are requisitioned by parents; husband, wife and children being essential to keeping a pot boiling. No third subscription would now be taken up by John Bull for Cobden unless for a rope. Birmingham also, by this time, has given up Bright. As the colonel (Howard Vincent) said, men do not come to the city to play marbles; they come to make money, and none being made, oratory has no charm.

THE *Advertiser* is an advocate of a persistent effort being made to re-forest Ontario as fast as its forest wealth is cut down and disposed of for the public benefit. In other words, the policy of the forestry department should be to plant as many young trees every year as there are old ones cut down. Thus our timber wealth would be replenished at comparatively little cost. — London, Ont., *Advertiser*.

In view of the fact that immense tracts of land in the United States have been entirely denuded of trees, and that immense tracts of land in Canada are undergoing the same process, the logs being hauled away to the United States to keep American saw-mills in operation, we suggest that the *Advertiser* join us in demanding an export duty upon saw-logs. Perhaps it would be cheaper to preserve the timber we have, using it only for our own use, or cutting it only in Canadian mills, rather than to engage in the planting of young trees as the old ones are destroyed. Impose the export duty upon saw logs.

THE news has been received that the Canadian Government are now admitting all sugar up to 14 Dutch standard duty free, and as this allows certain grades of Demerara yellow crystals to get in, this important change in the tariff should not be overlooked. If the limit had been fixed at No. 16 the Canadian people would have had the chance of buying bright yellow crystals of pure cane juice, at a price so reasonable that they would soon have been induced to buy two pounds where one formally would have served them; but the influence of the sugar refiners in Canada, as in the States, is so powerful that the Government cannot afford to ignore it beyond a certain point. Dark crystals, of course, will go in free without question, and a favorable market now presents itself, but unfortunately it is as yet a very small market, the whole population of Canada being only about five millions. Small as it must be, the trade is worth nursing, for the Dominion is a country with a future, and is rapidly growing in population, so it behoves us to give it proper attention, so as to get a good place amongst the competing suppliers. — Demerara, W.I., *Argosy*.

THE *Monetary Times* argues that if Canadians desire evidence that protective duties tend to restrict the growth of population in young countries, they may find it in the recent census returns of the Australias, which show that population grows fastest in the colonies least protected. Without regarding the question of age, we recall the fact that Britain sprang to commercial and maritime greatness under protection, also the United States. If protection was abandoned in Britain, it was after it had produced all that which was expected of it; and the indications are that protection is likely to soon again become an accepted policy there. The United States, under a judicious admixture of protection and free trade, has become the chief rival of Britain in manufactures, and is fast becoming a formidable rival in foreign commerce. But the prosperities of these countries were laid in the cement of protection, and protection was the corner stone of their prosperity.

If Canada desires similar greatness, it must be achieved in the same way—by protection.

AN American exchange complains that Great Britain and Canada subsidize our trans-Pacific steamers, and thereby England by such means increases her trade with Japan. It points to the fact that Great Britain imposes an import duty upon Japanese tea; that article is admitted into the United States free; and it suggests that this fact might be made the basis of reciprocity negotiations with Japan. It speaks of an "iron clad" treaty between Britain and Japan, and suggests that if Japan is willing the United States will assist her to overthrow this odious treaty. Bow, wow, wow. If the United States wants to increase its trade with Japan, why don't it increase it? Why grumble at Britain's trade? The Canadian Pacific Railroad seems to be a great bugbear to our American friends, but they have three transcontinental roads reaching good harbors on the Pacific coast, and if they want a line of swift steamers from San Francisco to Japan, why don't they build them, or get British shipbuilders to construct them for them. But wouldn't it be funny to see Uncle Sam trying to force an abrogation of Japan's treaty with Great Britain.

THE difference between the American and the Canadian duty upon refined sugar is \$6 per ton, which, upon the consumption of 112,000 tons in Canada amounts to \$672,000 per year. If the Government think it necessary to maintain this difference, they should have arranged the tariff so that this large sum would flow into the Dominion treasury, instead of into the pockets of a few sugar refiners. Being then in the treasury, it would work incalculable good to the farmers of Canada, by paying it out to them in the way of a bonus for the production of beet sugar. McGill University, then, might be out of pocket to the extent of a fine library building, costing \$200,000, presented recently by Mr. Redpath, the Montreal sugar refiner, but the country could well sustain its share of the disappointment of the college. The poor man's breakfast table is unnecessarily taxed to the extent of \$672,000 per year, which goes into the pockets of the sugar refiners; and a college to which the sons of poor men do not have free access is endowed with part of the plunder, which the *Empire* calls a "munificent donation."

A FARMER on the Canadian side, whose land is suited for bean growing, could get his crop across the St. Clair River even if there were no tunnel; but the duty of forty cents per bushel is absolutely prohibitive. The tunnel will be of great service to the railways, but ten thousand tunnels along the frontier could not undo the mischief wrought by the N.P. on the one side and the McKinley Bill on the other.—*Globe*.

The reason why the American tariff imposes a duty of forty cents per bushel upon Canadian beans, is because, according to the long established policy of that country, it is held that the American market for beans should be reserved for American bean-growers. If Canada desires to become annexed to the United States and the United States will consent to the arrangement, and it is consummated, then Canadian bean-growers would enjoy the American market just as the American bean-growers do. Otherwise not. It would be bad for Canada if her farmers could grow nothing but beans, and there was no other market for beans than in the United States. But this is not

so, and the unfriendly legislation of our neighbors should teach us to look to other of our resources. How about raising fat cattle, which are worth ten dollars more per head in Britain than American cattle. The gods help those who help themselves.

A CITY contemporary notices the fact that most of the ladies' mantles, cloaks, wraps, etc., being offered by the jobbers this season are, as heretofore, of German make; and in speaking of the materials of which home-made wraps are made, says:—

It is of interest to a Canadian who takes an interest in his country's industrial progress, to observe the quality and finish of the mantlings and costume cloths produced by Canadian looms. The improvement in some lines is very marked. Where a fabric has been turned out for the first time, there are, in some instances, defects of finish or a muddiness in the pattern or the check, but in others the goods are simply admirable value, and of neat design and finish. We observed some double width mantle check of domestic make for winter wear. The summer goods is very pretty and very creditable. There are, too, Canadian costume cloths, in plain colors, with a finish like a beaver. These are, as the merchant who lovingly handled them, said, "lovely goods."

An important fact in connection with this trade, is that the most elegant garments placed on the market this season, are manufactured in Toronto. In fact these Canadian made goods are equal in every respect to any imported from either Berlin, Paris or London. The styles are all that could be desired, the materials and trimmings elegant and first-class in every respect, and the mechanical execution equal to custom work. Many ladies, when wearing these Canadian made garments, are under the impression that they are imported from Europe.

OUR reciprocity plan includes only the countries whose products are unlike our own. Canada labors under the disadvantage that the bulk of her products are similar to ours. It is hard to see just why we should trade evenly with Canada in food materials if we consider it wise to refuse to trade evenly with England in manufactured materials. It is not good policy for this nation to help to enrich Canada while that country is a British dependency.—*Philadelphia Manufacturer*.

It is the greatest folly for the Grit party to be constantly urging upon Canada to plead for any sort of reciprocity with the United States. We say "any sort," because Canada will never consent to sacrifice her manufacturers and their interests, and Americans are constantly telling us that there would be no benefit to them to trade evenly with us in natural products which are similar to theirs. If Canada is wise she will maintain her dignity and advance her interests by holding off, and let the propositions for reciprocity come from the other side. The better to do this Canada should McKinleyize her tariff upon American manufactures. The tariff as it is is good enough for our trade with Britain and the rest of the world. The United States will not trade even with Britain in manufactured products, but it seeks to force that sort of a trade upon us. If Canada imposed a McKinley tariff upon American manufactures, we might be persuaded to reduce it to the old standard for a consideration. Business is business. It is distressing to observe how the American Eagle is afflicted with insomnia and night sweats at the idea of the British Lion being a favored and abiding guest in Canada.

THE writer conversed the other day with a furniture manufacturer, who, a few years ago, employed seventy-six hands. Now he employs thirteen all told, and to save his capital he is reducing stock and means to get out of business. He said the N.P. had drawn too much capital into the trade. He can make as good furniture as ever, but the market is not large enough for himself and the rest. His men must go to the States or find some other employment in Canada. The furniture trade is overdone, and the duties upon raw material do not help it. —Hamilton, Ont., *Times*.

This is a deserved and expressive compliment to the National Policy. A few years ago the N.P. enabled this man to go into business, and his success was so great that he gave employment to seventy-six hands. The same inducement influenced other men to engage in the same business; and the most of these men are now so successfully engaged in their business that they have neither time nor inclination to grumble. Successful men don't grumble. Probably this man who, at one time, employed seventy-six hands, but now only thirteen, still has the same machinery and appliances in use in his factory as he had in the long ago; while his more active and enterprising competitors have been abundantly rewarded by abandoning obsolete methods and "catching on" to new and valuable wrinkles as they appear. The N.P. is all right. Instead of having to import furniture, as was the case before the N.P. came into force, and paying whatever foreign manufacturers might be pleased to charge, we now have furniture factories in abundance and furniture is very cheap; in fact so cheap, just as the N.P. intended it should be, that the old fogy laggards are being forced out of the race.

THE CANADIAN MANUFACTURER, of Toronto, reprints a paragraph from these columns in which we commented upon its opposition to the introduction into the Dominion of the pauper and criminal children which are sent over every little while by the English and Scotch philanthropists. We hinted that the perfervid loyalty of our Canadian neighbors ought to enable them to receive these flattering attentions from the "goody-goody" home bodies in a proper spirit of thankfulness, for it is well known that England regards her Canadian vassal as only good enough for cast-offs, whether in the line of politicians or anything else. Our contemporary says with spirit: "Perfervid loyalty" be hanged. Canada does not intend to be made a dumping-ground for the paupers of other countries, whether they come from England or not. Leastwise, not if vigorous kicking can prevent it." There seems good cause for "kicking" over the border just now. We hope Canada will kick lustily and purge herself of the high politicians who have disgraced her, when she has settled the infant pauper immigrant question, if not before. We indulge the hope, also, that our cold-blooded neighbors will some day become so proficient in the high-kicking art that they will disentangle themselves from the yoke which they at present bear, and accept Uncle Sam's proposition to "hitch."—*American Artisan*.

We are under many and enduring obligations to our Chicago contemporary for the interest it takes in Canadian political morality, and we venture to assure it that Canadian justice is of a quality which is a terror to evil-doers. The rascals are being turned out, and they will be punished as they deserve—that is if they do not succeed in escaping to Chicago. Meantime we will continue to kick against the deportation of the offscouring of the slums of London to Canada; but any high kicking that we may do will not be to "disentangle" this country from its connection with Britain. The old flag is good enough for us, and we have no desire to see it pulled

down to give place to that of an unfriendly people. When Uncle Sam's proposition to "hitch" is emphasized in the way it is, illustrated by offensive and unfriendly tariff legislation, Miss Canada stands upon her dignity and rejects the offer.

SIR ADOLPHE CARON, the Minister of Militia and Defense, recently introduced a bill in the House of Commons providing that whenever the Canadian Militia may be called out by the civil authorities in any local emergencies, a deposit of money sufficient to support the militia so called out for eight days, shall be made by the district which they are called upon to protect, and at the expiration of the eight days, a further deposit shall be required for the next eight days, and so on. In unorganized districts, the Lieutenant-Governor should make the deposit; and the Governor-General could authorize the calling out of the militia without the deposit. The stupendous absurdity of such a law could only be equalled by the disastrous effects which might possibly result from it. The law now gives the local magistrates the power to call upon the military to assist in preserving order. If the average magistrates of a county are not men of sufficient judgment for an emergency, they should be set aside and proper men appointed. Does the Minister propose to have militia colonels located in every neighborhood with authority to demand the deposit, when a riot may be in progress, and lives and property imperilled, refusing to allow the strong arm to be used until a messenger could be sent to the bank to cash a cheque? If a community is responsible for the expense incurred in calling out the militia to quell or prevent a riot, the debt might be collected afterwards; but it is silly to suggest that a fund of money should be kept within reach at all times for that purpose. According to the Minister's idea, the fire department of a city would be justified in refusing to pump water upon a burning building until the expense of doing so was arranged with the chief. If the Minister desires to prevent the calling out of the militia in emergencies, let him ask to have the militia disbanded. But if that were done, the Minister would be out of a job—*functus officio*, as it were.

AN American free trade journal says:

Very few, even among the best educated in manufacturing technology, would imagine that there was any direct industrial or commercial relation between the tin plate industry of the United States under the protective clauses of the McKinley Bill and the palm oil industry of the west coast of Africa. Yet such a relationship is a fact, and we find in English journals that the "palm oil market in Liverpool has become seriously disorganized in consequence of the crisis in the Welsh tin industry." The Welsh tin industry is "seriously disorganized in turn by the enforcement of the prohibitory tariff imposed by McKinley on the people for the benefit of a few foreign monopolies settled in this country and having "infloence" in politics. Palm oil and tallow are used in great quantities as a high temperature bath in one of the stages of the process of a sheet of iron toward finished tin plate. The *Chemist and Druggist* of a late date, commenting on the condition of the palm oil trade, very truly and justly says: "The effects of this particular clause of Mr. McKinley's act thus extend from the palm oil pressers of Yoruba at one end, via the Lagos and Liverpool oil merchants, the Welsh tin plate shippers, and the New York importers, to the salmon and fruit canners of the Pacific states, with ramifications affecting the Lancashire cotton spinner, the Welsh workman, and the

shipping interest generally. What better proof could be desired of the nefarious effects of raising artificial barriers to trade?

The trouble with these free traders is that they are too cosmopolitan in their ideas. In the United States they are not Americans—in Canada they are not Canadians as much as they are anything else. Saint Paul tells us that the man who provideth not for his own household rejecteth the faith and is worse than an infidel. Nations are but aggregations of families of which their Governments are the heads; and according to this doctrine of Saint Paul the duty of Government is to protect the families of the nation by preventing the unfair competition of other people. In the matter alluded to by our American contemporary none of the materials of the tin plate industry are indigenous to Wales, and the same influence that gave it importance in that country can give it importance in another country—in the United States for instance, where the largest proportion of the article is consumed. The American Government when forcing the tin plate trade to locate in the United States were obeying Saint Paul's injunction. If the palm oil pressers of Yoruba find their shipments to Liverpool becoming unprofitable, let them transfer them to New York. There can be no nefarious raising of artificial barriers to trade in the United States encouraging the manufacture of tin plate in that country whereto plate is in the greatest demand.

OUR esteemed contemporary, the Philadelphia *Manufacturer*, says that the recent transfer of the Japan mails from that country to Great Britain via the Canadian Pacific steamers and railway, is a remarkable achievement which has more interest for Americans than appears upon the surface. It alludes to the fact that much the larger part of the journey of the letter bags from Japan was performed upon transportation lines heavily subsidized by the British and Canadian Governments, and that the transcontinental movement was made upon the Canadian Pacific Railroad, "built chiefly with public money, built to steal our trade, and operated to-day within American territory in defiance of our interstate commerce law." It tells us, further, that "the plain indications now are that harm will be done to American trade by the enterprise referred to"—that already great quantities of imports to the United States from the East come by the British route, largely because the American lines cannot compete on even terms with the subsidized British lines, and that England is likely by such means to increase her already "unfair" share of Japanese trade. The nervousness and excitability of our usually level-headed friend destroy its equanimity and cause it to talk nonsense. We suggest to it that if the Canadian and British Governments see proper to subsidize our trans-pacific steamers, and if the Canadian Pacific Railroad was built chiefly with public money, it is no earthly concern of either the American people or the American Government. That Government are free to build railroads and subsidize steamship lines to their heart's content and no other Government or people would have any right to object; and it is very certain that neither Canada nor Great Britain will be deterred from doing the same thing when they desire to do so. For years our contemporary has been constantly, in season and out of season, urging upon the United States Government to inaugurate a system whereby by subsidies and

other encouragements the Stars and Stripes would again appear upon the ocean, but the wisdom of that Government does not develop in that direction: but this is no reason why Canada and Great Britain should not pursue this course. The *Manufacturer's* complaint that the Canadian Pacific Railroad was built to "steal" American trade, and that it is operated to-day within American territory in defiance of the interstate commerce law is just too funny for anything. It is a confession of weakness and inability that indicates that that law is of such a faulty character that the courts in that country decline to enforce it, or that it is so unpopular with the American people that they will not allow it to be enforced. Or perhaps—and this is most likely to be the case—there has been no violation of the law. If general sentiment in the United States were as hostile to Canada as that of the *Manufacturer* appears to be; if the interstate commerce law was being violated by the Canadian Pacific Railroad, and if the law is constitutional, there should be no trouble in punishing the contumacy of this bugbear Canadian road: but it should be remembered that the commercial interests of Philadelphia and New York are not those of the whole country, and that New England on the one hand, and Minnesota and the grain growing states of the West on the other, have deep interests in the cheap transportation of merchandise which they would not enjoy were it not for the Canadian Pacific Railroad. This is clearly a case of very sour grapes.

## SPECIAL ADVERTISEMENTS.

*Advertisements will be accepted for this location at the rate of two cents a word for the first insertion, and one cent for each subsequent insertion. Subscription \$1.*

"TRIUMPH OF THE AGE." Attention is called to the advertisement of The Eno Steam Generator Company, Limited, on page 227 of this issue. This Generator is being adopted by the leading manufacturers in Canada and the United States. Every steam user should investigate its merits.

J. L. O. VIDAL & SON, City of Quebec, are agents to sell and handle on commission all sorts of new and second-hand machinery, engines, boilers, pumps, agricultural implements belting, hose, safes, saws, files, bolts, machines and tools for shoe factories, etc. Consignments solicited. Best references given.

THE HEESON IMPROVED SHAKING FURNACE GRATE has no equal for all kinds of furnaces, round or square, boilers heating furnaces, ovens and stoves. It is the only grate that will clean fires without opening fire doors. It is the strongest bar known, having the most air space, thus securing better combustion. These bars are saving more fuel and generating more steam and will last longer than any other bars on the market. Ten per cent. saving in fuel guaranteed or no sale. References on application. HEESON GRATE BAR Co., 38 King St. East, Toronto.

FOR SALE, A VALUABLE CANADIAN PATENT.—The Trenchholm Improved Perpetual Hay Press, patented 1882, has been manufactured in New Brunswick for nine years, and stands without a rival in the Maritime Provinces. As it has not been

introduced in the Upper Provinces, the purchaser can, if he manufactures there, get practically a complete control of the business in Canada, as this machine is cheaper, stronger, easier running and more durable than any other Press of its class, and is well protected by patent. Full investigation invited. Terms easy. Write for particulars to A. J. TRENHOLM, Sussex, N.B.

THE New York *Electrical World* of Sept. 19th, is claimed by the publishers to be the largest number of an electrical journal ever published. It contains the full report of the recent Montreal convention, and consists of one hundred pages. Everyone interested in the electrical business will find the many important and valuable papers and discussions by prominent electricians of much permanent advantage in business, and the report should be carefully read. The *Electrical World* is noted for its ability, enterprise, independence and honesty; and for thoroughness, candor and progressiveness it is in the forefront of special journalism. It may be ordered of any newsdealer at ten cents a copy, or it will be mailed free to any address in Canada or the United States for \$3.00 per year.

OCCULAR evidence that the building of General Grant's monument at Claremont, New York City, has been begun at last, is furnished in *The Illustrated American*, which publishes in the current issue, illustrations showing the character of the work in progress. The subject of fox-hunting is pictured by means of instantaneous photographs taken at a meet of the Meadow Brook Hounds on Long Island, and some of the tableaux recently given at Newport for the benefit of a charity are reproduced. Among dramatic matter is an illustrated view of the play, "The Dancing Girl," and a handsome portrait of Helen Bertram, the singer, is given. An account of Mme. Récamier appears in the series of "Beauties of Bygone Days." "Christian's Marriage" is the title of a short story. As a colored supplement there is presented a sketch of a clown, by Arthur Jule Goodman.

*Railway Law and Legislation*, a national weekly magazine of information and discussion regarding law, litigation, decisions, legislation, and political, social, financial and economic movements and developments affecting common carriers. Washington, D.C. Conducted by Wm. P. Canaday and G. B. West. The initial number of this valuable publication, bearing date September 7th, has reached this office through the courtesy of Col. Canaday. The first article is devoted to a discussion of the Nicaragua canal project, in which a concise history of that great undertaking is given; and a more important article to Canadians is that upon Canadian competition and discrimination, in which the imbroglio into which the Canadian Pacific Railway has plunged the Interstate Commerce Commission is very ably discussed. Col. Canaday was for a number of years Sergeant-at-Arms of the United States Senate, and proved himself to be one of the most popular and efficient officers of that august assemblage.

*The Illustrated World's Fair*, of Chicago, is a high-class illustrated journal, the special object of which is to enlighten the world regarding the progress of the World's Columbian Exposition, which is to open in Chicago next year, illustrating its every phase and feature, and making a complete encyclopædia, profusely illustrated, of what is claimed will be the greatest exposition ever known. The illustrated departments, judging from the several copies which have already reached us, will be of the greatest interest to scientists, scholars, artists, and men, women and children generally. The people of Chicago and of the United States generally, have subscribed millions of dollars to this World's Fair enterprise; the government of the United States have appropriated other millions of dollars to ensure its success, and Great Britain and most all of the nations of Europe, and of the world, will participate. Of course everyone who can do so will attend the Fair, but whether they go or not, the reliable account of the doings to eventuate there, and a correct representation of the buildings, grounds, things and notable persons, will be furnished in the beautiful journal here alluded to.

*Good Housekeeping* is one of the most welcome of the monthlies, because of its diversity of matter, and the wide range of interests which are treated in its columns. It caters especially to the housewife and the children, but even the man of affairs finds subjects in which he is concerned that are embraced within its scope. Still, it treats principally of the home life; and there could be no more important topic, since upon the home depends the nation. *Good Housekeeping* is commended to all who would make the Home attractive, whether by its fittings and adornments, its ministrations to the palate and stomach, or its attractions for the

social side of human nature. The October number has an unusually rich and varied table of contents. It has as a frontispiece a beautiful poem, "Twice a Child," illustrated with an engraving of a waterfall; then follow articles on the morning work in the kitchen, by Miss Parloa, on the care of the skin, on life in a city flat, on company giving and receiving, with something about living on one's friends—these being mentioned simply to show the range of topics which find treatment in the pages of this excellent guide and assistant for the household. Clark W. Bryan & Co., publishers, Springfield, Mass.

*The Illustrated American* for the week ending September 26th, contains an article, interesting alike in text and illustrations on the recent aggressive movements made by Russia. The illustrations include views of the Dardanelles, Bosphorus, Constantinople and Cabul; portraits of the Czar and the diplomatists and generals who have been engaged in carrying out Russia's ever-grasping policy, and also one of Alikhanoff, the famous Russian adventurer recently arrested in disguise at Cabul on suspicion of being a spy. The scandal over the sale of decorations which led the late Jules Grévy to resign the presidency of the French Republic, is related and is illustrated with portraits of the principal persons concerned. A peep into the literary sphere, the existence of which is not generally suspected, is afforded in an article on "Amateur Journalism," and what may be seen in a two hours visit to the Tower of London is presented with pen and camera. Two pages that will attract general attention are devoted to the case of Mrs. Maybrick, the American woman sentenced in England to imprisonment for life on a charge of poisoning her husband. It is shown that there is at least sufficient doubt of her guilt to entitle her to a new trial, if not to her freedom. A portrait of George William Curtis, printed in colors, forms a supplement to the number.

"MR. BEECHER as I Knew Him" is an attractive title, and under it Mrs. Henry Ward Beecher begins her series of personal reminiscences of her husband in the October *Ladies' Home Journal*. In a delightfully frank manner she tells of her first meeting with Mr. Beecher and how he looked; their courtship and engagement; how he earned his engagement ring; his first sermon, and early religious beliefs. The October *Journal* is absolutely crowded with good things. Major McKinley has his wife sketched for the first time in print, with portrait, in the series of "Unknown Wives of Well-known Men"; the domestic tendencies of New York's social leaders are described in "Society Women as Housekeepers"; Henry Clews, the New York banker, tells about "The Making and Saving of Money"; Maria Parloa starts her new domestic department, as does Foster Coates his boys' page; Ella Wheeler Wilcox discusses "Social Slave Markets"; Susan Coolidge, Mrs. A. D. T. Whitney and Kate Tannatt Woods each have a story; "To Entertain Evening Parties" is treated fully by six writers; Talmage writes very happily, and altogether the October *Journal* is the strongest number ever issued of this marvellous periodical which has now reached a circulation of 700,000 copies each month. One dollar a year, or ten cents a single number. Published in Philadelphia, by the Curtis Publishing Company.

*Wile Awake* for October has a pleasure in store for the young lovers of English literature in the form of a narrative called "The Maidens of the Lakes," they being the young daughters of the three lake poets, Dorothy Wordsworth, Edith Southey, and Sara Coleridge, lovely girly, to whom Wadsworth addressed his poem, "The Triad;" there are portraits of the three girls in early womanhood, and views of their homes and favorite haunts; the article is by Miss C. H. Garland. There are two long articles for those who enjoy natural history, "Bee-Hunting," by Rowland E. Robinson, and "The Trouble Grandpa Nature had with the Horse," by L. J. Bates; also a shorter and very curious one, "The Joint Snake." There are three stories, "Edith's Guinea-Pig," by Esther George, "Jessie's Chickens," by Hattie Tyng Griswold, and "A Night with Russian Wolves," by Lieut.-Col. Thorndike, whose titles smack of animal life, but all three are stories of human nature. Two interesting folk-tales are given, the Norse story of "Why the Sea is Salt," and the Moqui account of "The Genesis of the Earth and Moon." Margaret Sidney's Peppers Serial is intensely interesting this month, but although one number more brings the story to an end, this "end" is not to be guessed by the readers. "Marietta's Good Times" deals with a monkey theater "Miss Matilda Archangeau Van Dorn" does credit to herself and her ancestors, though her immediate relations were sometimes of a contrary opinion. "Men and Things" is full of good original anecdotes, and there are many readable poems and enjoyable pictures. \$2.40 a year. D. Lothrop Company, Boston.

THE nineteenth volume of *Outing* opens with the October issue, and never has a finer number left the presses. If the standard of

the coming volume is to be gauged by the initial number, readers of this excellent magazine have a rare treat in store for them, for such number and beauty of illustrations and wealth of interesting reading are seldom found between two covers. The contents are: "Saddle and Sentiment," by Wenono Gilman; "Harry's Career at Yale" (continued), by John Seymour Wood; "Field Trial Winners in 1890," by Edwin H. Morris; "Deer Stalking in the Indian Territory," by Francis J. Hagan; "A Study in Black," by Clarence B. Moore; "Yacht Clubs of the East," by Capt. A. J. Kennealy; "Mississippi National Guard," by Lieut. R. K. Evans, U.S.A.; "Goose Shooting in the Sacramento Valley," by "Parson"; "The Rose Tree Hunt Club," by Alfred Stoddart; "Ripples and Paddle Plashes," by E. Pauline Johnson; "How We Ride Our Wheels," by Grace E. Denison; "The Running Broad Jump," by Malcolm W. Ford; "Horseback Sketches," by Jessie F. O'Donnell; Mackerel and Mackerel Seines," by Jno. Z. Rogers; "The Last Wild Horse of the Kanab Desert," by "Honda"; "Obeying the Poet," by Marion Hill; "Early Morning on the Prairie," by E. Bernard Foote; "Recent Football at Harvard," by "A. Long-drop"; "Upper Peninsula Runways," by Ed. W. Sandys, and the usual editorials, poems, and records by the standard writers on sport, etc. Three well-known Canadians are contributors in this number. In "How We Ride Our Wheels," Grace E. Denison points out the value of cycling as an exercise for women, and valiantly champions the cause of common sense and the right of the sisterhood to possess wheels. From the banks of the lovely Grand river, E. Pauline Johnson, true to her Mohawk ancestors, sends a delightful story of a cruise—"Ripples and Paddle Plashes," and in "Upper Peninsula Runways," Ed. W. Sandys tells of rattling good sport in the dark woodlands west of the "Soo."

CARROLL D. WRIGHT, U.S. Commissioner of Labor, opens the October *Popular Science Monthly* with the first of a series of "Lessons from the Census," in which he traces the growth of the census, and shows that it has come to be a somewhat unwieldy instrument. Mr. W. F. Durfee, in the series on American Industries, gives the history of "The Manufacture of Steel," from colonial times to the introduction of the Bessemer process. The article is copiously illustrated. Under the title, "Metamorphoses in Education," Prof. A. E. Dolbear traces the necessary connection between the new character which human life has taken on and the rise of scientific education. Prof. G. T. W. Patrick discusses "The Rivalry of the Higher Senses," and shows that man is becoming less "ear-minded" and more and more "eye-minded." In "Exercise for Elderly People," Dr. Fernand Lagrange tells what sort of exertion should be chosen and what avoided by persons who have passed their prime. "Life on an Ostrich Farm" is described in a very bright and instructive way, with several helpful pictures. The second paper of Prof. Frederick Starr's notable series on "Dress and Adornment" is in this number. It deals with the origin and many of the varieties of dress, and is fully illustrated. Lieutenant-Colonel A. B. Ellis, writing on "Polyandry," shows how the former existence of this practice is indicated by the prevalence of marital customs that grow out of it. G. Maspero tells what has been learned, from mummies, paintings and inscriptions, about "The Dogs of Ancient Egypt." The work done by Astronomical Societies and Amateur Astronomers is dealt with by L. Niesten. There is a pleasant and very reasonable article on spiders—"The Spinning Sisterhood," as they are called by the writer, Mrs. Olive Thorne Miller. M. Pierre Bonnier treats of "Hearing in the Lower Animals," and there are a sketch and portrait of John Winthrop, one of the ablest among the Harvard professors in the times just before the Revolution. In the Editor's Table are an examination of Herbert Spencer's latest book on Justice, and a sketch of the work done in the School of Applied Ethics, at Plymouth, during the past summer. New York: D. Appleton & Company. Fifty cents a number, \$5 a year.

AN American contemporary says:—"Gradually the cultivation of the beet is becoming of primary importance on the coast. The Western Beet Sugar Company, founded and managed by Claus Spreckels and his sons, will, at their Watsonville sugaria, begin the season's campaign on September 15th. The capacity of the establishment is 350 tons per day. They propose to use 30,000 of beets, which will approximately yield 3,600 tons of sugar. The Alameda Beet Sugar Company will have a capacity of 250 tons per day. They will draw their supplies from 1,000 acres planted in beets, but they want the product of 2,000 acres. The product will be approximately fifteen to twenty tons of beets and from them one and a half to two tons per acre in sugar. This will give, at the lowest computation, 1,500 tons of sugar.

## THE ST. CLAIR TUNNEL.

THE St. Clair tunnel has been constructed under the river of that name, at the foot of Lake Huron, for the purpose of superseding the ferry boats which have hitherto conveyed the trains of the Grand Trunk route across the river. It will afford immense advantages to passengers, and for freight traffic in avoiding the inconveniences of a ferry, in saving two hours of time, and in shortening the distance of about six miles.

The actual tunnel itself under the river is 6,026 feet long. It is lined throughout with solid cast-iron plates, bolted together in segments—each segment being five feet long, eighteen inches wide and two inches thick, with flanges five inches deep; the whole lining weighing 28,000 tons. The bolts and nuts for connecting the segments together weigh 2,000,000 pounds. The permanent way through the tunnel is laid with steel rails, weighing one hundred pounds to the lineal yard. The interior diameter of the tunnel is twenty feet, and ample means have been provided for thorough ventilation, and for lighting it throughout when required by the electric light. The road is practically level under the river, which approaches at each end on gradients of 1 in 50. The total length of the tunnel and approaches is 11,553 feet. At the ends of the approaches are junctions with the Grand Trunk Railway on the Canadian side, and the Chicago and Grand Trunk railroad on the American side of the river. In connection with these junctions ample ground has been levelled and prepared, and shunting sidings to the extent of ten miles have already been laid on each side of the river.

The tunnel was constructed by means of heavy wrought iron shields, with sharp edges, fifteen feet three inches long, and twenty-one feet six inches in diameter. Each shield was pushed forward by twenty-four hydraulic rams, the barrel of each ram being eight inches in diameter, with a stroke of little more than eighteen inches. Each ram exercised a force of 125 tons.

It is believed that the route, as thus improved, will offer facilities for thorough communication between Chicago and all points in the east, which will be appreciated by passengers and freighters. There will be no more trouble from ice-blocks or other obstructions in the river, and the best time will be made for traffic of all descriptions.

From the date when the shields were first lowered in position at the portals, to the meeting of the shields in the tunnel, the time occupied in constructing the tunnel was twelve months. The cost of the tunnel proper was \$1,460,000.

## CURVED ARMS IN PULLEYS

Is there any good reason why the antiquated designs of pulleys and fly wheels, discarded so long since by progressive machine manufacturers, should still be adhered to in many large, as well as smaller, establishments? Are there any mechanical principles involved, theoretical or practical, or both, which would suggest the necessity or advantage of making curved instead of straight arms to support the rims? And, admitting that there were good and valid reasons for the adoption of this design in the past, does not the fact that the best practice of to-day prescribes straight arms suggest that those reasons no longer exist? If we analyze the functions of the different members of a pulley, it would not appear difficult to ascertain the simplest form of device which would enable us most effectively to meet the requirements. But there are other considerations involved besides the mere matter of efficiency. Difficulties in the construction of machines frequently necessitate modifications in design, and the original and probably the only object in curving the arms of cast-iron wheels was of this nature. The variable shrinkage of hub, arms and rims, where straight radial arms were used, caused severe and even dangerous strains, resulting either in fracture of the casting while cooling or liability to serious accident while in use. As this unequal contraction was the result of improper manipulation in moulding, pouring and cooling, so a better understanding of the requirements has enabled the founder to obviate the difficulty, and thereby the necessity for meeting it.

The strains to which a pulley wheel is subjected, though of an exceedingly complex nature, need only be considered with reference to the most important. In every revolution of the wheel these strains pass through a complete cycle of changes, ultimately amounting to an entire reversal. But as each can be considered and provided for independently of the others, this prevents any complications of the problem. For instance, in the rim there is the compression strain, due to the pressure of the belt on the arched surface with which it comes in contact. And operating against the compression and to a certain extent neutralizing it is the tensile strain from the centrifugal force due to its periphery speed. On



the opposite side of the face, however, the compression is entirely absent, and therefore the full tensile strain is effective. As at ordinary speed this is very much less than the pressure of the belt, it is not necessary to consider it, but at a high rotative velocity it becomes the most important, and therefore in designing the pulley the tensile strength of the iron must be very carefully calculated. In either case, the compression and tensile strains, considered with reference to their effect on the arms—also the traverse strain caused by the torsional function of transmitting or receiving power, or in case of a mere fly wheel in overcoming inertia and maintaining the speed of its heavy rim—are the factors in the problem. If the arms were designed to give the maximum degree of strength and stiffness possible for the amount of metal they contained, it would be necessary to take into account whether the pulley were to act as driver or driven, and in that case the arms would not be radial, but tangential to the hub, so as to perform the function of a rigid column supporting the load due to belt strain on the rim in a line perpendicular to the compound strain due to pressure and torsion. But as in practice it is generally desirable to have pulleys of uniform pattern for either driver or driven, it is necessary to adopt a form of arms which will answer equally well for either purpose—i.e., a mean between the two, which would be radial. This gives a direct columnar resistance to the belt pressure, and with the pulley at rest is the strongest form. But as soon as the power is applied the torsional strain from the belt produces an additional set of conditions, and the arms assume also the function of a beam fixed at one end and loaded at the other. Considering these two functions with reference to curved arms, we find, as regards the first, that it is analogous to a loaded column of the same form. One of the fundamental principles of construction is that the centre of gravity and its load shall be as nearly as possible in the central axis of the column throughout its length. If it were curved like a pulley arm or even slightly, as sometimes happens from warping or unequal shrinkage, the column would be at once rejected. A stone or brick arch carrying its load on the crown is one of the strongest forms of construction, but if it were placed on end and the load applied vertically it would be one of the weakest. Considered as an overhung beam the curvature adds to the length, and therefore reduces the transverse strength in proportion to the increase in length.

A straight radial arm of proper cross section gives a perfect column and the shortest possible length of beam, consequently it is best adapted to meet the requirements where it is desired to use the wheel indiscriminately to run in either direction; or if it be desired to use it for one specific purpose only, then a straight tangential arm will most directly support the strain when the pulley is in motion, and will be proportionately weaker when at rest under the radially compressive strain from the belt tension. Aside from functional considerations, and from a purely economic standpoint, the straight arm is cheaper both in cost of pattern, cost of moulding and weight of metal. As to symmetry, there can hardly be a question that the straight arm has the advantage. Is there any good reason then, for continuing the use of curved arms?

#### A WONDERFUL NEW ALLOY.

A PITTSBURGH, PENN., man named Harrington, according to the *Dispatch* of that city, is the inventor of a wonderful new metal or alloy. The process in the manufacture of bronze, crucible and open-hearth nickle-steel and an improved carbon bronze.

Mr. Harrington is well known as the patentee of carbon bronze. He has devoted years of study to the compounds possible through the assimilation of various metals, and after much patient labor has at length developed a metal which is entirely new in metallurgy. To this he has given the name of the "Harrington Manganese Bronze." The metal is of a bright reddish gold color. Mr. Harrington says that its constituents include copper, zinc, tin, etc., but he refuses, of course, to say what the "etcetera" stands for. The chief characteristics of the new metal are that it obtains a very high tensile strength; is indestructible by corrosion, being impervious to acids, and that it can be wrought into spikes, nails, etc., while either hot or cold.

Mr. Harrington showed a *Dispatch* reporter some fine shavings of the metal immersed in pure sulphuric acid. They had been in the acid for five weeks without losing bulk or changing color. Ordinary bronze will dissolve in eight hours is subjected to such a test.

James L. Morgan & Son, manufacturers of caustic soda in New York, placed a sample of the metal in boiling oil of vitrol for six weeks without its losing weight or changing structure. R. H.

Thurston, professor of metallurgy at Cornwall University, and the Government expert in testing metals, examined a specimen of this metal. He found the testile strength to be 75,000 pounds to the square inch; the breaking load, 91,000; transverse test, 98,000, and the crushing strain, 128,000 pounds to the square inch. Herefore, the strongest bronze ever made under manipulation, which Harrington's was not, was found by Prof. Thurston to have a testile strength of 69,986 pounds. The piece of metal used in the transverse test was tried by Dr. C. H. Dudley, the Pennsylvania railroad chemist at Altoona. He broke the piece into two and tested each as follows: No. 1.—Testile strength 73,000 pounds; elongation 19 per cent. No. 2.—Testile strength 74,000 pounds; elongation 16 per cent. Dr. Dudley, in referring to the metal, said: "Chemically, the metal is an alloy of copper, tin, zinc and iron. There is a little doubt as to whether all the metal put down as tin is tin, but we have not succeeded in finding anything else. It will be noted by comparing the analysis with the principal test that the metal is a very wonderful one."

The most interesting, and at the same time, most extraordinary physical test to which the metal has been subjected, occurred at the Etna Tube Works. The piece of metal had been fused, cast in sand, and afterwards bored into a pipe 12 inches long, one-eighth of an inch thick, and one-sixteenth of an inch in diameter. This was the manipulation it received. It was placed in the hydraulic testing machine used for testing the tubes made by the firm. Here it may be stated that steel tubes for oil-well purposes are tested up to 1,500 pounds pressure to the square inch, and iron pipes up to 1,000 pounds. When the power was applied the gauge showed a pressure of 1,500, 1,600, 1,700, and up to 1,900 pounds, to the astonishment of the operator, who betrayed fear at proceeding farther, as the machine began to leak. Foreman John Kearns then took hold of it, and the test proceeded. The press spouted water and locks were employed to keep it from drenching the bystanders. The gauge crept up to 2,200 pounds pressure, and at this point the test was discontinued, as the machine began to discharge water in all directions. Mr. Kearns stated he felt confident that if the machine could have accomplished it, the pipe would have withstood a pressure of 3,000 pounds to the square inch.

A very severe test of the acid-resisting properties of this extraordinary metal was made at the Standard Oil Co.'s refinery at Lawrenceville. The oil of vitrol used in the process of refining cuts away the best bronze to be had in a few weeks. Three weeks is the longest service which an agitator cock has yet given. A cock made by Mr. Harrington from his metal was fixed in place July 15th, and it was working on Saturday last and as intact as when put in. Superintendent Williams said yesterday he saw no reason why it should not work three months longer.

Further tests of metal which had undergone manipulation showed a testile strength of 69,000 pounds; percentage of elongation, 21½; reduction in area, 14 per cent. These were made by Messrs. Hunt & Clapp. Castings of the metal exhibited a testile strength of 65,820 pounds, which is nearly 5,000 pounds more than the greatest strength of other bronzes after manipulation.

The discoverer of this metal said yesterday in connection with it: "The metal is much stronger when hot than cold—in this respect following steel. Bronzes, or the compositions of bronzes, the best of them, lose their cohesion in from 400° to 500° Fahrenheit, while the new metal, up to 1,000° or 1,200° becomes stronger, making it a very valuable metal. It will work by rolling or forging, either hot or cold; will roll into sheets or draw into wire, seamless tubes, etc. It is easily worked under a file, showing a fine finish and susceptibility of high polish. Being easily forged, it is useful for bridge or dam building, and can be made into bolts or spike, like iron or steel. It should be very suitable for submarine uses, as it will not corrode. With all these advantages it is no more expensive than the ordinary commercial bronzes, and there is no especial selection of materials used in the compound."

It is difficult to say what services this new compound may not be requisitioned to perform. Its resistance to acids and corrosion will make it useful for propellers which, made of steel or brass, are corroded by the sea water and, rotting, finally break.

The attention of the Government being drawn to this metal, Commander W. M. Fowler, of the Bureau of Ordnance, instructed Lieutenant Cowles, the naval inspector at Homestead, to inquire into the matter. He did so, and has made an exhaustive report to the bureau on the subject.

Mr. Harrington says he will not take out a patent on his process, but will maintain it as a trade secret.

Mr. Harrington's process for making nickle-steel is no less interesting than his manganese bronze. He exhibited a razor, yesterday, made from a piece of nickle-steel. It has been used by a barber in the Anderson on a customer. The barber stropped it before be-

gining operations, and he finished off the man without again using the strop. This barber said "it was as fine a piece of steel as he ever had in his hand." It was subsequently used on another man without being stropped, and satisfactorily. This piece of steel was made from ordinary spring steel stock whose tensile strength runs from 60,000 to 68,000 pounds, with an addition of 2½ per cent. of nickel. Previous to being made into a razor it had been severely tested in the Westinghouse electric shops as a turning tool. It worked in the latter four days without requiring sharpening, and when taken out the edge was intact.

The process used by Harrington in the alloy of nickel and steel is the only one, so far as known, in which refined nickel is used. The metal is also American. All other manufacturers use either nickel matte or ferro nickel. In nickel matte there is copper, iron, and nearly always cobalt. When the matte is used these minerals are present, and consequently the percentage of nickel used must necessarily fluctuate and remain an unknown quantity until an analysis has been made.

According to Mr. Harrington, the secret of making nickel-steel is to overcome the porosity. He claims to do this and to make a perfectly homogeneous alloy. The difficulty in the manufacture arises from the fact that nickel and steel are, to a certain extent, incompatible. They have an affinity, and may be mixed, but owing to the nickel being so liable to porosity, in casting it is difficult to combine the two metals and overcoming that tendency. This is where Mr. Harrington's secret lies. He had added 2½ per cent. of nickel to ordinary spring steel of 60,000 pound tensile strength, and a test showed the strength of the alloy to be 153,350 pounds. He said yesterday he could make alloys of from one to 25 per cent. of nickel of complete homogeneity, solid, and free from porosity. The fact that a piece of the alloy was made into a keen bladed razor supports this statement.

THE PRODUCTION OF ALUMINUM.

FROM the Census Office a bulletin relative to the production of aluminum has been issued. The following is given in this bulletin concerning the output of that metal in the United States:—

In the last decade the electro-metallurgical processes for obtaining aluminum have become favorite subjects for patents with inventors. It is sufficient to describe briefly the two which have been commercially successful in this country, and they will serve as types of all. The earlier of these, the Cowles process, was established in 1885, and is carried on by the Cowles Electric Smelting and Aluminum Company at Lockport, N. Y. It is at present (1890) confined to the production of aluminum alloys, viz., aluminum bronze (and brass) and ferro-aluminum. This was the pioneer of such processes in the United States, and created an industry which has since been developed and extended. This process, which is now well known to persons interested in metallurgy, consists in passing the current from a powerful dynamo through a mixture of alumina (in the form of corundum, bauxite, etc.), carbon and pieces of copper contained in a suitable vessel lined with carbon, through the ends of which vessel the large terminals of the dynamo are inserted. The mixture is arranged so as to prevent short-circuiting. On passing the current the alumina is reduced in the presence of carbon, and unites with the molten copper to form an alloy rich in aluminum. This alloy is afterward remelted, and enough copper added to it to reduce the aluminum contents to the proportions desired for aluminum alloys of the required grades.

The Cowles Company have produced aluminum bronze as follows:

PRODUCT OF ALUMINUM BRONZE.

YEARS.	POUNDS.	VALUE.
1885.....	4,000 to 5,000	\$1,000 to \$2,000
1886.....	50,000	20,000
1887.....	144,764	57,000

Besides alumina bronze the Cowles Company make ferro-aluminum by the same process by which the bronze is made, substituting iron for copper. The alloy, containing from five to ten per cent. of aluminum, is used as a vehicle for introducing aluminum into molten iron to increase its tensile strength and solidity. An idea of the growing demand for ferro-aluminum for this metallurgical use is obtained from the statement of the Cowles Company, that they made in 1886 from 2,000 to 3,000 pounds, valued at from \$780 to \$1,170, and in 1887 42,617 pounds, valued at \$16,621. The total aluminum alloys produced in 1889 was 171,759 pounds.

Many proposals have been made and many patents obtained for making alloys of aluminum with iron and sometimes with copper, by reducing alumina with carbon in the presence of fluxes and the metals. Clay, kaolin and other compounds of alumina, it is asserted,

may be used for this purpose. Sometimes the iron or copper is added to the melted mixture used as a "bath"; sometimes the mixture is added as a flux to iron in a cupola or similar furnace, and sometimes it is used as a paste on iron, which is then heated. The object in most cases is to make an iron aluminum alloy for "beneficiating" iron. The announcement of the good effect produced on iron by adding minute quantities of aluminum to it while melted, and Mr. Keep's experiments on this subject have probably led inventors to patent processes of the above kind. It is to be regretted that these processes do not yet offer clear and certain evidence that they are distinct and decided improvements like the electrical processes, or, indeed, that they are operative in the manner described. The Herault process, which, like the Cowles, makes aluminum alloys, had not been put into commercial operation in this country up to the close of the census year.

In the United States the extraction of aluminum itself is also effected by dynamo electricity, and is a new industry carried on by the Pittsburgh Reduction Company, at Pittsburgh, Pa., operating under the patents of C. M. Hall. The process consists in forming a fused bath of the fluorides of aluminum, calcium and sodium, to which calcium chloride is subsequently added, by melting a mixture of cryolite, aluminum fluoride and fluorspar in a suitable vessel lined with carbon, adding alumina thereto, and then separating the aluminum by the current from a dynamo, the carbon electrodes of which dip into the bath. The process is continuous, because the alumina is renewed as it becomes exhausted. One merit of the process is that the fused bath is of less specific gravity than the aluminum set free, which therefore sinks to the bottom of the vessel. If alloys are desired the negative electrode is formed of the metal which it is desired to alloy with aluminum. Variations of the composition of the bath are described in the different patent specifications, but that above given is believed to be the one used in practice. This Company produced 19,200 pounds of aluminum in 1889, which was sold at \$2 per pound in quantity. The total production of aluminum in the United States during 1889, including that contained in alloys, was 47,468 pounds, with a total value of \$97,335.

A HINT TO CAPITALISTS.

THIS is certainly an age of scientific progress. It would be a superfluous task to enter upon a trite recapitulation of the wonderful discoveries that give this generation pre-eminence over all its predecessors, but an interesting enumeration might perhaps be made of the unfinished schemes now in progress or under serious advisement for wresting from nature still more of her hidden mysteries. Thus, while one set of philosophers are experimenting with the surrounding atmosphere, hoping to obtain a mastery over the moisture suspended in the clouds, or to gain control of the electrical currents supposed to be coursing through the ether, others are turning their minds and efforts downward toward the centre of the globe we inhabit.

During the last two sessions of Congress there has been serious discussion of a Government appropriation for boring a hole in the earth several miles in depth. It has long been recognized that an inconceivable amount of value in the shape of metals and mineral substances is locked up out of reach beneath the crust of this planet. All the riches dug out of it represent merely the most superficial and ineffective scratching of the surface. Geologists are agreed that the interior of the earth is largely composed of metals. Whereas the surface matter of the planet weighs only about 2½ times as much as water, it is known as a fact that towards the centre the average weight of things is eleven times that of water. This is due to the circumstance that while this sublunary orb was cooling and condensing, the heavier particles sought the middle. Therefore it is probable that the great mass of the sphere is iron.

But there are other metals more heavy than iron, and these would naturally form an accumulation immediately about the centre of the globe. So it is not unreasonable that certain members of Congress and other persons of keen judgment should consider the advisability of boring a hole in the earth for the purpose of extracting some of its metallic contents. For scientific purposes a pit has recently been sunk at Spelling, in Germany, to the depth of a mile. Unfortunately water has been struck, and no results which add very materially to human knowledge have thus far been obtained. Another well has been driven at Wheeling, W. Va., as far down as three-quarters of a mile. It is dry, and the boring process is proceeding at the rate of about ten feet a day. Estimate is made that at twenty miles from the surface of the earth every known substance—metals, rocks and all—becomes fused and liquid.

Once let the point be reached, and naturally whatever is below must spout up of its own accord, without expense of mining.

Immediately the price of metals in the market would be reduced to little or nothing, and a new age would dawn upon civilization. It has been suggested that such an artificial conduit would be, to all intents and purposes, a volcano; but any dangers which it would otherwise threaten might be obviated easily by establishing the work on an open prairie.—*American Analyst.*

## 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. Subscription \$1.*

MR. P. BOISE will erect an oil mill at Nanaimo, B.C.

THE Bean Thresher Company will locate their works in Galt, Ont.

MR. R. RODGERS will erect a large grain elevator at Clearwater, Man.

DAVIS's woolen mill at Harriston, Ont., was destroyed by fire September 22.

A 50,000 bushel grain elevator is to be built immediately at Brandon, Man.

AN extensive mine of mica of the finest quality has been discovered near Argenteuil, Que.

HILLIARD's shingle mill at Peterboro, Ont., was destroyed by fire, Sept. 21st: loss about \$2,500.

THE London Organ Company is being organized in London, Ont. for the manufacture of musical instruments.

MR. GEORGE WORKMAN has started a factory at Streetsville, Ont., for the manufacture of cardigan jackets.

THERE are now six grain elevators at Neepawa, Man., which have a combined storage capacity of 200,000 bushels.

THE cheesebox factory of Henry Redden, at Campbellford, Ont., was destroyed by fire, Sept. 30th; loss about \$600.

HOEGG's canning factory at Fredericton, N.B., which is now giving employment to a hundred hands, is to be lighted with electricity.

THE Cornwall Manufacturing Company, Cornwall, Ont., have recently put some new and important machinery into their factory.

MR. TERRASSON DE RERARDINE has been voted a bonus of \$25,000, and will establish an extensive knitting factory at Roxton Falls, Que.

MR. BUCK, late of Farnham, Que., is starting a mill at St. John's, Que., with twenty-five machines, for the manufacture of hosiery, mitts, etc.

MESSRS. SMITH & BRIGHAM, Mosomin, Man., are preparing to build a 30,000 bushel grain elevator to be operated in connection with their flour mill.

A COMPANY has been organized at Truro, N.S., with a capital stock of \$100,000 to manufacture peptinized porter. Mr. J. E. Fitch is managing director.

THE Western Milling Company, Regina, N.W.T., have contracted for the erection of a large flour mill at that place, the construction of which will be pushed vigorously.

THE Kingsley Boiler Works, St. John, N.B., have recently been enlarged by the addition of a boiler shop 100 x 40 feet, other improvements being in anticipation.

THE lumber mill of the St. Lawrence Company Bathurst, N.B., was destroyed by fire Sept. 23; loss about \$20,000. This was one of the largest mills in New Brunswick.

A NEW factory for the manufacture of upholsterers' tow is being built at Plum Coulee, Man., to replace the one which was nearly destroyed by fire recently. It will be operated by steam power.

MR. H. R. FOOTE, shipbuilder, Victoria, B.C., is building a steamer for the San Juan Fishing Company, the boilers and machinery for which are being built by the John Doty Engine Company, Toronto.

MESSRS. R. FORBES & Co., manufacturers of woollens, etc., Hespeler, Ont., find it difficult to obtain all the help they require in addition to the 180 men employed there. This mill is to be lighted by electricity.

MR. C. T. HEISEL, who is proprietor of a large chewing gum factory, at Cleveland, Ohio, is erecting a branch factory in Toronto, which will give employment to thirty-five hands, and be under the management of Mr. S. T. Britten.

A VERY large ship was launched a few days ago from the shipyard of Mr. Joseph Monteith at Maitland, N.S. She is called *Earnscliffe*, and registers 1,875 tons. Her length of keel is 228 feet, breadth of beam forty-three feet, and depth of hole twenty-four feet.

THE Royal Pulp Company, East Angus, Que., are introducing into their new pulp mills there four large turbine waterwheels, manufactured for them at Owen Sound, Ont., the weight of which amounts to twenty-eight tons, and the gearing, shafting, pulleys, etc., to fifteen tons.

THE new iron works of Messrs. Waring, White & Co., St. John, N.B., include a brick machine shop, 83 x 52 feet, foundry, 70 x 50 feet, with annex, 40 x 10 feet; pattern shop, 40 x 30 feet; pattern store room, 30 x 30 feet; casting shop, 30 x 20 feet, and blacksmith shop, 20 x 20 feet, besides coal sheds and other necessary out-buildings.

THE scheme by which the Patterson & Corbin Company, of St. Catharines, Ont., were expected to erect their street car works at Peterborough, Ont., has fallen through, and the company will probably remain in St. Catharines. Meantime there seems to be a prospect of a company being formed in Peterborough to engage in that business.

THERE are said to be but three concerns in Canada at this time engaged in the manufacture of worsted yarns: the R. Forbes Co., Hespeler, Ont.; McCrae & Co., Guelph, Ont., and Dixon Bros., Dundas, Ont. The Quebec Worsted Company, city of Quebec, were engaged in the manufacture of those yarns until the disastrous boiler explosion destroyed their works some months ago. The Paton Manufacturing Company are now erecting a mill at Sherbrooke, Que., which will be employed in this industry.

MR. ROBT. TURNBULL, of the Goldie & McCulloch Company, leaves Thursday for Victoria, B.C., to superintend the setting up of the mammoth 600 h. p. Wheelock engine, which the company have manufactured for the Electric Light and Tramway Company, of Victoria. To give our readers an idea of the size of this engine, we learn that the fly-wheel measures eighteen feet in diameter, and the face four and a half feet. The wheel weighs some twenty tons.—Galt, Ont., *Reformer*.

MESSRS. BRODIE & Co., of the Hespeler Woolen Mills, Hespeler, Ont., have sold out their cotton manufacturing branch to the Dominion Cotton Mills Company, of Montreal. The machinery is to be removed in October, and will probably be placed in one or more of the other mills owned by the syndicate. The woolen department of the Brodie mill is running full blast, and the establishment is at present doing night work to keep up with orders. The card room runs night and day, and the whole factory employs about 300 hands.

J. A. HUMPHREY & SON's woolen mills now gives employment to fifty-seven hands as compared with about thirty-five or forty last year. The lower flat of the new brick building, 35 by 105, has been partly filled with new machinery, and is now actively in operation. New looms, spinning machines, etc., have been added, enabling the firm to turn out a finer class of goods than ever before. Quite a large village has sprang up in the vicinity, and more houses will be needed next spring to accommodate the people.—Moncton, N.B., *Times*.

MESSRS. JAMES PENDER & Co., St. John, N.B., are making important additions to their iron works, included in which are two buildings, one 155 x 50 feet and one 124 x 50 feet, one to be used as a wire mill and wire nail mill, the other for forging horse nails, machine shop, warehouse, etc. There will also be a new engine house, boiler house, blacksmith shop, etc. These buildings will all be one storey high, of brick, on heavy stone foundations, and will cover an area of 35,000 square feet. These improvements will be ready for occupancy during the coming winter.

A LONDON despatch says that, owing to the depression in the iron trade, the operations at many of the principal iron works in the Cumberland district have been suspended for some time past. Six thousand men were thrown out of employment by the stoppage of the works, and a large number have earned nothing for a year. Hundreds are on the verge of starvation, and so serious has the situation become that the authorities have decided to start public works to give employment to many idle men in the district and thus avert the famine threatened.

THE Polson's Iron Works Company have recently closed contracts for the construction of two more steamers, to be built at their

works at Owen Sound, Ont., in addition to the Government fishery cruiser recently alluded to in these pages, and which is now being built. These are for another Government cruiser, and for a steamship for Messrs. E. D. MacKay & Co., of Hamilton, Ont. This latter vessel will be 179 feet long, thirty-two feet six inches beam and thirteen feet deep. She will be composite wooden bottom with steel frames and metal top sides. This additional work at this important industry will give steady employment to the company's staff here all through the winter months.

THE discovery of new deposits of anthracite coal in the Province of Alberta, comprising a portion of what was formerly known as the Northwest Territory of the Dominion of Canada, will prove, if the reports are correct, highly important not only to Manitoba and British Columbia, but also to the Pacific Coast states of this country, there being no import duty on anthracite coal. It is said that large seams of this coal have been found along the Red Deer river, forty miles north of Banff. Hitherto it has been supposed that the only anthracite coal in Canada was at Anthracite, near Banff, from which place the present supply for the western part of the Dominion is taken.—*New York Engineering and Mining Journal.*

THE New Glasgow Iron, Coal and Railroad Company, of New Glasgow, N.S., are having a new coke blast furnace built for them at Ferrona, N.S., by Messrs. Stein & Schwartz, of Philadelphia, Penna. This furnace will be fifteen and a half feet in diameter at the bosh by sixty-five feet in height. It will be equipped with all the modern appliances, including three fire-brick stoves. The builders expect to complete the furnace by April next, and will have the management of it for one year. The New Glasgow company owns good mines of iron ore, coal and limestone within thirteen miles of the furnace, with which they are connected by a railroad owned by the company. At the coal mines the company has a coal-washing plant, with a capacity of 200 tons in ten hours, built on the Schuechtermann & Kremer plan. The coke plant consists of a battery of Belgian retort ovens, with machine discharge of the Bernard system.

MR. A. P. BRAYTON, president of the Pelton Water Wheel Company, New York City, who has recently returned from Europe, brings back with him a specimen of the Ferranti cable used by the London Electric Supply Company in the operation of a station in that city from which large powers are supplied. The cable is designed to carry 5,000 horse power at a pressure of 10,000 volts. Mr. Ferranti is said to have secured a concession from the Canadian Government to utilize the Canadian side of Niagara Falls for the purpose of producing electric power. It is proposed to take the water from above the Falls and discharge it below, thus obtaining about 150 feet fall. For this purpose the Pelton Water Wheel Company will, if necessary, furnish a wheel capable of developing 5,000 horse power. Mr. Ferranti expects to use dynamos of 2,500 horse power capacity, and the Pelton Company will furnish wheels of 5,000 horse power—two of 2,500 horse power each, connected directly with the shaft of each dynamo. The works will start with a capacity of 20,000 horse power, necessitating the use of eight water-wheels. The Ferranti Company propose to build a very extensive power station at the Falls, as by the use of their cable they will be able to transmit large powers at long distances at comparatively small expense.

It has been stated that the oldest hat factory in Canada is that of C. & E. Everett, of St. John, N.B. It may be the oldest existing factory, but it is not the first hat factory started in Canada. About the year 1815, a hat factory existed in York (Toronto), in Upper Canada, conducted by a firm named Rogers & Stockings—the first named, we understand, being the father of Messrs. Joseph and J. H. Rogers, furriers, of Toronto. In the year 1817 they had a branch house at Niagara, then the capital and the most important town in the Province. The old *Niagara Spectator* of January, 1817, contained this advertisement of the firm: "Rogers & Stockings respectfully inform the inhabitants of this town and its vicinity that they have just received from their factory at York an extensive assortment of hats, consisting of beavers, castor, napt Rorams [whatever they were] and merino wool, with ladies' jockeys of beaver, etc., which they warrant to be of the first quality, and which they can afford to sell at the most reasonable prices, either by wholesale or retail, for cash." After returning the customary thanks for "past favors," they conclude: "Cash paid for hatting and shipping furs; likewise for hatters' wool delivered at their store near Alexander Rogers' hotel." In those days a beaver hat was really made from beaver fur, but the process of manufacture has so changed that the term "beaver hat" is itself almost obsolete. Only Canadians of the generation now passing away call a silk hat a beaver; and it is only in the garret of some country house that a specimen of the genuine old beaver head-piece is to be found—and ludicrous

now it seems with its broad flat brim, wide round top and shaggy sides. Its more refined successor, the silk hat, shows a wonderful longevity when we consider the frequent and radical changes of fashion in other respects. Curious are some of the reasons put forward to account for it; but, no doubt, the silk hat will go some day, and will be as great a curiosity to future generations as the beaver is now. When the genesis of bald heads comes to be thoroughly understood, the silk hat and the heavy hard felt will both depart. For winter wear in a country like this, either the fur hat or the old French-Canadian tuque is the only philosophical heat; and for summer wear, the light helmet, or an improved turban, is the proper hygienic head gear, if men must have a hat for hot weather at all. We maintain that fashion should have some respect for its geographical whereabouts, and not bind the world in one arbitrary chain from the equator to "the realms of the boreal pole." If each zone had its own fashion, the inhabitants thereof would be healthier and happier, and it is a comfort to know that there are signs of such a millennium in modes.—*Journal of Fabrics.*

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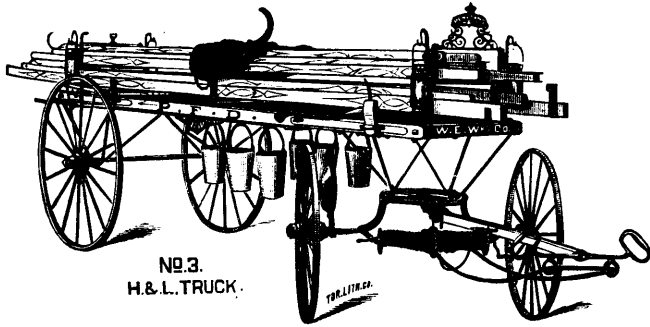
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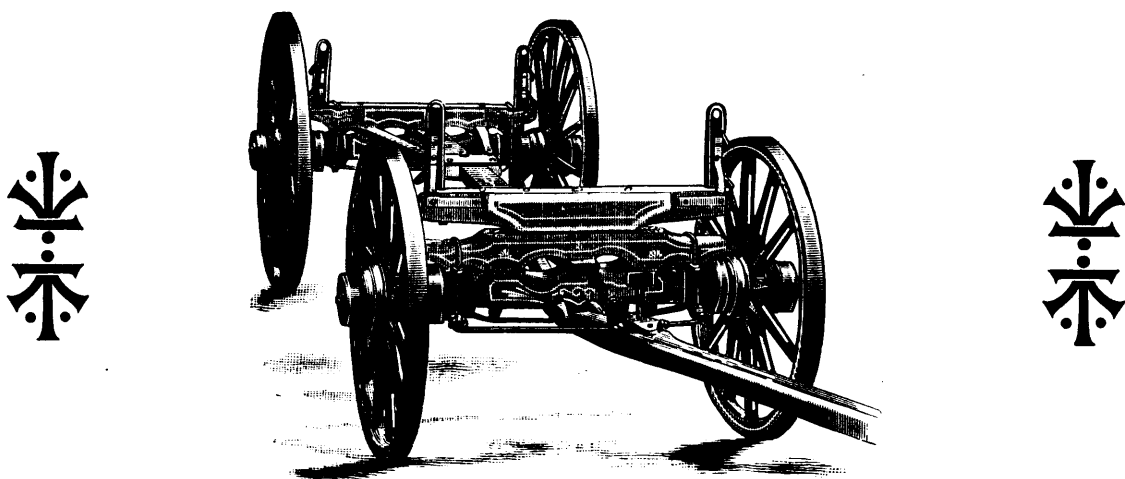
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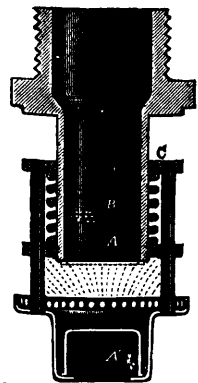
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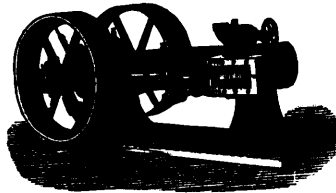
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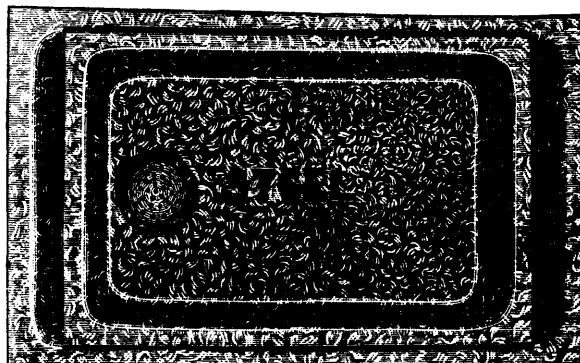
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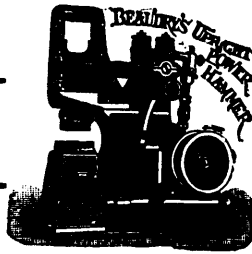
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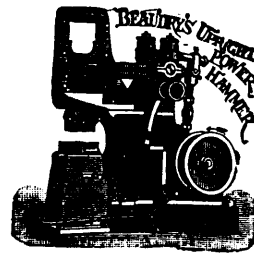
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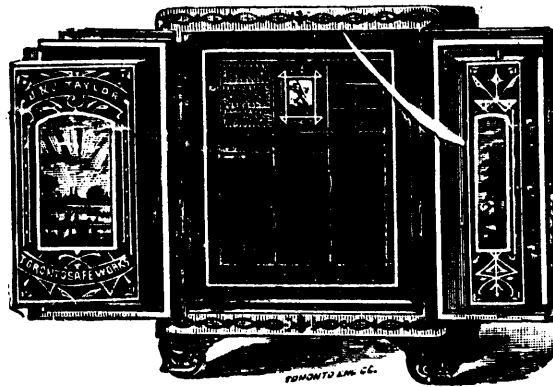


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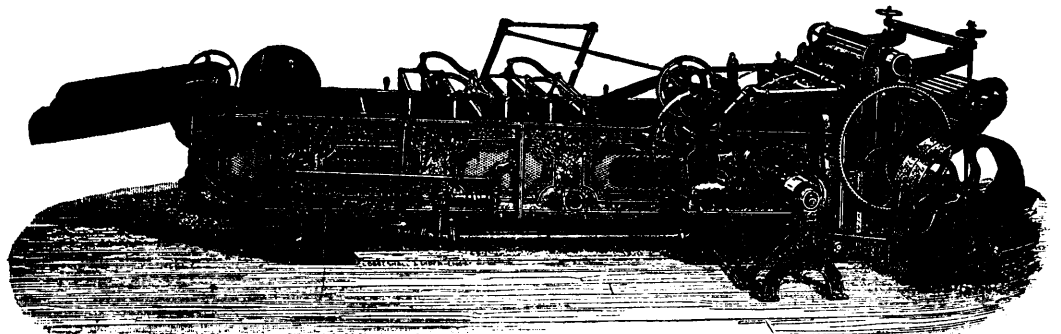
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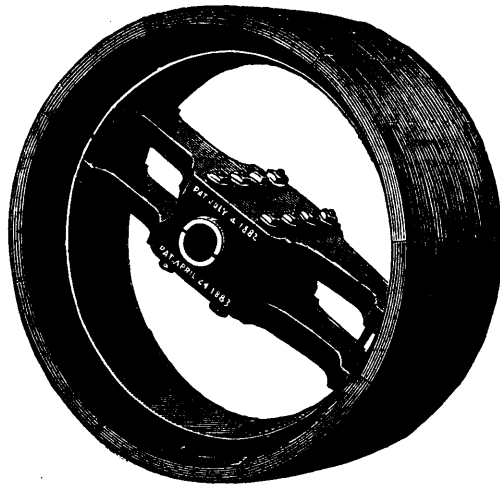
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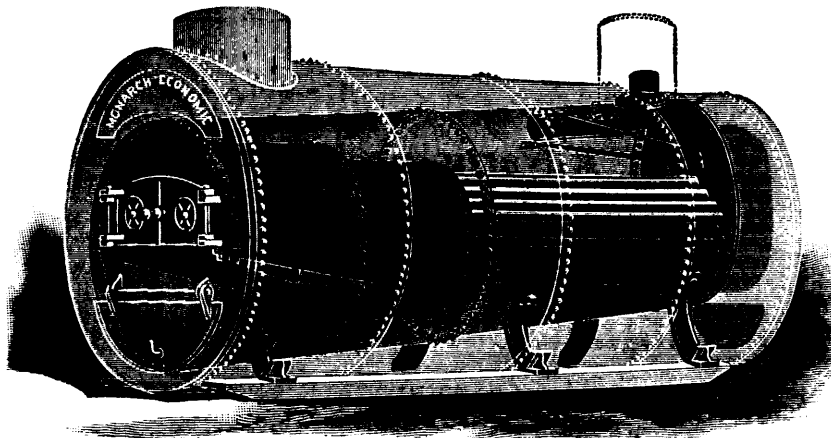
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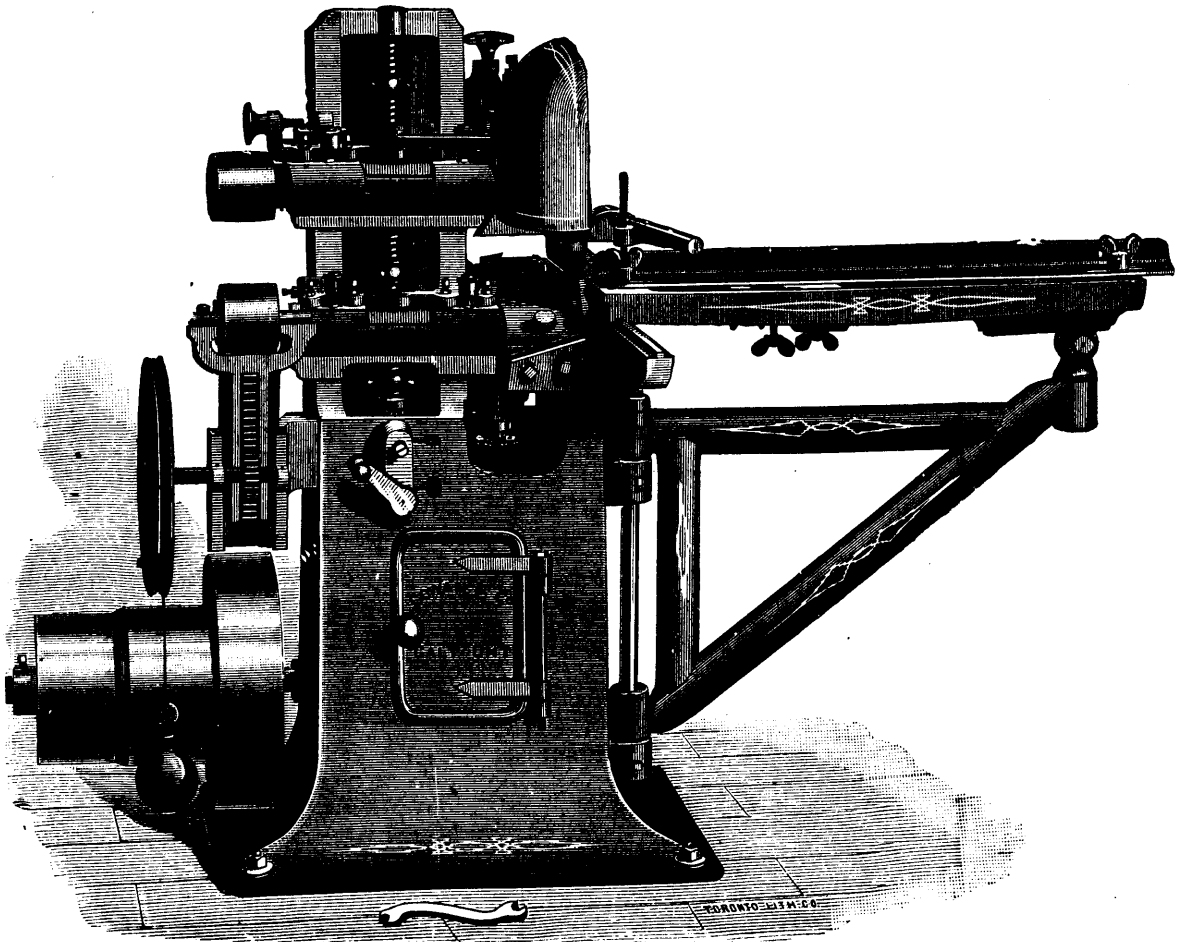
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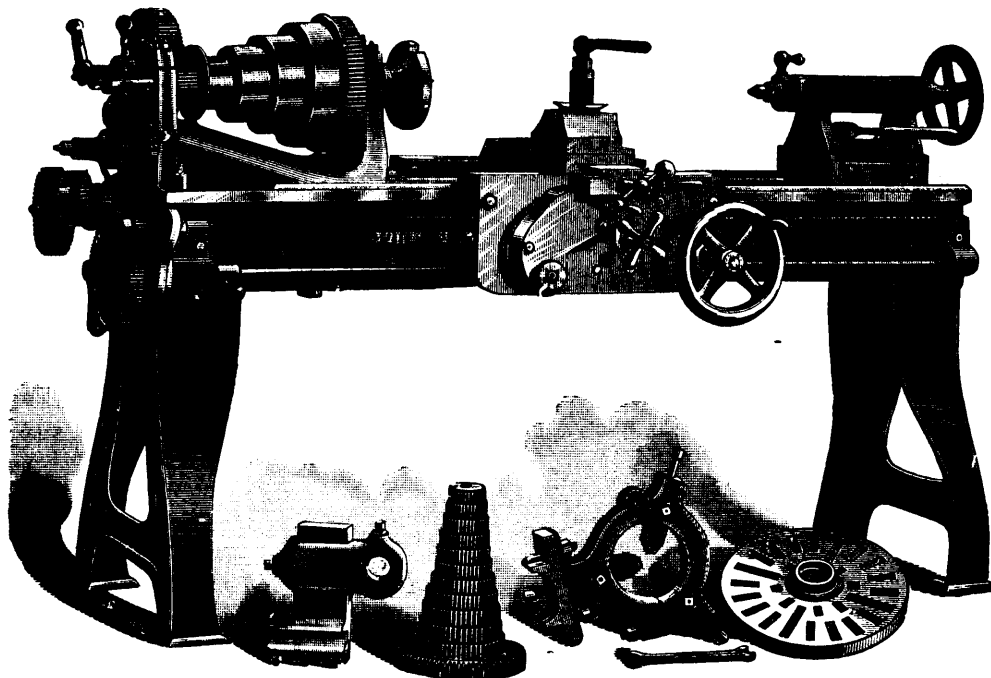
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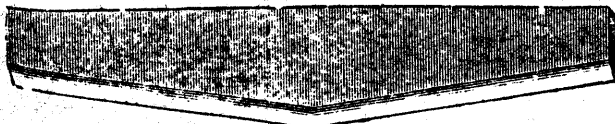
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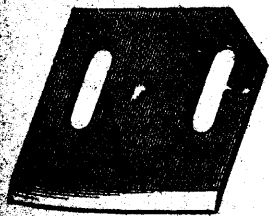


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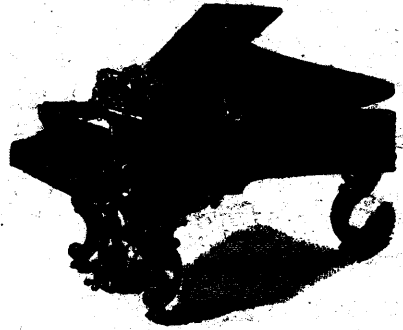


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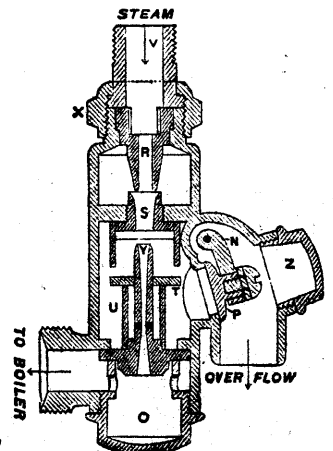
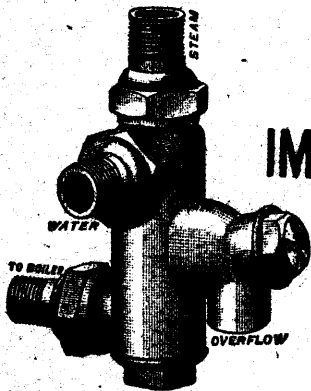
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