

Technical and Bibliographic Notes / Notes techniques et bibliographiques

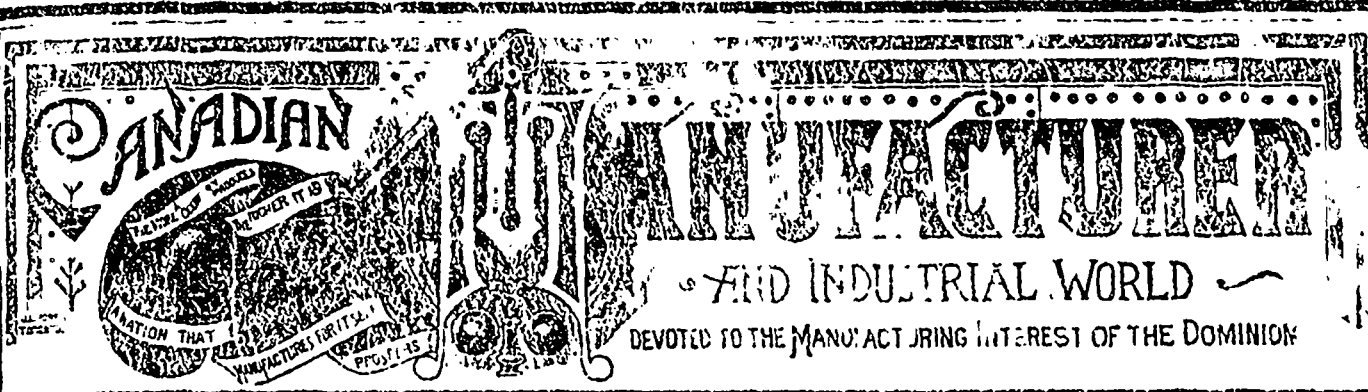
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TORONTO, MARCH 17, 1893

No. 1.

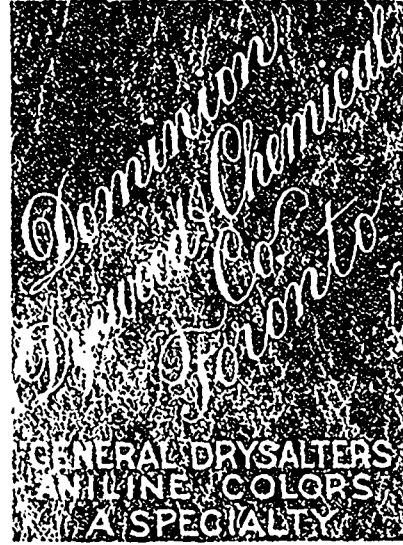
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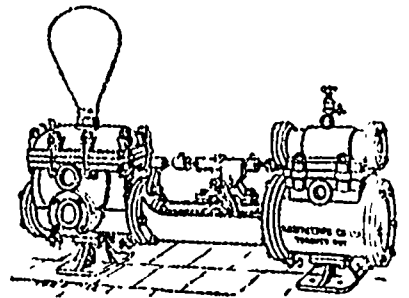
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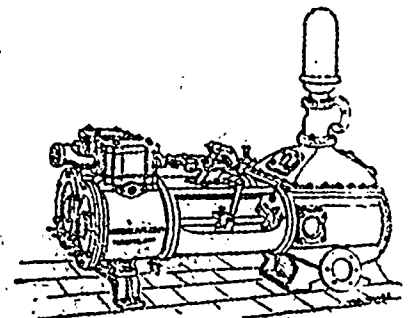
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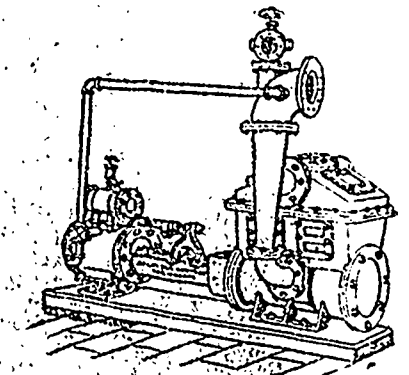


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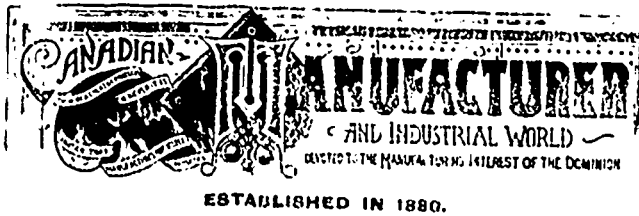
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AS TO ROLLED IRON.

RECENT articles in this journal re the manufacture of rolled iron in Canada have excited considerable comment, a part of which is embodied in a communication to be found in another page. The writer, who is interested in an iron industry, agrees with us that Sir Charles Tupper made a mistake when he imposed a duty of only \$2 per ton on wrought scrap iron, our correspondent's opinion being that to make the iron schedule harmonious the duty on that article should be considerably increased.

He is mistaken, however, in supposing that really excellent rolled iron cannot be made entirely of scrap. We are informed by experts that most excellent iron can be made from scrap alone; and that even in making puddled iron it is desirable to incorporate a certain proportion of good scrap. Thus in the manufacture of heavy forgings, such as locomotive frames, etc., the general practice is to use only the best selected scrap, and whatever impurities there may be in the article are expelled to a large extent in the process of hammering.

What we have heretofore said regarding the inferior quality of iron made in Canada had reference not to hammered iron, but to bars and rods—merchant iron—entering into general consumption. As our correspondent points out, in the manufacture of such iron it is practically impossible to prevent the presence among the scrap of such foreign substances as small pieces of brass, steel, etc., and it is such things worked up with the iron scrap that causes an inferior product very unreliable for many purposes. Under any circumstances it is not economy to use an inferior article, and this fact is as pointed out important in the use of iron as in anything else. Common cut nails, for instance, is as cheap a form of iron as enters into general use, but it is not economical to use nails made of very poor iron, simply because they are unreliable and in many instances valueless, or worse. It is not economy to use inferior iron in the manufacture of a trace chain or a knag bolt to a wagon. It will probably fail to serve its purpose just at a time when strength is required. If, then, poor iron is so objectionable for such minor purposes, how much more important is it that it should be of the very best quality when required for railroad work, building bridges, etc., where the lives of human beings are at stake. The breaking of a coupling pin, or link, or brake rod, because of imperfections of the iron, has frequently been the cause of the death or mutilation of many people and the destruction of valuable property.

Regarding the rolled iron made in Canada, we know that for the more important uses to which such iron is put the home-made article is not utilized. The makers of it cannot claim that it is equal to similar iron made of muck or puddled iron; and no railroads in Canada when having bridges built but what specify for a quality of iron which Canadian mills do not make.

In our last issue we showed that our imports of wrought scrap in 1892 amounted to 56,543 tons, and of bar iron 7,500 tons. The former indicates but a portion of the demand of the country for bar iron, the product of Canadian rolling mills, the balance of that quality being made from scrap found in the country. The latter indicates the demand for a quality of iron which is not made here, but which is essential in railroad work—bridge building, architectural work, etc., where only the best quality of iron must be used. The capacity of our rolling mills is sufficient to supply the entire demand, and the entire demand would undoubtedly be supplied from them if they produced a really first-class iron.

Why do they not produce a really first-class iron? Simply because the tariff, as it now stands, encourages them not to do so, and because they can make much more money by producing an inferior quality.

It was the desire of Sir John Macdonald and Sir Charles Tupper, and Sir Leonard Tilley, and the other framers of the National Policy, to give Canada an iron industry, by which we mean that it was the desire and intention to stimulate to completion the building of iron furnaces, so that we might become commercially independent of the world in the matter of pig iron. The duty on pig iron might have been made higher, say six or seven dollars per ton, and that would have obviated the necessity of bestowing a bonus upon the home production, but even the lower duty we now have would not very greatly have retarded the development of the industry, if

the duties on other branches, particularly scrap iron, had been harmonious therewith. The incongruity was the result of the obstinateness of Sir Charles Tupper, who, in that matter at least, was only a theorist, and who would not listen to the suggestions of practical men. His idea was that the pig iron duty plus the bounty would be sufficient to establish the blast furnace industry, to do which would require several years, and that in the meantime the wants of the country for rolled iron could be quite promptly and cheaply met by placing a very low duty—\$2 per ton—on wrought scrap. He did not seem to recognize the fact that no blast furnace ever built could produce a single uniform quality of iron only, and that if furnaces were built it should be made possible to utilize every variety of iron that might be produced by them. It costs more to convert pig iron into puddled bars than to roll scrap into merchant iron. In the first instance two processes are required, in the latter but one. With a duty of but \$2 per ton on scrap it should not have been expected that Canadian iron men would erect puddling furnaces when their raw material could be had at much lower cost. If these iron men, then, declined to build puddling furnaces and become consumers of pig iron, where, pray, were the furnace men to find a market for such of their pig iron as could not be used for foundry purposes? Foundry pig is always in demand, but how could the mill iron be disposed of?

Clearly, then, the Government erred in placing the duty on scrap so low; and if we are ever to have blast furnaces and a prosperous pig iron industry the error must be corrected. The duty on muck iron is \$9 per ton, and if that is what it ought to be, and perhaps it is, the duty on all scrap, both wrought and cast, should be the same. If it was we would very soon have blast furnaces enough to supply our entire demand. There would be such a variety of foundry iron produced by them as to meet all the requirements of foundrymen; and there would be an output of mill irons sufficient to manufacture all the puddled bars the railways and all other consumers would require. If this were done the price of merchant iron would not be advanced, for as it now is we import large quantities of bar iron.

The rolling mill men would not favor the change, but it would be of great benefit, not only to all consumers of iron, but to the country at large. The rolling mill men would be forced to erect puddling furnaces, and this would give largely increased employment to labor; and instead of our importing hundreds of thousands of dollars worth of pig, scrap and bar iron every year, the money would be saved to the country, and Canadian capital and Canadian labor find new and profitable employment.

AS TO CANADIAN CEMENT.

In our last issue we alluded to the fact that the Department of Railways and Canals had determined to ignore the use of Canadian-made cement in the construction of the Soulanges Canal, giving the preference to the English article. We understand that this determination was arrived at after tests of all the various kinds of cement had been made under the supervision of the engineer in charge of the work; and as he reported very strongly in favor of the English Portland cement, the Department proposed to adopt his recommendation.

The engineer in charge of the Soulanges Canal is, we are informed, Mr. Thomas Monroe. We are also told that some time prior to the commencement of this work, this gentleman was sent to England by the Dominion Government, to observe how such work was being done in that country, and particularly the Manchester Ship Canal, then in course of construction. Mr. Monroe was the engineer in charge of the Welland Canal enlargement, and in that responsible position had occasion to know, and did know, of the quality and value of the cement that was used in that important work.

We quite fully appreciate the fact that it is the desire as well as the duty of the Government to use only the very best materials in the construction of so important a work as the Soulanges Canal, and that in deciding in such matters great reliance must be placed in the recommendations of the engineers whose business it is to investigate the merits of the articles available for use in the works. But in our opinion it is also the duty of the Government to have some knowledge of what its engineers have previously done in the way of making recommendations; and to know why, if an engineer had previously made a recommendation regarding an article, he should subsequently recommend its rejection, or why he should not again recommend it. In this instance it was within the knowledge of the Department that there were quite a number of concerns in Canada engaged in the manufacture of Portland cement; that Canadian cement had been very extensively used in the construction of canals and other public works, that it had given the utmost satisfaction in such works, and that many of the most eminent Canadian engineers had recommended the use of these Canadian cements. This information was and is within the knowledge of the Department of Railways and Canals, and also that Mr. Monroe, who now recommends the use of a foreign cement in the construction of the Soulanges Canal, when he was engineer in charge of the Welland Canal made a certificate to the effect that during the previous four years about one million bushels of a cement made at Thorold had been used in the construction of that canal then in his charge.

If the manufacture of cement in Canada were a new industry, and the merits of the article unknown and untried, it might be well for the Government to decline using it in the construction of public works. But it is well known that a most excellent cement has been made in Canada for the last fifty years, and that it has been generally accepted by the Government in many of the most important works which have been constructed. Mr. John Page, Chief Engineer of Canals, writing officially from Ottawa relative to a cement manufactured at Thorold, says:—"For the past forty years the cement obtained at Thorold has been used on various extensive public works, and in every instance the result has proved highly satisfactory. It will compare favorably with any natural or artificial cement that I know of." Mr. Thomas Monroe, now engineer in charge of the Soulanges Canal, while engineer in charge of the Welland Canal, wrote:—"During the past four years about one million bushels of Thorold hydraulic cement have been used in the construction of the canal works in my charge. This experience enables me to testify to the excellence of the article." Mr. W. G. Thompson, resident engineer on the Welland Canal, says:—"My tests of the

Thorold hydraulic cement have extended over a period of twenty-eight years, and have been on a large scale, as exemplified in the locks, bridges, culverts and other masonry on the Welland Canal, and that the record, which has been invariably satisfactory, is to be found in examination of the structures. The necessary tearing down of masonry and concrete during the Welland Canal enlargement has afforded abundant evidence of the reliability of the Thorold cement, both in masonry and concrete, and above and under water, and I desire no better cement for the class of work referred to."

These are a few of scores of such letters of prominent and competent engineers, testifying to the excellence of Canadian cements. Many of the most important works in Canada, perhaps a large majority of them, have been constructed with Canadian cement. One of the most important and recently constructed of these works is the St. Clair tunnel, which extends 6,926 feet under the St. Clair River, the cost of which was \$2,700,000, and in the construction of which Canadian cement was used exclusively.

Of course the Government are aware of all these facts; and being aware of them, it is strange that the mere *ipse dixit* of an engineer should be taken as sufficient for the Government to ignore and boycott Canadian cement in favor of a foreign article.

A communication in another page regarding this matter is timely and throws much light upon it.

If it is not too late we hope that the determination arrived at by the Department of Railways and Canals will be re-considered.

HAWAII AND CANADA.

An able contemporary published in Philadelphia, the *Manufacturer*, is one of those journals which has ideas and expresses them. Consistency, however, is not considered essential in presenting its arguments, if some of its utterances may be thus called, and its inconsistency very frequently makes it quite ridiculous.

We are led to this conclusion in reading a couple of editorials in a recent issue of that journal, one of which refers to Hawaii and the other to Canada. Its Hawaiian article champions the cause of the annexationists who desire to bring those islands under the cover of the American flag. It contends that the question concerns nobody but the people of the United States and of the Sandwich Islands—that Great Britain has no rights of any kind in connection with it—that what the British Government think, or desire, or propose, is of no consequence whatever. It tells us "one strong hand has already been laid upon the Hawaiian territory, the hand of the most powerful nation in the world, and the grasp will never be relaxed, nor will there be toleration of any further intrusion." This Bombastes Furioso thus notifies the whole world, and Great Britain in particular, that no interference must be made with the jackal while it is devouring its game. An attempt is made to justify the transaction by showing that the islands are nearer to the shores of the United States than to those of any other country; that they are of greater value to them than to any other people "because the Pacific coast is ours," and to refuse to take the Hawaiian

islands for nothing when they paid \$7,000,000 for Alaska would be unworthy of a nation of imbeciles.

The *Manufacturer's* screed upon "Canadian Expectations" is of similar character. In fact this advocate of national highway robbery becomes a veritable mad bull whenever it sees the colour of the British flag, and when it sees it along the line of its northern border, floating over Canada, it requires a ten-acre lot surrounded by a barbed-wire fence to keep it from devouring the British lion forthwith. No doubt the jackal would be quite as glad to feast upon British lion as upon Sandwich Island Indians, but the lion must be quite dead, you know, before the feasting could be indulged in, and this is what worries the jackal.

The gist of our contemporary's screed against Canada is that whereas the American policy is antagonistic to the enrichment and development of Canada in any manner or by any thing the United States might do, that that country should maintain, if not an active, at least a *quasi* hostile attitude towards Canada. To justify this position it assumes that Great Britain is, and must be, an enemy of the United States; and thus being an enemy, of course Canada, as part of Great Britain, is fit for food for the jackals. Still writhing under the defeat of the Republican party, we are told "There will not be any reluctance in Washington, during the next four years, to treat Canada as a friendly ally rather than as what it is, the dependency of a nation which never loses a chance to deal an ugly blow" at the United States. It further tells us:—

We are confident that the sentiment of the truly American people is steadfastly adverse to the adoption of any policy which will use American instrumentalities to enlarge, enrich and strengthen the Canadian Dominion. The Dominion represents British power upon this continent. The purpose of the rulers of England has long been to try to build up the Dominion so that it could be made the base of military operations against this country in the event of war. The English would rejoice to control a great Empire to the north of us, from which to menace us along a border-line of three thousand miles. The Canadian Pacific railroad was built with public money, with this purpose, and with the further purpose to seize for England part of the Pacific trans-continental trade. At this moment, that railroad is employed to divert traffic from our own roads and from our own steamship lines, and it supplies the funds with which to keep in power in Canada the Tories, who are bitterly hostile to us, who have never ceased to indulge in a policy of nagging and irritation in their dealings with us, and who fully represent the sentiment in the British Islands which regards our greatness and prosperity with mingled feelings of envy and rage.

It is scarcely to be expected that Canada, or Great Britain either for that matter, will put restraints upon themselves simply because the United States does not like to see another powerful nation growing up in such close proximity to her. We know that the American people, without regard to party, look with envious eyes upon Canada, and very much desire to extend the jurisdiction of their government over us. And to accomplish this the spirit of the American people, as exemplified by the Republican party and by such journals as the *Manufacturer*, has been to resort to the means which, for some years past have shown that Government, and its adherents, to be capable of acts of which a Fiji Islander would be ashamed. In their dealings with Canada they seem to forget that the

people of this country are of Anglo-Saxon blood—much more so than they—whose population consists of a very large proportion of ignorant negroes, and, perhaps, a still larger proportion of foreigners gathered from the slums of Europe, and of the very worst description. How silly then, to suppose that Canada could be driven from any position she might assume by any such threats and attempts at intimidation as are being used against her. Those in whose veins flow the pure Anglo-Saxon blood are not of that character.

Some of the methods by which the mongrel-blood American nation expect to wreak a savage revenge upon Great Britain by wresting from her her brightest and most valued jewel—Canada—is thus explained by our contemporary :

The interest of this country, with respect to Canada, is, first of all, to keep Canada poor, and to prevent its growth in population. Second, to stimulate the sentiment of annexation so that the time may come when the Canadians will be eager to unite with us, and to give us control of both shores of the lakes, and of the St. Lawrence from Lake Ontario to the sea. No patriotic American can desire anything less than the complete removal of British authority from a part of this continent which nature has indicated should be within the dominion of the government of the United States. The Republican policy, for four years past, manifestly has tended strongly to the production of these results. The feeling for annexation has developed among the Canadians since the McKinley Bill went into operation more than in the forty years preceding that event. The growth of this sentiment may be estimated from the solitary fact that the Tory Government has thought it necessary to persecute, and to threaten with the penalties of treason, officials who have ventured to favor union with the United States. The McKinley Act worked to this end by denying to Canadians such access to our market as is essential to their commercial success, and by drawing away from Canada thousands of men who prefer the larger chances offered to them in this great country. Any change of these conditions must have the effect to place a check upon the annexation movement, to strengthen the Tories, and to open this large market to Canada without any sufficient compensation to us for our concession.

Our valiant neighbors think it would be an easy thing to annex Hawaii, or rather they hope so, for they are displaying some judicious hesitation in the matter ; and they would be quite precipitate in pouncing upon Canada if it were not for the knowledge that one of the immediate results would be the laying of the city of New York and other of their Atlantic coast cities under the guns of British ships which would not be withdrawn until ample reparation were made. This, perhaps, is the strongest reason our Yankee friends and neighbors have for not for pouncing upon Canada—for not having done it before now—as they would like to do to Hawaii. No doubt the jackal business would be carried on quite as vigorously towards Canada as they would like to carry it on towards Hawaii if it were not for a very wholesome respect for British long range guns. Bombastes Furioso would, doubtless, hesitate before doing so rash a thing as trying to annex the Sandwich Islands ; certainly they can never hope to force the Canadian people into a hatred union with them ; and only idiots could suppose that they could stop or materially retard our march towards national greatness, or to drive us from our attachment to the British flag. If the ties that bind us to Great Britain are ever sundered it will not be through any such instrumentality as the McKinley programme. It may

be “patriotic” on the part of our Yankee neighbors to desire the complete removal of British authority from Canada, but it would be equally patriotic on the part of Canadians to desire the removal of the Yankee flag from Maine or Michigan. Nature, to whom an appeal is made, has indicated one condition quite as strongly as the other. This appealing to nature is very much in the nature of the wolf justifying itself for devouring the lamb.

Stress is laid upon the fact that a feeling for annexation has developed in Canada since the McKinley tariff went into operation, and that because of this fact the Dominion Government have persecuted officials who have favored annexation. If the national honor and integrity are not to be upheld in Canada why should the United States have spent untold wealth and have poured out rivers of blood in putting down the Southern rebellion. Was Jeff Davis a traitor ? Should traitors be punished ? And still the *Manufacturer* approves of and encourages the Government and people of the United States to exert their energies, their influence and their authority to demoralize the country with whom they are at peace with the view to the acquisition of that country.

It is just such exhibitions of unfriendliness as these that make the suggestion of Yankee “statesmanship” to stink in the nostrils of decent, self-respecting Canadians. If President Cleveland is a man of no greater mental capacity than the pigmy Harrison, he is indeed a very small man. If Mr. Harrison is a fair representative of the American people, then that people are a nation of mental pigmies. If Mr. Cleveland is that sort of a man, and if the Harrison methods are to prevail under the new *regime*, the less Canada has to do with him and them the better.

GALL.

ONE of the most sublime exhibitions of gall and impudence that has occurred in Canada for a long while is shown in the following :

“The Toronto University has recently completed the erection of a fine gymnasium building, and are preparing to equip it. With this object in view, several months ago the University authorities invited certain manufacturers of gymnasium furnishings to inspect their building and plans and make estimates as to the cost of the necessary furnishings, this invitation being extended to both Canadian and American manufacturers. When the time arrived for the consideration of these tenders, a certain American concern wired the University authorities that an agent representing them was en route to Toronto with specimens of some of the goods manufactured by them, and requesting that the matter be held open until his arrival. This agent made his appearance in due time before the University authorities, and was so persuasive in his eloquence, that without ever considering the estimates which the agents of the other manufacturers were prepared to present, a bargain was forthwith struck, and an agreement entered into for this American concern to supply the furnishings for the gymnasium. It is very certain that no Canadian manufacturers were considered in the matter, nor was any investigation made into their ability to produce goods equal to the highest standard required for such institutions. The Yankee

steemed to have the matter all his own way from the start. He was desirous of introducing his goods into Canada, especially into such a prominent institution as the Toronto University gymnasium. It would be good advertising for his business, and to effect the arrangement he said he would furnish them at a price actually below cost. He knew that other colleges and schools in Canada would soon be wanting to equip their gymnasiums, private clubs also, and so the contract for the apparatus was awarded to this foreign concern, the home manufacturers not even being allowed an opportunity to compete.

Meantime the equipment was manufactured and shipped to Toronto, where it arrived last month. The University authorities having entirely ignored the Canadian manufacturers and bestowed their patronage upon foreigners, very naturally desired to save a little more money, and this, they hoped, could be effected by inducing the Customs authorities to remit whatever duties the tariff imposes upon such articles: and so a delegation proceeded to Ottawa, and preferred that request, which, we are pleased to say, has not yet been granted.

We have characterized the transaction as an exhibition of gall and impudence. The Toronto University is a very expensive institution, maintained by the Ontario Government for the exclusive use and benefit of wealthy people, for no poor man can afford to even think of availing himself of it for the education of his sons, although his taxes go to keep it up. And to keep up this University gymnasium also. But there are quite a large number of workmen in Ontario employed in the manufacture of gymnasium equipments; and here we see these University authorities depriving tax-paying workmen of occupation, and giving employment to Yankee workmen.

We have knowledge that every article and part of the equipment purchased from the foreign manufacturer for this Toronto University gymnasium could have been supplied from factories here in Toronto; and when it is remembered that the elegant gymnasium of the Athenaeum Club in Toronto, the Jameson Avenue Collegiate Institute and the Harbord Street Collegiate Institute, also in this city, the Montreal High School and other similar institutions are all supplied with Canadian-made equipments, it will be observed that our strictures are deserved.

We do not think the Dominion Government will countenance the insufferable meanness of these Toronto University gymnasium authorities, and allow them to import their furnishings duty free. It would be an injustice and a wrong to do so. And they would do well to keep a watch to prevent the under-valuation of the goods, as we are told is proposed.

RADNOR FORGES.

THE Canada Iron Furnace Company have sent us a beautiful souvenir issued by them to commemorate the visit of the members of the International Mining Convention of 1893, to the Radnor Forges on February 25th last. The book is the production of Mr. George E. Drummond, managing director of the Canada Iron Furnace Company, who are owners of the Radnor Forges; and it contains not only a description of these important works, but also a sketch of the iron industry of that district from its inception, during the reign of Louis Quatorze, down to the present day.

In speaking of his company Mr. Drummond tells us that it was formed in 1889 for acquiring the iron interests of the district of St. Maurice, Que., including the iron works at Radnor Forges, also workmen's houses, limestone quarries, water power, car wheel works, etc., situated there and at Three Rivers, Grandes Piles, the ore deposits at Lac a-la-Tortue and other places.

After operating the antiquated stone stack at Radnor Forges, (the capacity of which was about four and a half tons of pig iron per day), for some two years, in an experimental way, the company proceeded to develop the entire property, including the construction of a modern blast furnace plant, with capacity to produce 40 to 50 tons of high class charcoal pig iron per day. The dimensions of this furnace are:—Height, 40 feet; bosh, 9 feet diameter; crucible, 5 feet diameter; height of bosh line from hearth, 13 feet; and 4 tuyeres $3\frac{1}{2}$ inches diameter each. The hot blast stove is 24 feet long, 18 feet high, and 9 feet 6 inches wide, with 68 openings between combustion chamber and pipe chamber above. There are four steam boilers, each 25 feet long by 4 feet diameter, arranged so as to be fired with either wood or gas. There is also a 24-foot head of water with turbine which affords 65 horse power. The main blowing engine is a "Weimer," 16 x 48 x 30 inches, with auxiliary engines with two cylinders each 40 x 46 inches, arranged to be driven by either steam or water power. Everything else in connection with the works is of the most approved description.

The souvenir contains a large number of letters addressed to the company by manufacturers in different parts of the country who have used the iron made at these forges, and who speak in the highest praise of it. Included in these letters are those from the E. & C. Gurney Company, Toronto; Cowan & Co., Galt, Ont.; St. Thomas Car Wheel Company, St. Thomas, Ont.; Clare Bros. & Co., Preston, Ont.; W. H. Frost, Smith's Falls, Ont.; Moses Parker, Montreal; Waterous Engine Works Co., Brantford, Ont.; Montreal Car Wheel Co., Montreal; Drummond-McCall Pipe Foundry Co., Montreal.

A paper read by P. H. Griffin, M.E., of Buffalo, N.Y., president of the Canada Iron Furnace Company, at the International Mining Convention alluded to, on "The Manufacture of Charcoal Iron from the Bay and Lake Ores of Three Rivers District," and published in this souvenir, gives a most interesting description of the manufacture of iron in the Province of Quebec, showing that its inception followed in a comparatively short period after the first steps taken in the New England Colonies, where iron was first practically made in America. The progress of the Canadian industry is traced from that time down to the present; and the excellence of the iron now being produced by this company, and the special uses to which it is adapted fully described.

One does not usually expect to see poetry and pig iron intimately associated together; but Mr. Drummond succeeds most admirably in doing this in his beautiful souvenir, and not only poetry, but old legends which are still most firmly believed by the folk of the region where he first heard them. These narratives, and his descriptions of the beauties of the Laurentian regions in that section, are of such excellence as to place him high among the fine writers of the country.

A DISGRUNTLED IMPORTER.

A MONTREAL correspondent of the Toronto *Globe*, who has wit enough to conceal his identity under the nom de plume of British-Canadian, endeavors to mislead readers by falsely stating what the tariff upon different forms of iron is. He quotes thus: "Bar iron, 56 to 57 per cent. on British cost; forged axles, £6 18s. 6d. per ton of 2,240 pounds; steel barb wire, £6. 18s. 1d. per ton; pig iron 71 per cent."

In 1892 the imports into Canada of the articles of iron and steel to which this correspondent refers, and some other similar articles, were as follows: Forged axles and springs of iron and steel for other than railway use, 58,110 pounds, valued at \$6,192. The duty on this article is one cent per pound specific, and 30 per cent. *ad valorem*, the duty realized to the Government being \$2,440.51, or less than 40 per cent. on the value. Of this quantity only 21,254 pounds came from Great Britain, the balance chiefly from the United States. Our imports during that year of steel barb wire fencing, the duty upon which is 1½ cents per pound, amounted to 187,075 pounds, valued at \$5,905, the duty collected upon which was \$2,806.20, or a trifle more than 50 per cent. In this case about eleven-twelfths of the imports came from the United States and but one-twelfth came from Great Britain.

As shown in our issue of March 3rd our imports of pig iron in 1892 were 68,918 tons, valued at \$886,485, the duty of \$4 per ton bringing the cost up to \$16.80 per ton. The duty upon the foreign cost was the equivalent of 31 per cent. The quantity of wrought scrap amounted to 36,543 tons, valued at \$435,695, the duty being \$2 per ton. This is but 16 per cent. of the foreign cost. The imports of muck iron amounted to 3,100 tons, valued at \$56,186, or about \$18 per ton. The duty upon this article is \$9 per ton, or 50 per cent. of its value. Our imports of bar iron amounted to 7,500 tons, valued at \$231,468 or \$31 per ton. The duty of \$13 per ton is 45 per cent. of the value.

This veracious writer says that these duties are largely prohibitory, therefore, bring in but little revenue. Let us see. During 1892 the duties collected upon these articles were as follows:

Forged axles and springs.....	\$2,440
Steel barb wire fencing.....	2,806
Wrought scrap iron.....	65,255
Pig iron.....	275,797
Blooms, muck iron, etc.....	28,978
Bar iron.....	86,716

He tells us, too, that the trade in these articles that is not being done with Great Britain, because of the tariff, diminishes the Montreal harbor dues, suppresses the import trade, interferes with wharf employments and with those who furnish supplies to steam ships; that fewer steamers leave Britain for Canada owing to lack of cargoes coming this way; that steamers coming this way are actually defectively loaded and run great risk of capsizing while crossing the Atlantic, and lots more of such stuff.

The aggregate trade of Canada done with Great Britain in 1892 amounted to \$106,254,984, as against \$92,125,599 done with the United States, and was larger last year with the former country than during any year since 1874; therefore the tariff does not injuriously affect our trade with the Mother

Country. The great mass of the people of Canada are more interested in the establishment and success of the manufacturing industries of the country than they are in the matter of harbor dues collected at Montreal, or with the occupation of dock loafers in that city. There is never a dearth of steamers to take away all the freight offered for export, even if some of them come over in ballast, which they generally do not do; and if any of them come over actually defectively loaded, and run great risk of capsizing while crossing the Atlantic on that account, those who thus handle them should be confined in asylums or prisons. They are certainly unfit to manage ships.

We imagine this writer to be a small calibre importer or jobber in iron, or the agent of some foreign concern who desires to see our fiscal system swept away to the end that the foreign producer might swamp the Canadian manufacturer. There are quite a number of just such as he, and Toronto has a quota, as was apparent in the recent action of the Board of Trade.

A RECORD OF EVENTS.

IN pursuance of a plan to test its credit ratings the Bradstreet Company began four years ago the task of examining the records of each of the many thousand of business failures occurring in Canada and the United States each year. The undertaking had never been attempted before, and the results form a crucial test of the efficiency of this bureau service, and of its value to commercial, industrial and financial communities. Some idea of the magnitude of this work may be obtained from the fact that it involved the taking cognizance of more than 1,360,000 names of individuals, firms and corporations holding a distinct place in the business world in 1892. This, we are informed, required the co-operation of more than 100,000 correspondents, at some 78,000 cities and towns in Canada and the United States, and enabled the Bradstreet Company to present the total number in business in commercial, industrial and financial lines exclusively, compared with total business failures, compared with the two preceding years. Thus the proportions of failures to those in business during three years, as affecting Canada and the United States were as follows:—

	1890.		1891.		1892.	
	No. in Business	No. Failures	No. in Business	No. Failures	No. in Business	No. Failures
United States	989,420	10,673	1,018,021	12,349	1,051,564	10,270
Canada.....	73,918	1,626	75,589	1,846	75,860	1,689

The business failures discussed relate only to those which resulted in loss to creditors.

The cause of failures as assigned is that to which the failure was primarily due, and primary causes, as stated in the record, are classified as follows:—A. Causes due to faults of those failing. 1. Incompetence, subdivided as follows:—(a) Incompetence irrespective of other causes; (b) Inexperience, without other incompetence; (c) Lack of capital or the reverse; *i. e.*, trying to do too much business for capital employed, and (d) Unwise granting of credits. 2. Neglect of business:—(a) Speculation outside of regular business; (b) Neglect due to doubtful habits; (c) Personal extravagance. 3. Fraudulent disposition of property. B. Causes not due to fault of those failing. 4. Disaster. 5. Failure of others. 6. Special or undue competition.

In Canada, from 1890 to 1892, the proportion of failures, because of lack of capital, increased from 55.8 to 65.1 per cent.; from disaster, from 5.9 to 11.3 per cent.; to fraudulent disposition of property from 1.8 to 5.2 per cent.

The great amount of labor involved in examining the details of all these business failures; the surprising, interesting and valuable results obtained from analyses of the Bradstreet Company's credit ratings, and the classification of failures according to the primary causes thereof, constitute the motive for bringing out the unique work from which we have selected the foregoing facts. This book, we should have mentioned, is "1892—A Record—Not a Prospectus." An examination of the statistics embodied in this work, and their lessons when used within limits, will no doubt furnish important suggestions to all thinking business men.

EDITORIAL NOTES.

A MISTAKE was made when an effort was made at Ottawa to prohibit the manufacture of cottolene in Canada. Cottolene is an admixture of pure refined cotton seed oil and hog's lard and is a good and wholesome article of food; and it would be an act of injustice to the people to deprive them of it.

A CORRESPONDENT of a Toronto paper who is evidently an officer in one of our crack militia regiments, suggests that manufacturers should encourage their workmen—the young men—to become members of military organizations, and thus put themselves in condition to render the country valuable service should it ever be required. The suggestion is a good one, and no doubt the manufacturers would be glad to accede to any reasonable requests in this direction. To be a good soldier is to be a good citizen; and good soldiers and good citizens always love their country and are never numbered among those who would surrender it, either financially, industrially or politically. By all means give the boys a chance to become good soldiers.

We are advised by the publishers of the Shipping Manufacturers' List that the work will go into press about the middle of April. This work promises to be of great value to the business men of Canada and foreign countries as well, and every effort is being made to obtain from our manufacturers a full list of articles which they produce and classifying them. The work will be a cyclopedia of the manufacturers of Canada and their products, and must prove valuable for reference to all who produce for more than local consumption. Mr. Henry, the publisher, says that the names of no manufacturers are left out of the work who will furnish him with a list of articles which they manufacture, and their name and post office address. His advertisement appears elsewhere in this journal.

Pittsburgh, Penn., is the centre of a great American iron manufacturing industry. Staffordshire, England, is the centre of a great British iron manufacturing industry. Toronto has no iron manufacturing industry. Thirty-five per cent. of the selling price of a ton of iron in Pittsburgh is paid for labor

while in Staffordshire labor is paid but nine per cent. of the selling price. If Toronto had but one blast furnace such as that which we have heard so much talk about, but which has not yet materialized, it would give employment to a thousand men and increase the population at least five thousand. Every ton of iron it could produce would be consumed at home, and as much as thirty-five per cent. of the cost of it would be distributed among Toronto workmen. But we have no such industry.

The total population of British Columbia in 1892 was 103,000, of which 53,000 was contained in the cities of Victoria, Vancouver, New Westminster and Nanaimo. The railway mileage in that year was 717 miles, of which the Canadian Pacific system included 620 miles. The lumber industry of the Province included forty-six saw-mills, with capacity to cut 1,620,000 feet of lumber per day of ten hours; the output of lumber last year being \$3,107,000, valued at \$997,000. There were thirty-six salmon canning factories which produced (in 1891) 305,000 cases of salmon, valued at \$1,218,000. The four coal mines operated there in the last-named year produced 1,050,000 tons valued at over \$4,000,000, giving employment to 3,191 hands. The value of other mineral products that year (chiefly gold and silver), was \$130,000. The sealing industry gave employment to 63 vessels aggregating 4,119 tons, and 1,427 hands, who secured (in 1891) 45,385 sealskins. The value of exports from the Province in 1872 was \$1,858,051, and in 1892 was \$6,574,980.

RECENTLY a furniture manufacturer expressed a desire to have access to the American market. He felt that with our limited market his business could not, under what he calls trade restriction, be as profitable as it otherwise would be. Let us see what is the true situation. In Canada there are some forty furniture factories, supplying furniture to 5,000,000 people, an average of 125,000 people for each factory. In the United States there are 2,800 factories supplying furniture to the 65,000,000 market, or one factory to every 23,000 people. If one factory can supply 125,000 people in Canada, why not in the United States; and if the proportion of factories is greater in the United States than in Canada, it seems evident that there must be overproduction in that country. If there is no overproduction there, if one factory is required to every 23,000 of the population, why is there not an equal demand for furniture in Canada? If one factory is required for each 23,000 people in the United States, by the same rule there is room in Canada for some 217 factories, or 177 more than what we now have. If then there is room in Canada for five times as many furniture factories as we now have, why should furniture manufacturers not be satisfied with the situation? Last year the United States sold to Britain and her colonies \$1,500,000 worth of furniture, about \$270,000 of which came to Canada.

VERY few of our readers have accurate knowledge of the grain storage capacity of our Canadian grain producing region. On the main line of the Canadian Pacific Railway, from Port Arthur to Moose Jaw, there are 113 elevators and warehouses

with aggregate capacity of 7,415,700 bushels. On the Deloraine branch, from Morris to Deloraine, there are 68 such receptacles with 1,166,000 bushels capacity. On the Glenboro branch, from Carman to Nesbet, there are 30 with 631,000 bushels capacity. On Emerson branch, from Niverville to Emerson, 10 with 147,000 bushels capacity. On Souris branch, from Souris to Alameda, there are 30 with 642,500 bushels capacity. At Stonewall there are 3 with 32,000 bushels capacity; and on other branches of that road there are 4, with 26,400 bushels capacity; a grand total of 258 elevators and warehouses with capacity to hold 10,060,600 bushels. On the Manitoba and North-Western Railway, from Macdonald to Yorktown, there are 54 such, with 651,000 bushels capacity. On the Great North-West Central Railway, from Hamiota to Forest, there are 5 such, with 94,000 bushels capacity. On Northern Pacific Railway, from Winnipeg to Brandon, there are 27 such, with 661,500 bushels capacity. The grand total is; 344 elevators and warehouses with capacity to store 11,467,100 bushels. There are in Manitoba 43 flour mills, with daily capacity of 8,270 barrels, and 3 oatmeal mills with 190 barrels daily capacity.

OUR staunch and uncompromising protectionist contemporary, the *Boston Home Market Bulletin*, has the following pleasant remarks to make anent the recent meeting of the Canadian Manufacturers' Association:

"At the eighteenth annual meeting of the Association, which was held at Toronto, February 7th, Mr. John Bertram, of Dundas, was chosen president; and Mr. J. J. Cassidey, of Toronto, the able secretary, was re-elected. Resolutions were adopted against the employment of convicts in manufacturing; in favor of a Dominion Insolvent Act, and in favor of a first-class line of steamships between Canada and Great Britain, to be subsidized by the Dominion Government. In his report Secretary Cassidey advocated the substitution of specific for *ad valorem* duties in many cases, as a means of checking under-valuations. Mr. W. K. McNaught, of Toronto, the retiring president, delivered a very instructive and able address, from which we make extracts under another head. Secretary Cassidey has recently issued a souvenir manual of the Association, containing the names of its officers, its by-laws, and much other valuable information, together with numerous sound economic truths. The Association is loyal to Canada and Great Britain, (especially with a preferential trade arrangement), and there can be no doubt of its powerful and salutary influence in developing the industries of the country."

It gives us much pleasure to know that our American friends so fully understand and appreciate the value, scope and importance of the work being done by the Canadian Manufacturers' Association.

SOME of our Yankee friends have been worrying themselves sick over the imagined fact that Canada is building a fleet of gun-boats and war vessels at Owen Sound, which are intended for warlike demonstrations against their country. The true facts, which have never been concealed, are: that three small vessels have been built and no others are in contemplation. The dimensions of the first one built—the *Constance*—are: length, 125 feet; beam, 22 feet; draft of water, when ready for service, 8 feet. She has a compound vertical engine driving a single screw 7½ feet in diameter. She is a beautiful specimen of naval architecture, and several photographic views of her

adorn our office. She is employed in the Customs service in the suppression of smuggling in the Lower St. Lawrence, and when she encountered a piratical craft there a few months ago she was unable to make a capture at the time because she was not armed. The other vessels built for the Government at Owen Sound are almost identical in all respects. The *Curlew* is now doing duty as a Revenue cutter in the Bay of Fundy and along the coast of the Maritime Provinces; and the *Petrel*, the one launched in November, and not yet finished, is intended for protection of Canadian fishing interests on Lake Huron and Georgian Bay. Some of our badly frightened and excited American friends are talking of making double turreted monitors of the two railroad transport steamers recently built at Toledo, Ohio, which should be equipped with six-inch rifles, and which, it was hoped, might be able to defend their lake cities against this imaginary flotilla of Canadian war vessels. The transports alluded to are each 267 feet long and 52 feet beam, with three sets of compound engines operating three screws. Either of these vessels could comfortably stow away in their holds the whole three Canadian terrors. Let us have peace.

THE Canadian Patent Office Record usually reaches us about three months behind time, the wrapper bearing the words "On Her Majesty's Service." We do not know how far a service of this character is satisfactory to Her Majesty, but to everybody interested in the subject of patents it is next thing to being no service at all. Nineteenth century methods evidently do not prevail at the Government Printing Bureau.—*Electrical News*.

THE *Electrical News* might have added that THE CANADIAN MANUFACTURER, which regularly publishes the list of patents, is always right up to date.

THE *Montreal Herald* says: "By a sort of childish faith (in protection) it is believed that every pang of suffering felt in Europe meant an additional throb of joy in America; that the bread taken from the starving poor in London and Berlin goes in some mysterious manner into the pantries of the American workmen. This is an economical fallacy capable of easy demonstration. Take the tin plate industry. The McKinley Bill brought ruin to many of the tin plate factories in Wales; but in doing so it took also from every purchaser of tin plate in America, money that many could not afford to pay. The error which vitiates protectionism is its contention that a nation's interests are limited to its boundaries." And now the question is asked: If the McKinley tariff takes bread from the poor of London, in what way does it do it? We know the answer is that previously the London poor found employment in manufacturing goods for the American market, and that now that market is supported by the products of American labor, and it is a fact that the pantries of the American workmen are benefitted by the transaction. For whom, pray, do the American Government legislate—for the London poor or the American workmen? If American legislation can thus affect British subjects, why do not the British Government do something to meet this adverse legislation and to protect the interests of their own people? Admitting that

a nation's interests are not limited to its own boundaries, it cannot be denied that it is its duty to first and primarily look after the interests of its own people, after which, and incidentally, the interests of those beyond its boundaries. Charity begins at home. Duty begins at home. Love begins at home. Home first, last and all the time. Consideration for the stranger is secondary to these. There is no gospel of hatred in this religion.

The London *Morning Advertiser* has somehow discovered that Canadians "are eager to abolish their protective duties if the Mother country will give them corresponding advantages." Is this conclusion drawn from the declaration of Mr. Foster, that Canada desires to promote trade with Great Britain? The opportunity to develop a free trade sentiment in Canada was thrown away by raising the question of unrestricted reciprocity with the United States. The result is that the protectionists, for some years past, have had their own way. No doubt a special trade arrangement with Great Britain would imply a relaxation of Canadian protection, if relaxation does not come in that form, it is only a question of time when it will take another. Imperial federationists are moving in the direction of some special arrangement between the colonies and the Mother country, to include colonial contributions to the defence of the empire. This will form a crucial test of the possibility of making some such arrangement as is proposed.—*Monetary Times*.

Canadian protectionists would most seriously object to any special trade arrangement being made with Great Britain which would imply any material or general relaxation of such protection as we now have. They would probably be willing to establish a minimum duty as affecting British imports, the maximum duty to apply to other countries, but this concession to Britain would have to be in return for some economic favors

shown to Canadian imports into that country which other countries did not have. The only Imperial Federation which Canada would consider would be in the direction here indicated. Canadian manufacturers, no matter how attached they may be to the Mother country, are no more inclined to submit to strangulation by British manufacturers than by those of any other country. At this time Imperial federation seems to be as ethereal and intangible as the comet which the astronomers tell us was knocked into scintillating smithereens a few weeks ago by the earth. No distracting side issues at this time, please.

According to the *Petroleum Advertiser*, the Imperial Oil Company have taken the bull by the horns, and are now claiming to be protecting the oil consumer from the greed of the retailer of oil. It is explained that if the consumer is unable to obtain his illuminating oil at twelve and a half cents per gallon, all he has to do is to apply to the Company's nearest agent who will supply customers with oil in four gallon cans at the aforementioned price, Imperial measure. This is a wise thing for the company to do, but it is somewhat like locking the stable door after the horse had been stolen. They had a most excellent opportunity to thus protect the oil consumers of the country from the rapacity of the dealers long ago when it was first brought to their attention that a most iniquitous imposition was being practised. The cry from the sufferers from the extortion has been going up for years, and yet this Company never raised a finger to remove the unjust load that their customers were imposing upon every consumer of oil in the country. They knew that it was not the dealer who was charged with the extortion, but themselves, and yet they felt themselves so strongly entrenched behind an incongruous tariff

QUEENSTON CEMENT STANDS AT THE HEAD OF ALL CANADIAN NATURAL CEMENTS

Tests of Cements made by the Government during progress of work at Kingston Graving Dock, 1892, by Louis Coate, Acting Chief Engineer, Ottawa.

	TIME IN WATER	U. S. Wright & Sons, Portland	Portland Portland	Ancient Brand	German Portland Lion Brand	Syracuse Portland	Montreal Portland	Queens-ton Cement	Thorold Cement	Quebec Cement	Nascher Cement
Average tensile strength of 25 to 50 bricks of each, 1 in. square, made of best Portland cement mortar.	7 days	371.04	319.64	101.96	357.12	303.52	303.52	93.12	51.20	69.60	23.52
	30 "	338.70	415.96	242.32	523.44	447.00	447.00	190.80	130.24	117.72	55.20
	3 months	519.12	549.28	351.84	521.84	419.20	419.20	349.80	197.52	214.00	131.20
	9 "	654.52	628.20	591.76	589.72	521.20	521.20	508.24	326.40	311.50	178.24
	12 "	666.10	646.56	not given	629.36	601.20	601.20	408.88	333.96	370.20	199.72
	12 "	636.70	645.60	not given	644.00	615.20	615.20	428.28	307.96	389.12	221.12
Average tensile strength of 25 to 50 bricks of each, 1 in. square, made of best Portland cement mortar.	7 days	376.12	467.70	395.80	434.72	343.32	343.32	198.18	206.92	172.02	67.92
	30 "	471.22	512.50	372.40	532.40	423.88	423.88	271.08	131.02	104.16	60.72
	3 months	527.04	544.30	420.60	688.20	510.24	510.24	417.58	314.76	293.32	183.84
	9 "	614.72	625.40	427.60	626.84	542.88	542.88	472.10	323.36	300.32	176.82
	12 "	637.24	601.12	408.20	648.24	516.08	516.08	464.84	339.96	380.32	204.72
	12 "	649.24	628.40	446.12	640.56	531.12	531.12	508.30	347.32	390.00	278.00

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that they could laugh to scorn any who protested against the extortion. It is not often that any sensible business man will remain so long silent under the load of such opprobrium as was being heaped upon the oil men. They believed they had a snap that could not fail them, and therefore they paid no sort of attention to what was being charged against them. Ordinarily a sensible business man would deny the charge and expose its falsity, but these men declined to do so; and even when forbearance ceased to be a virtue, and the oil consumers sent up such a protest to the Government that it could not but be recognized, these unwise business men declined to explain the situation, or explained it unfairly. Instead of showing that it was the dealers who were the extortioners, and adopting measures as they seem to have now done to prevent the extortion, they attempted to screen them, and did screen them by arguing the question on other lines, and endeavoring to show that the duty was all right and should not be changed. An exhibition of a little foresight in the right direction at the proper time, somewhat of the character of the aftersight they are now so anxious to display, would have been an act of justice to the public and would probably have averted the consequences which have befallen them. Their present display of magnanimity and fairness is measured at its true value. They killed the goose that laid them such golden eggs. They are locking the stable door subsequent to the departure of their equine steed. The transaction is entirely too gauzy.

THE SOULANGES CANAL AND CANADIAN CEMENT.

To the Editor of THE CANADIAN MANUFACTURER.

Sir.—As a manufacturer of Canadian cement we read with interest the article under above heading which appeared in your issue of March 3rd. The views there set forth are to the point. They are sound, and cannot be easily contraverted. Why the Dominion Government should go to England for cement, when it can be produced in Canada, is something we cannot understand; and it is certainly not very encouraging to those interested in the manufacture of cement in this country. For the last fifty years the Thorold hydraulic cement—a natural cement—of which we are at present the manufacturers and proprietors, has been before the public, and during that time it has been used in the most important structures built in the country, notably the Victoria Bridge at Montreal; the towers of the old Suspension Bridge, and the Canadian abutments and approaches of the Cantilever Bridge at Niagara

Falls; the International Bridge at Fort Erie; the Kingston graving dock, and in the building of both the old and new Welland Canals exclusively; also the Grand Trunk Railway, the Canadian Pacific Railway, the Credit Valley Railway, the Northern Pacific Junction Railway, the Ontario & Quebec Railway, the Welland Railway, the great St. Clair Tunnel, and many other works. Testimonials which would require too much of your space to publish have been given the Thorold cement by such well-known engineers as the late John Page, Thomas Munroe, W. G. Thompson, P. A. Peterson, J. C. Bailey and others. Canadian cement is now being used in the construction of the "Soo" canal at Sault Ste. Marie, and the St. Lawrence River Canals, and it is passing strange that it is considered good enough for such important works as these, and not good enough for similar work in constructing the Soo-

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lages Canal. Another point that should not be lost sight of is the question of cost. Any of the Canadian natural cements can be supplied at fully \$1 per barrel less than will be paid for the English Portland cement, and as it is estimated that fully 500,000 barrels will be used in the work referred to, it can readily be seen the saving that might be effected. Certain it is that were this large quantity of cement to be distributed among the Canadian manufacturers it would materially assist them, and also secure employment for at least double the number of workmen now employed.

Yours respectfully,
ESTATE OF JOHN BATTLE.

Thorold, March 7, 1893.

P.S.—We might add that, since first manufactured in 1841, the Government of Canada have used over one million barrels of Thorold cement in the public works of the country.

WHY THE IRON DUTIES IMPOSED BY THE TARIFF OF 1857 HAVE FAILED TO PERMANENTLY BENEFIT THE COUNTRY.

To the Editor of THE CANADIAN MANUFACTURER.

DEAR SIR,—Sir Charles Tupper, in making his Iron Tariff changes in 1857, had two different parties to please, one being the miners of Canadian iron, chief of which was the Londonderry Iron Co., the other being those concerns who imported their raw materials from abroad, such as the Ontario Rolling Mills, all the Montreal rolling mills, and one or two in the Lower Provinces. To those not conversant with the different stages of iron making it is necessary to mention here the order in which they come:—

1. Iron ore, the product of the mines.
 2. Pig iron, the product of blast furnaces.
 3. Puddled iron, the product of puddling.
 4. Finished iron, the product of the rolling mills.
- The duties at present imposed on these articles are:—
1. On iron ore, free.
 2. On pig iron, \$4 per ton of 2,000 pounds.

3. On puddled iron, \$9 per ton of 2,000 pounds.
4. On finished iron, \$13 per ton of 2,000 pounds.

This rating looks fair and equitable, and but for one item which Sir Charles Tupper was foolishly persuaded by the rolling mill men to put in, and which has destroyed the symmetry of the whole fabric, it would be so. I refer to the item of wrought scrap, which enters at the extremely low rate of \$2 per 2,000 pounds, and is the raw material of the rolling mills. Had Sir Charles followed out the grading in an equitable way all through, wrought scrap would have had to pay the same rate of duty as puddled bars. And now note the result had this been done; the mills throughout the country would have been forced to use pig iron as a raw material, adding to their then plants either puddling plants or steel plants, and so giving additional employment to Canadians and helping to develop our iron deposits, and putting the iron business on a sure and permanent footing, the same as it is to-day in England and the United States. Through this duty on wrought scrap, we find the miners of Canadian iron using in their rolling mills imported scrap instead of the native article for making the finished article, bar iron, and they have been forced to do this to compete with their neighbors.

It is a well-known fact that the finished iron made from scrap piles is not, and cannot be, of a uniformly good quality, as foreign matter is bound to be in every scrap pile that will prevent it from welding together: for instance, an old file, a piece of steel, a piece of brass, and any quantity of mud will spoil the finished bar. If the rolling mill men were sure of what the scrap was composed of, then a good finished bar could be produced, but where they buy their scrap from all over the globe it is impossible for them to produce homogeneous iron.

As the Government are going to revise the tariff next session of Parliament, I trust that they will not make the blunder that has been made in the past, that is, in doing their grading, whether it be up or down, let it be equitable, not making fish of one and flesh of another, and not thinking so much of what particular party, man, or firm they are going to favor, but what is going to be for the best interests of Canada.

Yours, etc.,
MANUFACTURER.

MONTREAL, March 7, 1893.

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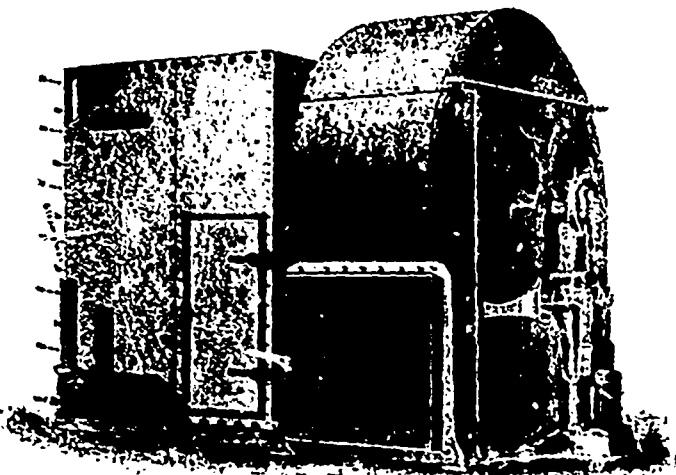
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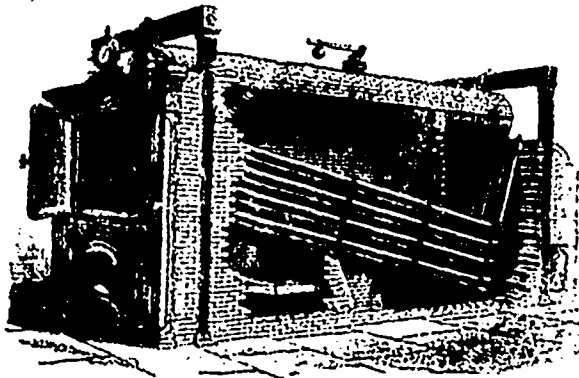
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CANADIAN PATENTS.

The following patents have been issued from the Canadian Patent Office from February 16 to February 28, 1893, inclusive.

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

MECHANICAL.

- 41,975 Mail pouch catcher and deliverer, A. Kimber, February 16th.
- 41,976 Grate, H. N. Hemingway, February 16th.
- 41,977 Sweating bath with dry heat, F. Riemer, February 16th.
- 41,978 Magazine toy gun, H. F. Hubbard, February 16th.
- 41,979 Locomotives known as Dummies, H. A. Ramsay, February 16th.
- 41,980 Car mover, C. W. Pierce, February 16th.
- 41,981 Curtain pole supporter, E. Martel, February 16th.
- 41,982 Ticket machine, J. D. Gibbs, February 16th.
- 41,983 Sash holder and lock, W. Coulter, February 16th.
- 41,984 Shirt, H. A. Hagon, et al, February 16th.
- 41,985 Nut lock, S. J. Stevens, et al, February 16th.
- 41,986 Brick making apparatus, H. W. Mead, February 16th.
- 41,987 Apparatus for separating ores, C. M. Ball, February 16th.
- 41,988 Automatic cartridge loader, F. C. Bennett, et al, February 16th.
- 41,989 Vehicle propelled by treadle action, J. Carpenter and A. Bonn, February 16th.
- 41,990 Inhaler, J. W. Parker and R. Josten, February 16th.
- 41,993 Piano, J. W. Reed, February 16th.
- 41,994 Lasting boot and shoe, G. W. Copeland, February 16th.
- 41,995 Tack driving machine, C. W. Copeland, February 16th.
- 41,996 Amalgamating apparatus for crushed ores and like reduced bodies, W. W. Fyfe, February 16th.
- 41,997 Velocipede, E. J. O'Connor, February 16th.
- 41,998 Telephone directory, L. Séguin, February 16th.
- 41,990 Burning straw, corn stalks, etc., for domestic and other purpose, L. Field, February 16th.
- 42,000 Furnace for burning garbage and other wet and offensive substances, G. N. Warner, February 17th.
- 42,001 Removing material from thread sber, C. L. Travis, February 17th.
- 42,002 Combination cigar case, C. L. Pratt, February 17th.
- 42,003 Auxiliary steering gear, H. L. Weitzel, February 17th.
- 42,004 Knife, etc., H. E. Kelley, February 17th.
- 42,005 Locomotive and marine boiler, F. Barclay, February 17th.
- 42,006 Furnace for burning garbage and other wet and offensive substances, G. N. Warner, February 17th.
- 42,007 Canal diggor, J. McMullen, et al, February 17th.
- 42,008 Cash carrier apparatus, F. J. H. Hazard, February 17th.
- 42,009 Dredging and pumping on the suction system, J. A. Wade and J. Cherry, February 17th.
- 42,010 Recerding moving cabs, C. Kehr, February 17th.
- 42,011 Force feed lubricator, C. H. Besloy and F. N. Gardner, February 17th.

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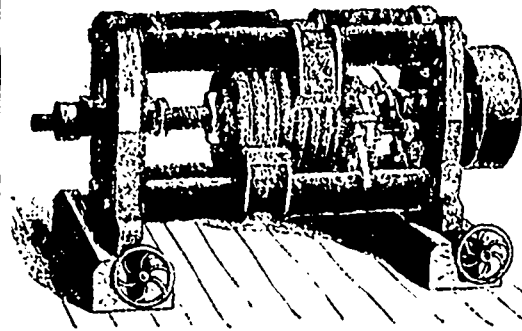
- 42,012 Anti-horse motion cart gear, W. H. Jackson, February 17th.
- 42,013 Polishing wheels, pulleys, and the like, A. R. Yates, February 17th.
- 42,014 Crimping and folding pieces of cloth or other material, C. E. Williams, February 17th.
- 42,015 Check, draft or other money order or instrument, J. L. Spalding, February 17th.
- 42,016 Safety valve for steam boilers, J. M. Coale, February 17th.
- 42,017 Automatic car brake, W. B. Guernsey, February 17th.
- 42,018 Buckle holder for reins, W. C. Edgo, February 17th.
- 42,019 Steam boiler furnace, F. Barclay, February 17th.
- 42,020 Bottle and sealing plate, R. S. Wisenfield, February 17th.
- 42,022 Partitioning drawers and other structures, W. E. Richards, February 17th.
- 42,023 Locking railway signal, A. G. Marks, February 17th.
- 42,024 Puzzle game, F. J. Forster, February 18th.
- 42,025 Piano agraffe, J. W. Reed, February 18th.
- 42,026 Pedal for piano, J. W. Reed, February 18th.
- 42,027 Current wheel, H. C. Gardner, February 18th.
- 42,030 Drawing warp thread, R. H. Ingersoll, February 18th.
- 42,031 Grain drill, D. E. McSherry, February 18th.
- 42,032 Riding plow, The Cockshutt Plow Co. (Ltd.), February 18th.
- 42,033 Track sweeper, W. H. Leigh, et al, February 18th.
- 42,034 Frame for mirrors, etc., G. J. B. Rodwell, February 18th.
- 42,035 Aeration, bottling and discharge of beers and other liquids, A. B. Jackson, February 18th.
- 42,038 Game apparatus, J. Gamble, February 18th.
- 42,040 Chimney flue check valve, R. J. Stead and J. Watt, February 18th.
- 42,041 Car brake, P. McMullen and M. Callahan, February 18th.
- 42,042 Stand for tea pots, J. W. Mealey, February 18th.
- 42,043 Ore sampling machine, Bridgman Manufacturing Co., February 18th.
- 42,044 Feedwater heating and purifying apparatus, D. W. McCalm. et al, February 18th.
- 42,045 Roofing cement, G. W. Reed, February 18th.
- 42,046 Bobbin support for spinning mules, etc., T. C. Dill, February 18th.
- 42,047 Elevating liquids, J. G. Pohlo, February 18th.
- 42,050 Smoke consuming furnace, W. D. McKenzie, et al, February 20th.
- 42,051 Sewing shank buttons to fabrics, W. E. Bennett, February 20th.
- 42,052 Sewing shank buttons to fabrics, W. E. Bennett, February 20th.
- 42,053 Beds for hospitals, etc., J. Eggert, February 20th.
- 42,055 School bag, J. E. Edwards, February 20th.
- 42,056 Lamp extinguisher, M. Goetze, February 20th.
- 42,057 Circular saw, J. Class, February 20th.
- 42,058 Pedal attachment for organs, W. A. Hobday, February 20th.
- 42,059 Closing the ends of bags, E. C. Wild, February 20th.
- 42,060 Weighing and price scale, G. Lundborg, February 20th.
- 42,064 Egg case, F. F. Bischoff, February 20th.
- 42,065 Steam cooker and odorless boiling pots combined, E. A. Gill, February 20th.
- 42,066 Ventilator, The Davidson Ventilating Co., February 20th.
- 42,067 Revolvable grate for steam boiler furnace, P. I. Crowe, February 20th.
- 42,068 Oil lamp, F. T. Vine, February 20th.
- 42,069 Rod coiling apparatus, H. Roberts, February 20th.
- 42,070 Car coupler, J. P. and J. E. Kirwan, February 20th.
- 42,071 Semaphore signal device, G. H. Johnson, February 20th.
- 42,072 Making beam hangers, J. Grant, February 20th.
- 42,073 Gots, C. W. Trenholme, et al, February 20th.
- 42,074 Photographic paper coating device, J. A. Rose and S. V. Gage, February 20th.
- 42,076 Rotary engine, A. H. Brintnoll, February 20th.
- 42,077 Bench floor for hot house, W. P. Wight, February 20th.

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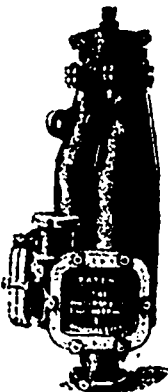
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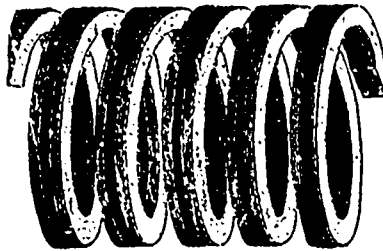
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- 42,079 Lamp extinguisher, J. M. Seldon, February 23rd.
 - 42,080 Valve, J. LaBurt and W. K. Agricola, February 23rd.
 - 42,081 Check and cash register, W. H. Gilman, et al, Feb. 23rd.
 - 42,082 Corrugated metal pipe, W. J. Plecker, February 23rd.
 - 42,083 Roller and ball bearing, F. Purdon, et al, February 23rd.
 - 42,084 Tobacco pipe, A. W. Carr, February 23rd.
 - 42,085 Car coupling, J. L. Smith, February 23rd.
 - 42,106 Movable chain draw-bar and safety chain coupler for railway cars, J. E. Mullaney and L. R. Thian, Feb. 24th.
 - 42,107 Preventing the swarming of bees, H. P. Langdon, Feb. 23th.
 - 42,108 Railway crossing signal, G. S. Boyler, February 28th.
 - 42,109 Confectioner's machine, A. W. Paris and N. A. Clacher, February 28th.
 - 42,110 Lowering collins and caskets into graves, C. W. Young and J. M. Stevens, February 28th.
 - 42,111 Railway car, S. J. Rosenfeld and J. L. Levy, Feb. 28th.
 - 42,113 Hot water heating apparatus for cooking range, G. T. Brewer, February 28th.
 - 42,114 Automatic car coupler, W. J. Brush and H. C. Fayette, February 28th.
 - 42,115 Sliding partition, J. Hayes, February 28th.
- ELECTRIC.
- 41,991 Electric elevator, A. Neuburger, February 16th.
 - 41,992 Controlling automatically the feed mechanism of arc electric lamps, J. Brockie, February 16th.
 - 42,028 Printing telegraph, Equitable Manufacturing and Electric Co., February 18th.
 - 42,029 Secondary or storage battery, W. W. Gibbs, February 18th.
 - 42,036 Magnetic ore separator, T. A. Edison, February 18th.
 - 42,037 Propelling mechanism for electric vehicles, T. A. Edison, February 18th.
 - 42,054 Electric railway, G. T. Woods, February 20th.
 - 42,061 Electric signal apparatus, The Standard Electric Signal Co., Co., February 20th.
 - 42,062 Electric motor car, W. Robinson, February 20th.
 - 42,075 Electric motor and method of operating the same, T. A. Edison, February 20th.
 - 42,078 Electric conductor, G. E. Heyl, February 23rd.
 - 42,086 Electric welding, M. W. Dewey, February 24th.
 - 42,087 Electric welding, M. W. Dewey, February 24th.
 - 42,088 Electric railway car, M. W. Dewey, February 24th.
 - 42,089 Utilizing electricity in the formation of sheet metal articles, M. W. Dewey, February 24th.
 - 42,090 Forming or shaping sheet metal electrically, M. W. Dewey, February 24th.
 - 42,091 Utilizing electricity in the formation of metallic cartridge cases, M. W. Dewey, February 24th.
 - 42,092 Electric lighting and heating apparatus for electric railways, M. W. Dewey, February 24th.
 - 42,093 Electrically heating bars, etc., for welding and working purposes, M. W. Dewey, February 24th.
 - 42,094 Forming or shaping sheet metal electrically, M. W. Dewey, February 24th.
 - 42,095 Electric railway, M. W. Dewey, February 24th.
 - 42,096 Electric soldering and cementing cans, M. W. Dewey, February 24th.
 - 42,097 Electric soldering and cementing cans, M. W. Dewey, February 24th.
 - 42,098 Electric welding, M. W. Dewey, February 24th.
 - 42,099 Electric welding, M. W. Dewey, February 24th.
 - 42,100 Electric motion transmitter, M. W. Dewey, February 24th.
 - 42,101 Electric soldering and cementing cans, M. W. Dewey, February 24th.
 - 42,102 Electric soldering and cementing cans, M. W. Dewey, February 24th.
 - 42,103 Electric heating, M. W. Dewey, February 24th.
 - 42,104 Electric heating, M. W. Dewey, February 24th.
 - 42,105 Electric heating, M. W. Dewey, February 24th.
 - 42,112 Regulating electrically driven mechanism, W. H. Knight and W. B. Potter, February 28th.
- SCIENTIFIC PROCESSES.
- 42,021 Gas for illuminating and heating purposes, J. H. R. Dinmore, February 17th.
 - 42,039 Treatment of nickel matto containing copper and other metals, The Canadian Copper Co., February 18th.
 - 42,048 Electrolytic decomposition of alkaline salts, H. Y. Castnor, February 18th.
 - 42,049 Solidifying mineral vegetable and animal oils and volatile and inflammable fluids, W. S. and W. F. S. Cheuhall, February 18th.
 - 42,063 Treatment of pyrites, J. Strap, February 20th.

"GUTTAPERCH" PACKINGS.

The accompanying illustrations show some of the different styles of automatic anti-friction, self-lubricating piston packings manufactured by the Gutta Percha & Rubber Manufacturing Company, of Toronto.



SPIRAL PACKING.

This company inform us that since packings similar to these were first offered to the trade, they have carefully studied the results of different formulae used in making the stock, and in the lubricating treatment to which it is subjected. It is well known that rubber articles, as usually made, are destroyed by contact with oil. Much experimenting has been done in efforts to combine rubber with the two best lubricants known, viz., oil and plumbago; and this company has succeeded in discovering a process by means of which the rubber and fibre in the "Guttaperch" packings are made to retain a sufficient proportion of both these ingredients to render them absolutely self-lubricating until worn out, at the same time without deleterious effect on the rubber should the packings remain unused for a long time after being made. This process, we are informed, is as far in advance of that employed previously by other makers, as theirs was superior to the old-fashioned packing without lubricant.

The elastic rings are made of the proper size to fit perfectly around the piston rod, and fill the stuffing box, and are subjected to the same lubricating process as the spiral packing.

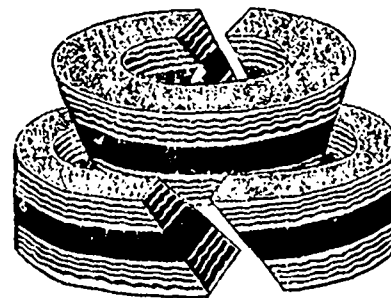
They are made to order, to any desired size, and are packed in suitable boxes, made specially for the purpose, to keep them free from dirt and grit in transit.

The sectional rings are made similar to the elastic rings, with the exception that they are cut diagonally into two sections, as shown in cut, so as to perfectly break the joint and provide compensation for wear, by simply tightening the nuts gently (thus causing the rings to increase in outside diameter), or adding a new ring from time to time as needed.

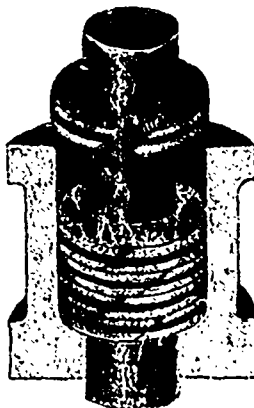
For high speed engines, steam hammers, ammonia pumps, and engines where the piston or valve rods are out of line, this packing is particularly recommended. The use of them prevents scoring and wear on the piston rod; it is entirely automatic and self-lubricating, and is always ready.

The "Guttaperch" Spiral Piston Packing is a practical and profitable stock packing for dealers to handle. Made of the same materials, and lubricated by the same process, it possesses many of the advantages of "Guttaperch" ring packings, and in addition, the distinct advantage of being always on hand, ready for instant use, without the necessity of sending a long distance for rings that would have to be made to order.

It is neatly put up in attractive telescope boxes, each size in a special box by itself, bearing printed instructions for use. The dimensions and weights are plainly marked on the outside, showing the contents of each box, so no mistake need be made in selecting the size wanted for use. It is made in coils 12 feet long, and in sizes from 3-16 in. to 2 inches, increasing 1-16 in. to each size; larger sizes made to order. This packing is made either with the elastic rubber cushion on the inside, or with fibrous centre and rubber cushions on the outside. The cuts show cushion in the centre.



SECTIONAL ELASTIC RING.

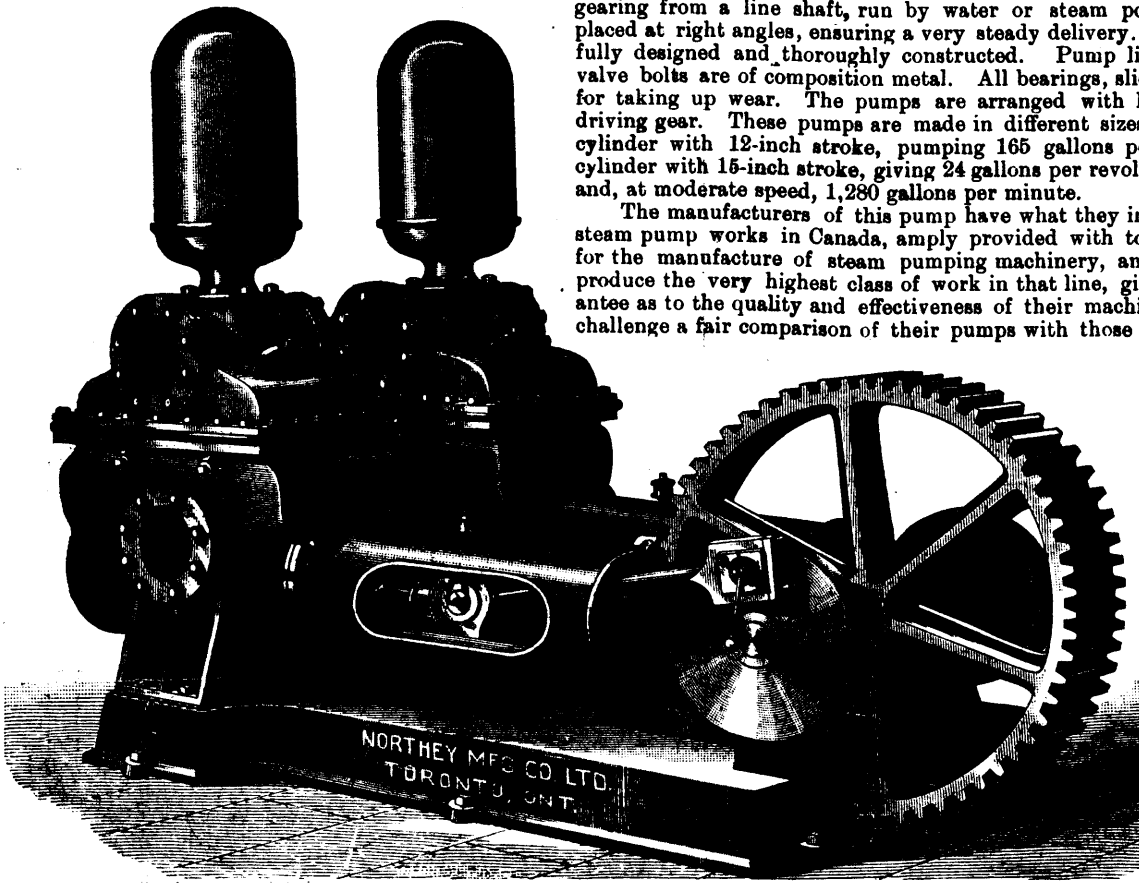


PLASTIC RING.

PUMPING MACHINERY.

THE illustration herewith presented is of a Duplex Power Pump, piston pattern, manufactured by the Northey Manufacturing Company, Toronto. This pump is recommended for heavy, continuous work, where steady and uniform delivery of water or other liquid is required. These pumps are fitted to be geared direct to the jack-shaft of turbine wheels, or may be driven by belting or gearing from a line shaft, run by water or steam power. The cranks are placed at right angles, ensuring a very steady delivery. The pumps are carefully designed and thoroughly constructed. Pump linings, valve seats and valve bolts are of composition metal. All bearings, slides, etc., are arranged for taking up wear. The pumps are arranged with heavy and substantial driving gear. These pumps are made in different sizes, ranging from 5-inch cylinder with 12-inch stroke, pumping 165 gallons per minute, to 14-inch cylinder with 15-inch stroke, giving 24 gallons per revolution of each cylinder, and, at moderate speed, 1,280 gallons per minute.

The manufacturers of this pump have what they inform us is the largest steam pump works in Canada, amply provided with tools specially designed for the manufacture of steam pumping machinery, and are in a position to produce the very highest class of work in that line, giving an absolute guarantee as to the quality and effectiveness of their machines. They invite and challenge a fair comparison of their pumps with those of other makers, both



DUPLER POWER PUMP.

as to design, adaptability to the work to be performed, and excellence of materials and workmanship; and they request special attention to their new valve gear, which is simple, positive, noiseless, adjustable and reliable. In a direct acting steam pump the reliability of the valve gear is the point to be first considered.

This company manufacture pumps for every possible use; and of course it would be unnecessary to undertake, in this article, to even mention all of them—to describe

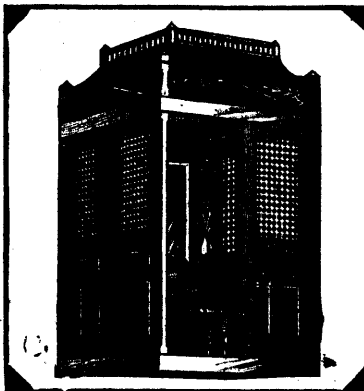
them would be impossible. But we can make allusion to a very few embraced in their catalogue.

The improved boiler feed, or pressure pump is arranged for pumping hot or cold water, and combines all necessary features. It will run as slowly as desired under any pressure, exactly compensating for the water evaporated, a feature of great importance in boiler feeding. It requires but little attention, and the construction is such that it may be run at a speed that makes it an efficient fire pump. It has suction and delivery openings on both sides, so that connections may be made on either side. It has a hand power attachment so that it can be used when steam is down for filling boilers, washing decks, etc. The hand lever can be instantly removed simply by lifting it from the pin on which it rests.

The improved double acting plunger pump, for feeding boilers, pumping gritty water, etc., is specially designed for high pressure. It is adapted for either hot or cold water, and where gritty or muddy water is to be pumped. As the plungers only are exposed to the action of the water, bad water has no effect upon the working parts, as in piston pumps, and the packing being outside, and in full view, any leak may be instantly detected. All the working parts are made to gauge, and are therefore interchangeable; and duplicate parts can be quickly substituted when parts become worn or broken.

The plunger pattern Duplex Steam Pump, for hydraulic elevators, feeding boilers, etc., is well made, inexpensive, and calculated for general service at moderate pressure. The valve motion of the larger sizes is adjustable, thus assuming full stroke under all conditions of service. They are fitted with hand lever attachments, composition removable linings, pistons, etc., as desired.

For further information regarding any sort of pump for any service, illustrated catalogues, price lists, etc., address as above.



ELEVATORS

FENSOM ELEVATOR
WORKS
52-54-56 DUKE ST
TORONTO.

ELECTRIC HYDRAULIC
STEAM & HAND-POWER
PASSENGER & GOODS
ELEVATORS. DUMB WAITERS

FEED WATER HEATER.

In another page will be found the business card of Mr. H. E. Moffat, of Woodstock, Ont., having reference to the Austin feed water heater and lime, mud and oil extractor, manufactured by him. It will be remembered by those who attended the Toronto Industrial Exhibition last September that Mr. Moffat had this apparatus on display in Machinery Hall where it attracted much attention, and in connection with which was shown a large and interesting exhibit of impurities recovered from water passing through this apparatus, and which would have been deposited in the boiler to which it was attached, if it had not been for its intervention. Of course all steam users understand what this means; and they will also appreciate the advantage to be gained in thus protecting their boilers against the entrance of such destructive substances.

A most important question with all steam users is how to divest the water entering into their boilers of the impurities contained in it such as mud, lime, magnesia, oil and other foreign substances, which, when allowed to pass with the feed water into the boiler, forms a thick crust in the flues and shell, thus causing an extra expense in keeping up the required steam pressure; and there is always danger of explosion caused by the sudden peeling off of any

portion of this incrustation, allowing the water to come in contact with the overheated metal. It is stated by experts that where the incrustation in a boiler is one-sixteenth of an inch thick the consumption of fuel must be increased fifteen per cent. to keep up the required pressure; where it is one-quarter of an inch thick the consumption of fuel must be increased sixty per cent.; and where it is a half-inch thick there must be an increase of fuel of one hundred and fifty per cent. This is an enormous and unnecessary expense of itself; but this is not all of it, as the extra heat required to penetrate through this incrustation also burns out the boiler plate and destroying the boiler.

In this apparatus the feed water is sprayed into it, and, coming into contact with the steam exhausted into it, produces absolutely pure water. The construction of this heater is such as to preclude any pressure therein, or any back pressure on the engine, thus enabling the engine to work much easier than it would if it had to force the exhaust steam through a longer exhaust pipe.

Following are the names of some of the parties using this apparatus: Messrs. Shultz Bros., Bain Bros. & Co., Wm. Buck, Brantford Carriage Company and Farmers Binder Twine Company, Brantford, Ont.; Hamilton Bridge Company, Hamilton; J. S. Authors & Co., Berlin Piano Company, Berlin Felt Boot Company, T. J. Huber & Co., Berlin, Ont.; Canadian Office and School Furniture Company, Preston, Ont.; Forbes Manufacturing Company, Hespeler, Ont.; R. McDougall & Co., Galt, Ont.; C. Press, Innerkip, Ont.; Bain Bros., Plattsville, Ont.; J. & J. Livingston, Baden, Ont.; D. W. Kern & Co., Thomas Organ Company, James Hay, Jr., Electric Light and Gas Company, Woodstock, Ont.; Evans Bros. Piano Company, Ingersoll, Ont.; J. M. Green & Co., St. Thomas, Ont.; Knechtel Furniture Company, Hanover, Ont.

For further information, illustrated descriptive catalogue and testimonials from those who know from practical experience the value of this apparatus, apply to Mr. Moffat, at Woodstock.

FOUNDRY FACINGS

Core Compound, Ceylon Plumbago, And Foundry Supplies.

WRITE FOR CATALOGUE AND PRICES.

Hamilton Facing Mill Co., Hamilton, Ont.

New Glasgow. **I. MATHESON & CO.** Nova Scotia.

Engineers and Boiler Makers

MANUFACTURERS OF

Corliss Steam Engines

Especially adapted for Mills and Factories.

Agents for

D. H. and C. Haggie's Patent Wire Rope for Mining Purposes

DRAPER'S IMPROVED

GLOBE VALVE

Patented.

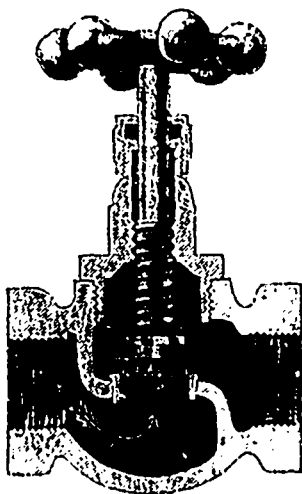
Invented to prevent Seals or Grains of Dirt getting caught between faces at point of closing.

When the projection on valve enters the seat orifice, of which it is an easy fit, only clean fluid rushes past. Seals, etc., are excluded and the faces meet with nothing to injure them. Send for prices and particulars.

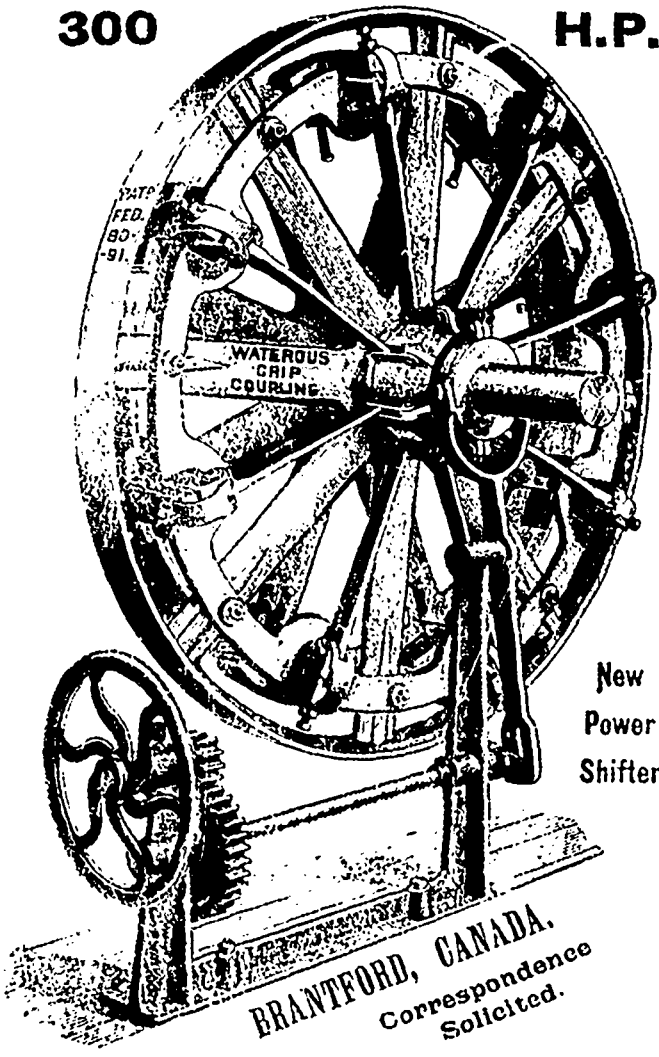
T. DRAPER,
Manufacturer.

ALL VALVES for various purposes. Oil and Salt Well Supplies, Etc., Etc.

PETROLEA, ONT.



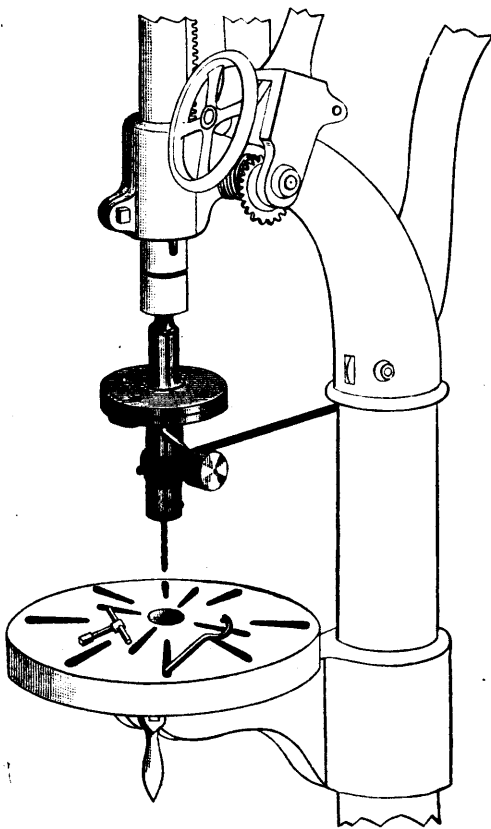
300 H.P.



New Power Shifter

BRANTFORD, CANADA.
Correspondence Solicited.

HIGH SPEED SENSITIVE DRILLING ATTACHMENT.



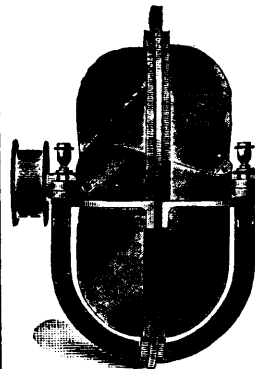
THE accompanying illustration is of a device which has proven to be of much practical service in drilling small holes. The upper part is made to fit the hole in drilling machine spindle, and can be attached as quickly as changing a drill. By an arrangement of gearing inside, the speed of the little chuck at lower end is multiplied 4 times. There is also a safety device which can be adjusted so that the drill and chuck will stop instantly should the drill meet with any undue strain, thus preventing its breaking; hence the safety of the drill does not depend upon the skill of the operator.

the largest drills intended to be used with the attachment, or for the smallest. It will be seen that by the use of this attachment the work usually done in a sensitive drill press can be done in the largest drilling machines with the greatest safety, as the most delicate drill can be used with perfect freedom from breakage. A great deal of small drilling has of necessity to be done in large machines on account of the size and weight of the work. The feeding is accomplished by the usual arrangement on machine, or by the lever shown on side of attachment. The rod extending to side of column is to prevent the whole attachment from revolving. They are got up in the best possible manner and are guaranteed to stand the usage they are put to in the machine shop.

A patent has been applied for in Canada and the United States. They are manufactured by the inventors, Messrs. Stevens, Hamilton & Co., Galt, Ont.

THE BARNEY COMPOUND VENTILATING WHEEL.

THE illustrations shown herewith are of the Barney compound ventilating wheel, manufactured by the Barney Ventilating Fan Company, Boston, Mass. This is a scoop wheel, and is constructed in two sections, each section consisting of a series of blades mounted upon hubs at an angle to the axis of the hub, with the inner straight edge of each blade lying in the plane of the rear face of the section; and the outer curved edge forming the front face of the section. These two sections are united upon a common shaft, with the planes of their inner faces abutting, and the outer ends of each blade secured to a common peripheral central ring, the concave inner surfaces of each two alternate opposite front and rear blades forming channels for the passage of air through the wheel at an angle to the axis of the wheel, correspond-



EDGE VIEW.

ator. This adjustment can be made in an instant to accommodate

THE

**“OPTIMATES”
POWER HAMMER**

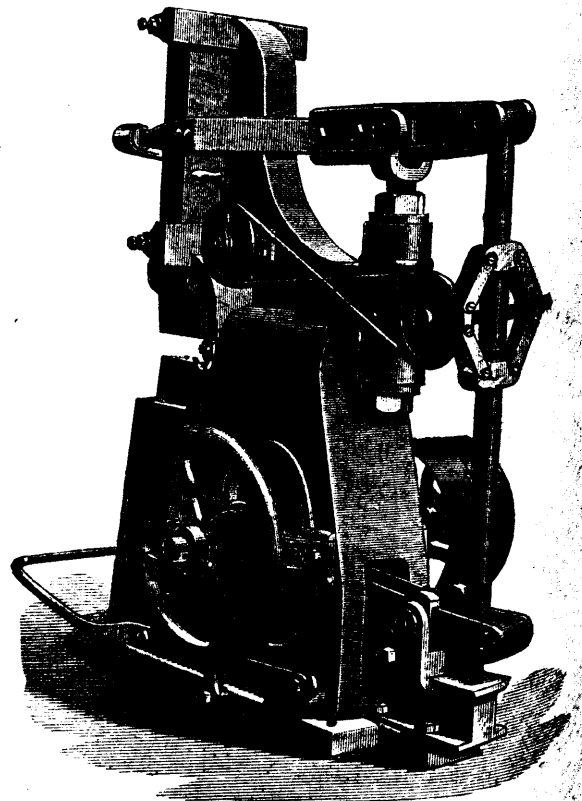
Patented in the United States, Canada, and England.

W. H. LAW,
Inventor.

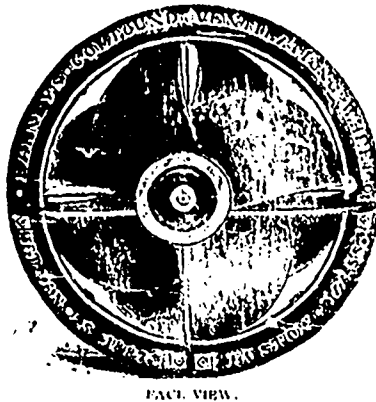
MANUFACTURED BY

The Central Bridge and Engineering Co., Ltd.

PETERBOROUGH, ONTARIO, CAN.



ponding in degree with the angle at which the blades cross the shaft. The compound wheel in central cross section presents an elliptical outline. When this compound wheel is rotated, as the blades on the front and rear faces of the wheel flare in opposite directions, those on the front or feeding face will draw the air into the wheel, while the blades on the rear or discharging face will beat away the surrounding air and form a vacuum at the rear of the wheel and in advance of the discharged column of air, thereby increasing both the volume and the velocity of the column of air moved through the wheel.

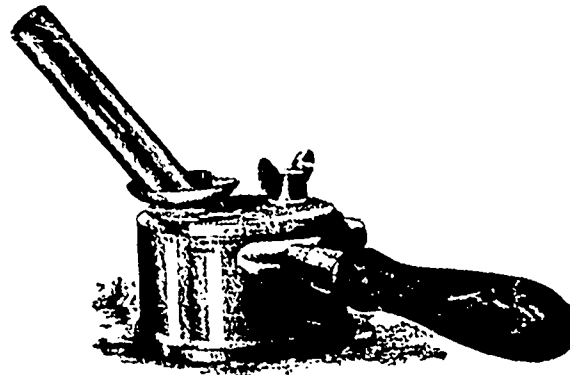


Another new and valuable principle of this wheel is the peculiar form and construction of the vital part of any air-moving wheel, viz.: the blade. It will be seen, by reference to the cuts, that the blade in application is reversed from the form in general use; that is, the widest part of the blade is at the centre of the wheel, where the speed is the slowest; and the narrowest part of the periphery, where it is the fastest; and as this wheel feeds from every angle, even at right angles to its shaft, the air is drawn into it in a more even volume, and when under pressure the air is retained and does not escape back through the centre, as is the case with other fans or wheels whose blades are not constructed to meet the difference in velocity of blade between the centre and periphery. This is especially valuable in blowing or exhausting air under pressure caused by friction, such as drying wool, forcing air through long ducts, and like work. The Barney compound ventilating wheel is constructed with a view to service, made of the best material, carefully adjusted, balanced, and put together, and guaranteed to be all that is claimed for it for moving large volumes of air at the smallest outlay of power.

For further information, including illustrated descriptive pamphlet, terms, price list, weight of wheels, directions for setting, etc., apply as above.

THE VULCAN TORCH.

The accompanying illustration is of the "Vulcan" torch, manufactured by the Vulcan Company, 249 Madison Avenue, New York City. It is intended to burn naphtha, or gasoline, and at a cost of about one cent will generate 2,000 degrees or more of heat, and



maintain that temperature during a steady blast of an hour or more. It is claimed to be absolutely safe in use, and not liable to get out of order; and its

construction is such that it can be taken apart and carried in the pocket. The simplicity of it is one of its strongest recommendations to the metal trades; and it cannot but be invaluable to railroad men, coppermiths, tinsmiths, roofers, plumbers, gas-fitters, car-builders, machinists, for electrical construction, etc.; and is specially adapted for painters' use in burning off paint. It is patented in Canada, United States, Great Britain, and other countries. For further information apply as above.

MACHINERY

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

- ONE BOILER, TO BRICK IN, 41 in. dia. x 11 ft. 7 in. long, 41 3 in. tubes, in first-class order.
- THREE 25 H.P. PORTABLE loco. fire box boilers, in good order.
- TWO 6 H.P. FIRE BOX BOILERS for cheese factories.
- ONE 2 x 15 SLIDE-VALVE ENGINE, Beckett's make.
- TWO 9 x 12 HORIZONTAL ENGINES, Waterous make, "Clipper."
- ONE 9 x 12 HORIZONTAL ENGINE, Morrison maker, Hamilton.
- TWO 5 1/2 x 9 SLIDE-VALVE ENGINES, Beckett's make.
- ONE 8 H.P. ENGINE, Leonard make, nearly new.
- ONE 12 H.P. HORIZONTAL PORTABLE ENGINE and boiler on skids; Ames & Co., makers, Oswego, N.Y.
- ONE 12-H. H.P. TRACTION PORTABLE ENGINE and boiler Oshawa make.

MACHINERY:

- ONE 24-INCH MCGREGOR, GOURLAY & CO. make, heavy surface planer, almost new.
- ONE ONE-SIDE MOULDER.
- TWO 24-INCH CANT, GOURLAY & CO. make, light surface planers, in good order.

- ONE ALMOST NEW VERTICAL SPINDLE boring machine, McGregor, Gourlay and Co.'s make.
- ONE ALMOST NEW IRON TOP JIG SAW, Cowan and Co., makers.
- ONE BLIND SLAT TENONING MACHINE.
- SIX GOOD SAW TABLES.
- ONE WOOD FRAME TENONER in good shape.
- ONE SET TWO HEAD BLOCK SAW MILL irons.
- ONE ALMOST NEW GENUINE "BAILEY" GAUGE, or handle lathe, with countershaft.
- ONE ALMOST NEW SPINNING LATHE, for spun metal work, with countershaft.
- FOUR DOWELL MACHINES.
- ONE ALMOST NEW 10-INCH WHEELS BESON BAND SAWING MACHINE, with one 2 1/2-inch blade.
- ONE ALMOST NEW DOUBLE EXCELSIOR CUTTING MACHINE, with packer.
- ONE SELF-ACTING WATEROUS MAKE SHINGLE MACHINE and jointer.
- ONE ALMOST NEW, GOLDIE & McCULLOCH make, Purifier.
- ONE 20-INCH "WATEROUS" CHOPPER, almost new, complete with double elevators.
- ONE LOZENGE MAKING MACHINE, of large capacity, American make, complete with brass dies and printing attachment.
- ONE DOUBLE EXCELSIOR CUTTING MACHINE, almost new.
- ONE GOLDIE, McCULLOCH PURIFIER, almost new.
- FULL PARTICULARS CHEERFULLY GIVEN upon enquiry at the Canada Machinery and Supply Co., Brantford, Ont.

Captains of Industry.

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

MR. W. A. KENNARD is building a new grist mill at Burnaby, Ont.

THE Toronto Times has installed a 10 h.p. and a 2 h.p. Reliance motor.

MR. JOHN JEWELL has started a carriage and wagon factory at Lindsay, Ont.

MESSRS. CASTLE & RICHARDSON, Montreal, have installed a 250 volt Reliance motor.

THE Brantford Electric Light and Power Company have installed an 80 h.p. Reliance generator.

MESSRS. McDOWELL & Co., St. Catharines, Ont., have their new basket factory in full operation.

MR. J. H. ETHERINGTON has lately added more machinery to his carpet factory at St. Catharines, Ont.

MESSRS. HORNE BROTHERS, Lindsay, Ont., are making considerable alterations in their woolen mills.

MR. W. W. CARTER is refitting his saw mill at Fesserton, Ont., and will be running in two or three weeks.

MR. GEORGE WILSON, builder, St. Catharines, Ont., is running the machinery of his shop by electric power.

MESSRS. PATTERSON & CORBIN, St. Catharines, are building two more cars for the Windsor Electric Railway.

MESSRS. A. G. VAN EGMOND'S SONS are installing an electric light plant in their woolen mills at Seaford, Ont.

MESSRS. McPHERSON & Co., Fesserton, Ont., are remodeling their saw mill and putting in some new machinery.

MR. CATTLE, of Whitechurch, is buying his machinery from the Canada Machinery & Supply Company, of Brantford, Ont.

THE Canada Hair Cloth Company, St. Catharines, are coming full capacity and report business much better than last year.

MESSRS. R. GEMMELL & SON, Perth, Ont., are now about ready to start up the new 3-set woolen mill just erected by them.

THE thirty-six cars for the Niagara Falls Electric Railway are being built by Messrs. Patterson & Corbin, St. Catharines, Ont.

THE Canada Machinery & Supply Company, of Brantford, have made quite a shipment of planing mill machinery to Doaktown, N.B.

MESSRS. HILLIARD & MCKINLAY, London, Ont., have installed a 25 h.p. Reliance motor to replace the 15 h.p. motor they were using.

THE Royal Electric Company, Montreal, have lately put in a 4-inch centrifugal pump made by Messrs. M. Beatty & Sons, Wexford, Ont.

THE Canada Machinery & Supply Company, of Brantford, Ont., are supplying the engine and boiler, etc., for the new Burnaby grist mill.

MR. CAMPBELL is building a new planing mill at Callendar, Ont. The engine and boiler were supplied by Messrs. F. Tutton & Son, Orillia, Ont.

THE Canada Machinery & Supply Company, of Brantford, are supplying the engine, boiler and saw mill for T. Henry's new mill at Waterford, Ont.

THE Reliance Electric Manufacturing Company, Waterford, Ont., have shipped to the Keegans-Milne Company, Montreal, a 150 light incandescent plant.

TO SHIPPING MANUFACTURERS

**Last Notice . . .
Please Take Notice**

THAT THE

SHIPPING MANUFACTURERS' LIST

**A Cyclopædia of Manufacturers
and Products of Canada**

Will go to press in Thirty Days. All staple articles manufactured in the Dominion of Canada will be found indexed in this work. If your name and address does not appear it is because you have been indifferent to the appeals made through the press, letters, circulars, etc., as well as personal canvassers. The success of this great work is now assured, and

You Cannot Afford to be Left Out

M. J. HENRY, Prop: and Publisher

34 Confederation Life Building, TORONTO

Machinists' Fine Tools

DRILLS, CHUCKS, REAMERS, ETC.

WILEY & RUSSELL
Screw Cutting

TOOLS

RICE LEWIS & SON, Ltd.

TORONTO.

Hamilton Cotton Co.

HAMILTON, - ONTARIO.

DYERS, BLEACHERS,

AND MANUFACTURERS OF

**Warp Yarn, in Beam, Chain or Skein, White or Colored,
Single and Double Yarns, Cop Yarn, Single
and Double Hosiery Yarn in all Colors, in-
cluding genuine "FAST BLACK."**

**PAUL FRIND & CO., Toronto, SELLING AGENTS
For Beam Warps.**

The Dominion Construction Company, Montreal, have lately increased their plant by adding two more hoisting engines, built by M. Beatty & Sons, Welland, Ont.

Messrs. S. TAYLOR & SONS, who bought the 3-sett knitting mill in Merriton, Ont., have made some alterations and have installed an electric plant for lighting their mill.

Mr. A. McPHERSON, Longford, Ont., whose shingle mill was destroyed by fire a few months ago, has a new mill about completed and will start up about April 1st.

Messrs. M. BEATTY & SONS, Welland, Ont., are building two 18 inch centrifugal pumps for the Pelee Island Drainage Works. They will pump 16,000 gallons each per minute.

Mr. JOHN McLEAN, Kilworthy, Ont., is rebuilding his shingle mill. Messrs. F. Tutton & Sons, Orillia, Ont., are supplying him with a new 40 h.p. engine and 60 h.p. boiler.

Mr. T. RONSON, Lindsay, Ont., is adding thirty-one more vats to his tannery, and is putting in a 60 h.p. Brown automatic engine which will take the place of the 15 h.p. engine now running.

Messrs. CHEW BROTHERS, Midland, Ont., are starting a box factory, using the engine formerly running their saw mill, which would be in operation if there was an export duty on saw logs.

The Canadian Webb Company, Niagara Falls, Ont., are adding two more looms to their plant. They are being built by Messrs. Dobbie & Stuart, Thorold, Ont., and are for weaving suspender webb.

Messrs. MARSH & WILSON have started a shingle mill at Dwight Ont. They are using R. Brammer's clipper shingle machines. Messrs. F. Tutton & Son, Orillia, Ont., supplied them with a quantity of machinery.

Mr. W. A. FRASER has bought out the Niagara Casket & Coffin Company, of which he was treasurer. The amount paid was \$35,000 for the building and plant. Mr. Fraser expects to have running in a few weeks.

Messrs. McLAUGHLIN BROS. are building a new steam saw mill

at Arnprior, Ont., which will be in operation by the beginning of April. They will also operate their old mill run by water power, which was idle last year.

The iron sash and window frames for the new asylum at Brockville, Ont., are being made by Messrs. Wright & Cunningham, St. Catharines, Ont. The iron work for the locks on the Gallops canal is also being made by this firm.

The Weddell Dredging Company, Trenton, Ont., are having a large dredge built at Welland, Ont., by Messrs. M. Beatty & Sons. This will be one of the largest dredges turned out of these works. It is to be used on the Morrisburg canal.

Messrs. T. PHILLIPS & Co., Orillia, Ont., have bought the building known as Lloyds foundry, and are altering and fitting it up for a factory to manufacture bee keepers' supplies. They will add more machinery and be running by April 1st.

The Ontario Silver Company, Humberton, Ont., had considerable damage done to their works a few days ago by an explosion of natural gas. Six men were badly hurt, but none fatally. The works will be running again in a short time.

The Knowles, Hearn & Nott Company, of Brantford, Ont., just incorporated, are adding a number of machines to their plant for manufacturing refrigerators. They purchased from the Canada Machinery & Supply Company, of Brantford.

The R. H. Smith Company, St. Catharines, Ont., are now running their saw works with electric power. They have a 50 h.p. Reliance motor, the power being supplied from a Cook & Son's 166 h.p. generator. This company claim that they are the best to grind saws by electricity.

The Alberta & British Columbia Exploration Company are having a very large ditching dredge built for them by Messrs. M. Beatty & Sons, Welland, Ont. It is to be used on the Kootenay district near the boundary line, in building a dyke to reclaim about 40,000 acres of land.

Messrs. HAVILL & WHELAN, of Brantford, have the contract for building the Government drill hall at that place, and for han-

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ding this large contract they are increasing their plant, having purchased a number of machines from the Canada Machinery & Supply Company, of that city.

THE Watson Manufacturing Company, who started a knitting mill at St. Catharines last October, are moving into larger premises and will add a quantity of new machinery. Their first factory was too small and they could not keep up with their orders. They expect to fully occupy their new factory by April 1st.

Mr. W. P. DESPARD, for many years head accountant of Messrs. Frost & Wood, of Smith's Falls, Ont., has resigned that position to take the secretaryship of the new Worsted and Braid Company, at Toronto Junction. This gives Mr. Wardlaw's whole time to the manufacturing branch, which was growing so fast as to need it.

THE St. Catharines, Merritton and Thorold Electric Railway will extend their road this spring to Port Dalhousie. They will also relay the old track and change their system to the trolley. They intend having Edison generator and Thompson-Houston motors. The new cars, which were built by Messrs. Patterson & Corbin, St. Catharines, are now ready for use.

A SYNDICATE, composed of Messrs. Wm. Hendrie and Robert Thompson, of Hamilton, and John Davies, Dr. Coventry and McKee & Anderson, of Windsor, have bought the Sandwich, Windsor and Amherstburg Electric Railway for \$156,000. They have

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also bought the electric light plant and the Boomer horse car line, which latter they intend operating with electric power.

THE Truro Condensed Milk & Canning Company, Truro, N.S., manufacturers of the well known "Reindeer" brand of condensed milk, coffee, cocoa, tea, etc., are adding new machinery by which they hope, without increasing the cost, to improve the quality of their already excellent products. Professor Robertson pronounces "Reindeer" brand of condensed milk superior to the famous Swiss article.

MESSRS. ISAAC USHER & SON, Thorold, Ont., occupy a liberal space in our advertising pages in directing attention to the Queenston cement manufactured by them. In a tabulated statement they show the results of tests made of their cement and that of other brands. These tests were for average tensile strength of briquettes made of neat cement of the consistency of mortar submerged in water for varying periods from seven days to twelve months; and for similar briquettes rammed in moulds for similar periods. These tests were made by the Government during the progress of the work at Kingston graving dock in 1892 by Mr. Louis Coste, acting chief engineer, Ottawa.

MR. W. R. SCOTT, 489 Church Street, Toronto, has recently purchased the plant and stock of the Gurd-Brandon Woodenware Company, of Toronto, who went into liquidation some time since, and is now offering the whole at bankrupt prices. Owing to some difficulties in the lease of the company's old place of business, Mr. Scott was compelled to erect a warehouse and move the machinery, etc., which was done in the short space of eight days; and he now has one of the best and most complete show rooms in Toronto at the location indicated, where he will carry on business in bankrupt stocks, etc., and will always have on hand a goodly supply of high grade machinery, which he will offer for sale at very low prices.

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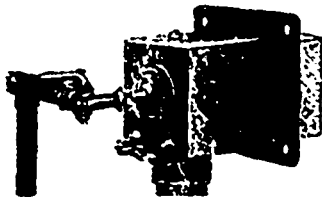
HAMILTON, ONT.

Write for Catalogue and Prices.

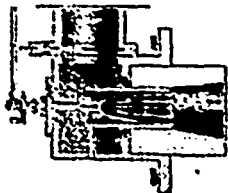
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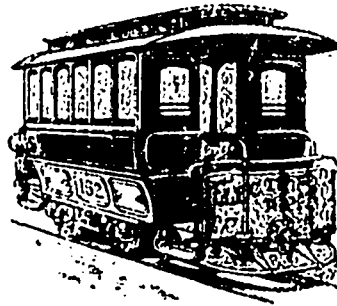
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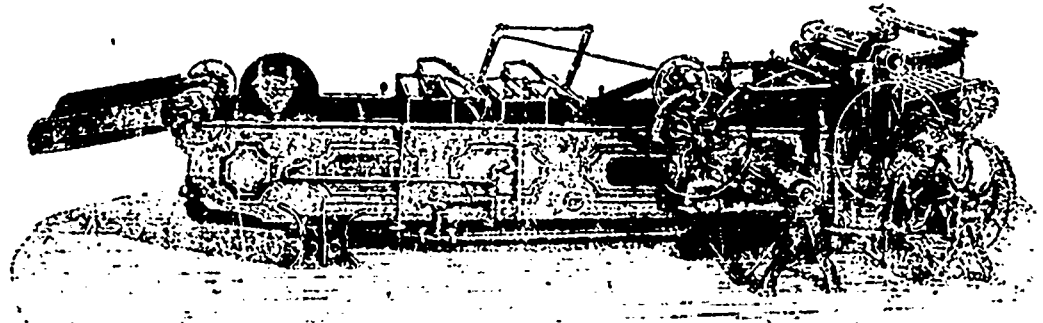
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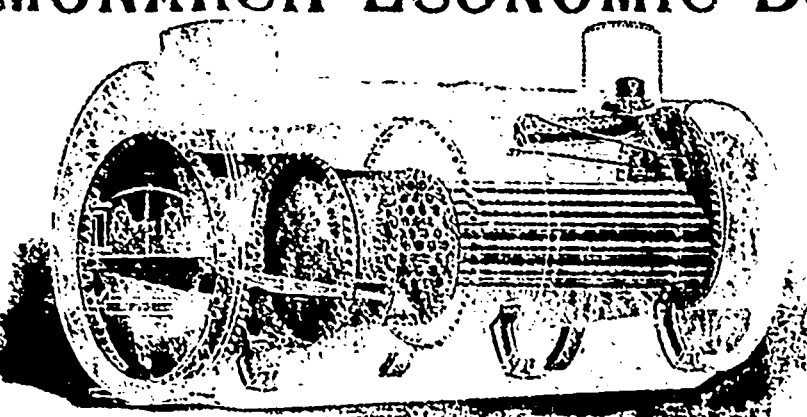
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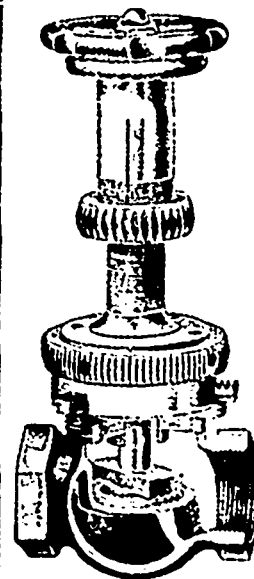
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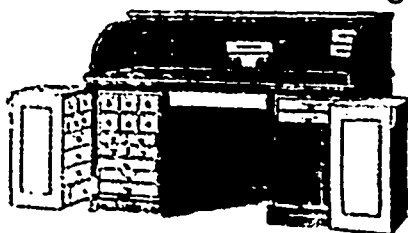
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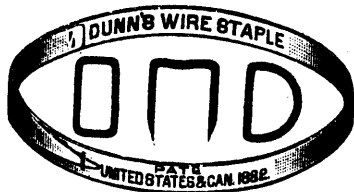
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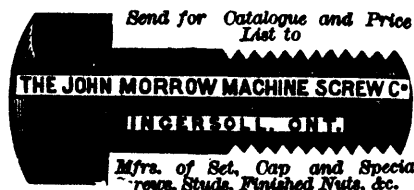
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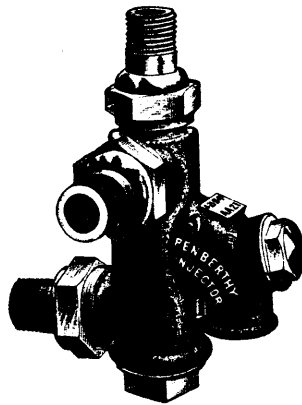
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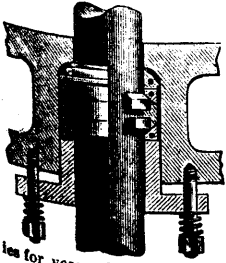
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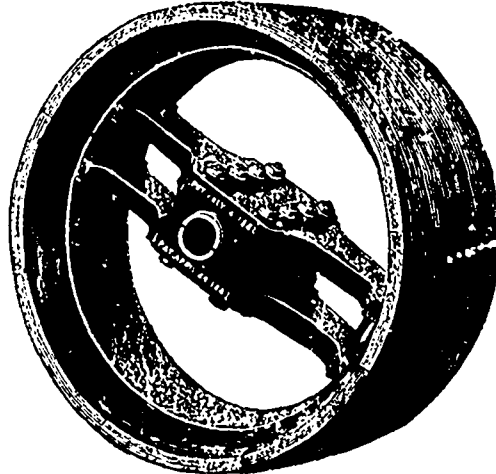
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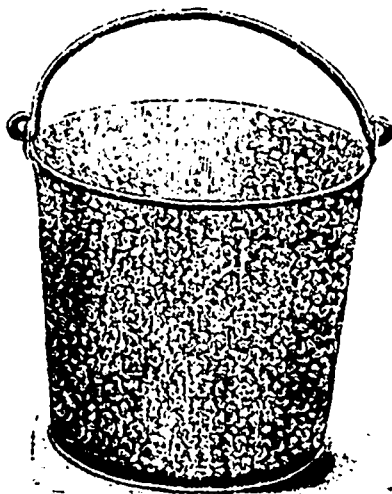
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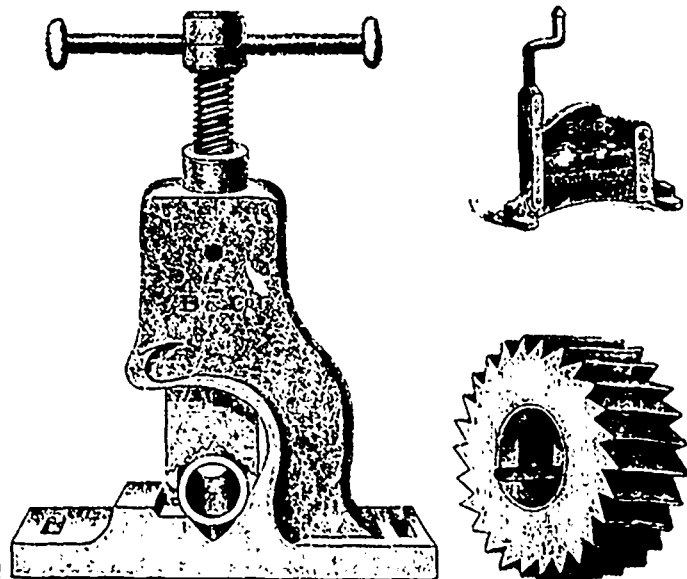


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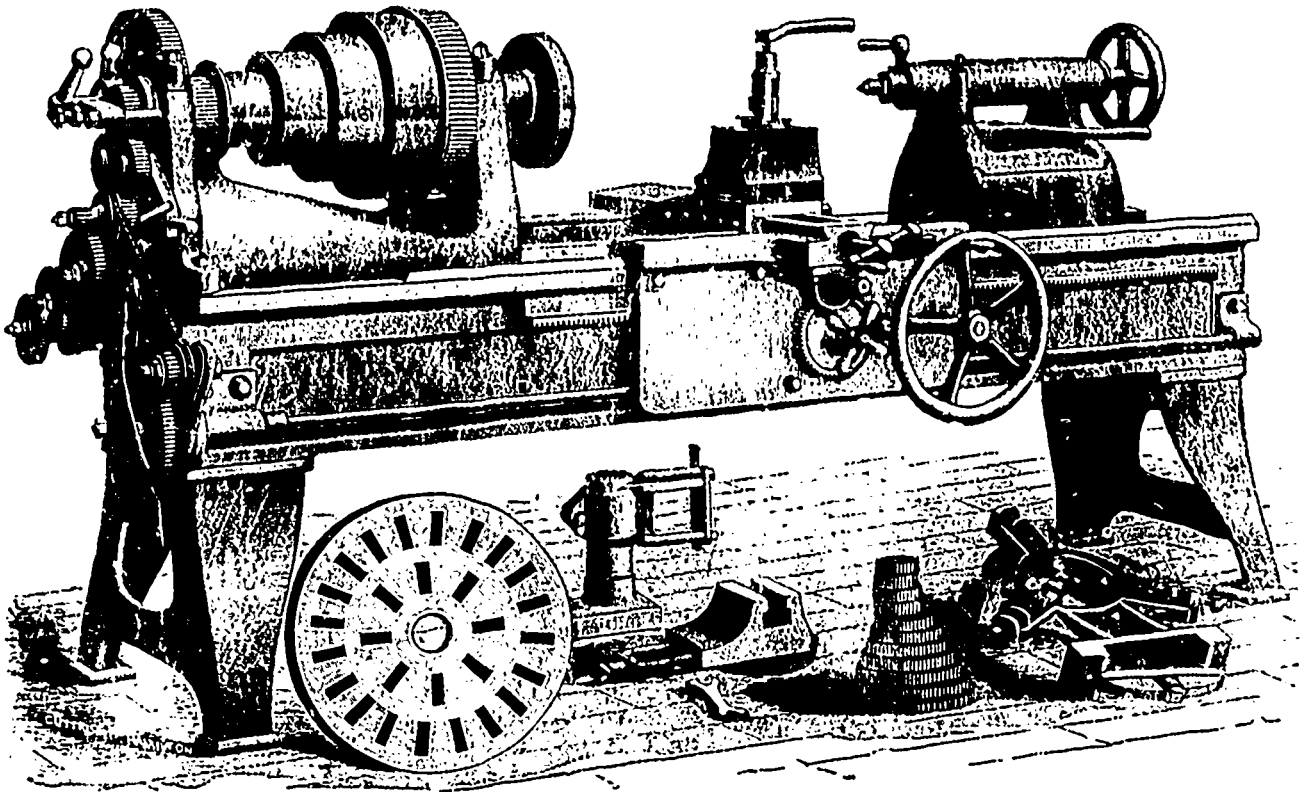
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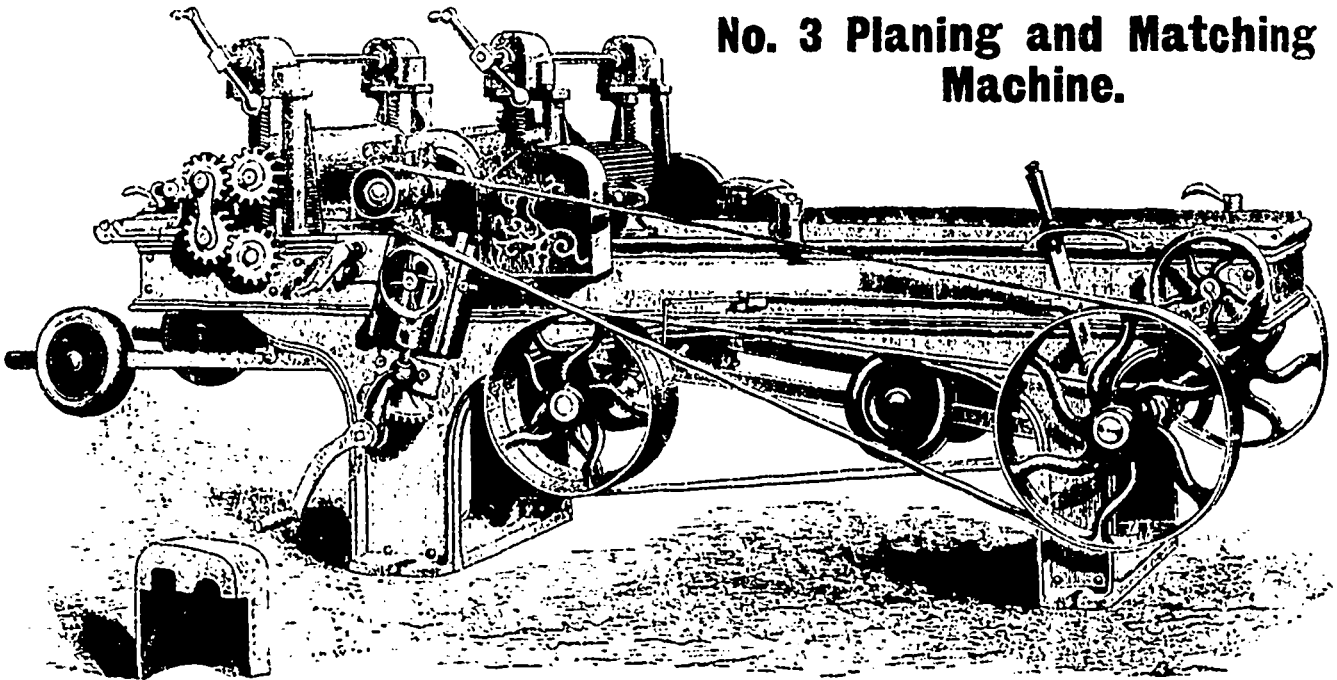
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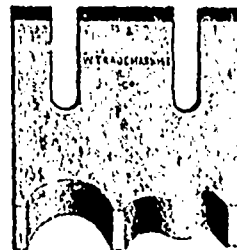
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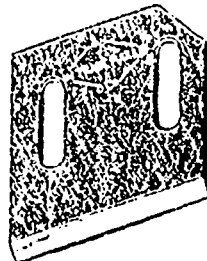
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THE OBJECTS OF THIS ASSOCIATION ARE:

- To secure by all legitimate means the aid of both Public Opinion and Governmental Policy in favor of the development of home industry and the promotion of Canadian manufacturing enterprises.
- To enable those in all branches of manufacturing enterprises to act in concert as a united body whenever action in behalf of any particular industry, or of the whole body, is necessary.
- To maintain Canada for Canadians.
- Any person directly interested in any Canadian manufacturing industry is eligible for membership.

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

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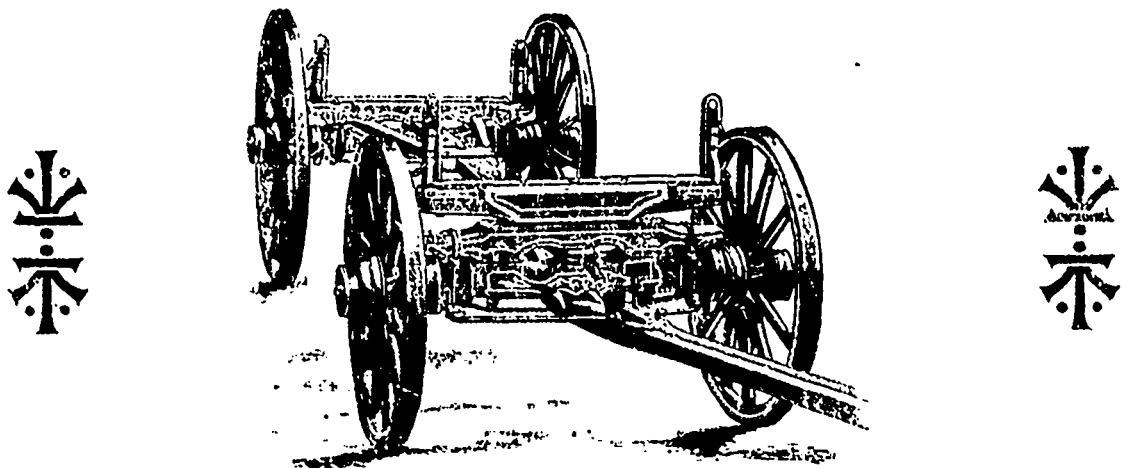
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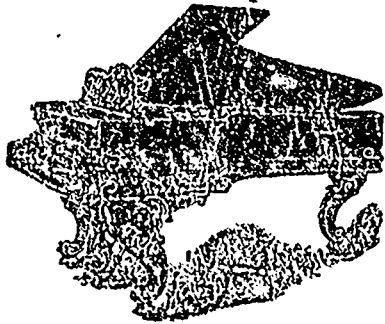
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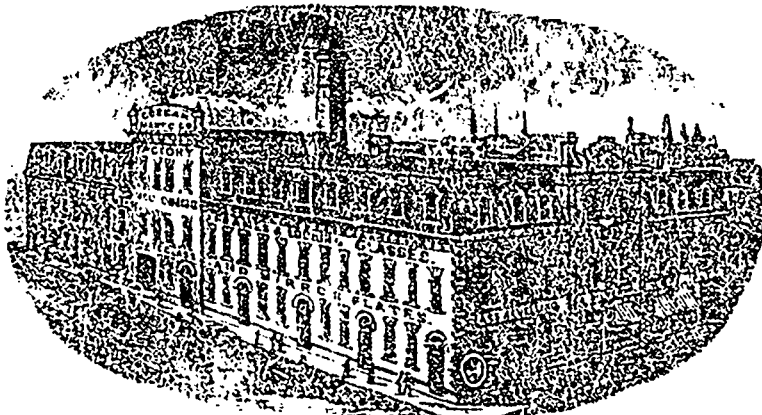
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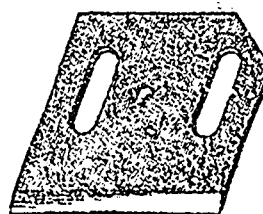


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