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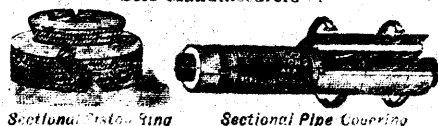
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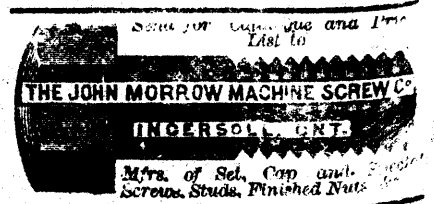
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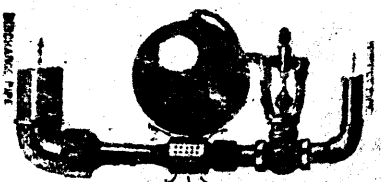
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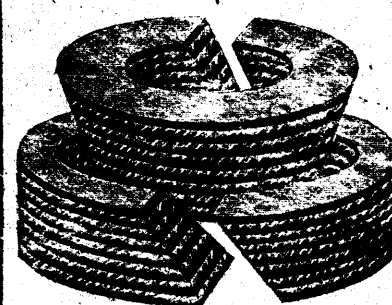
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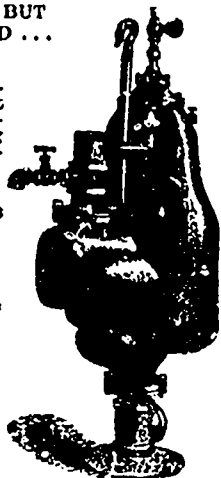
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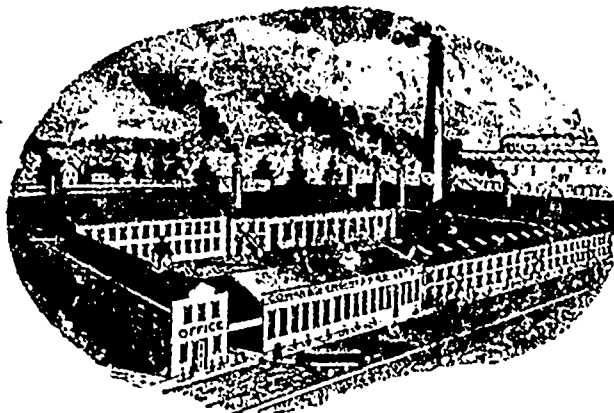
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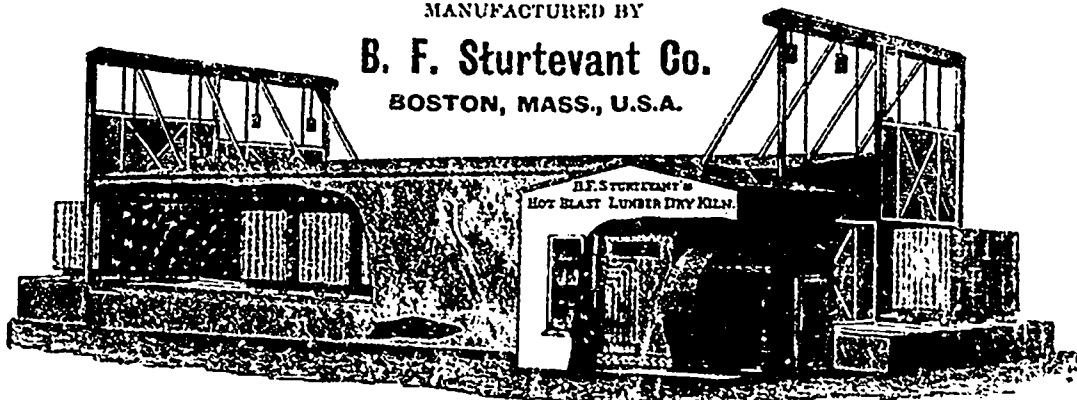
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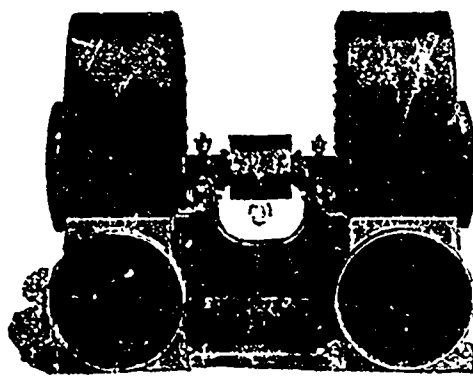
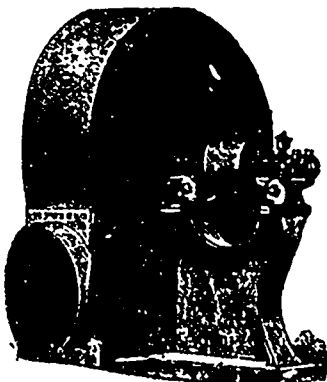
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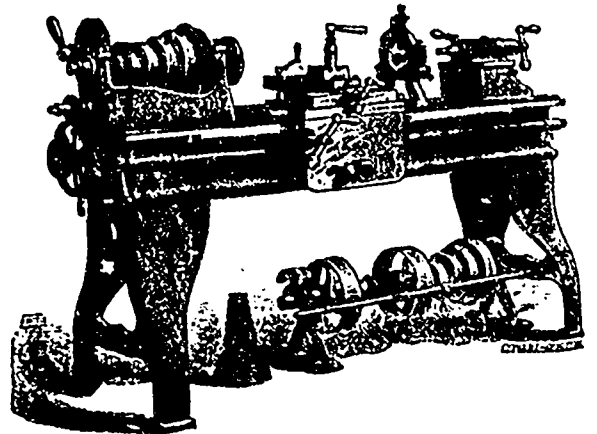
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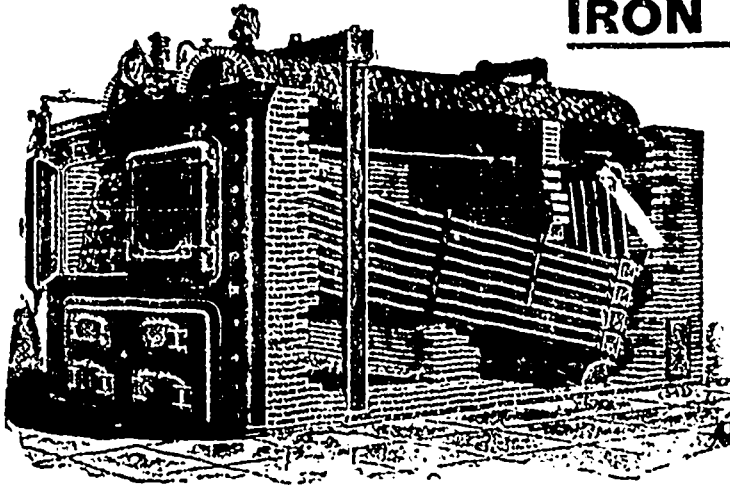
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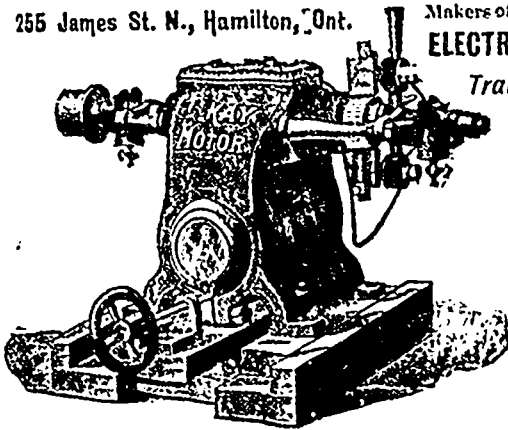
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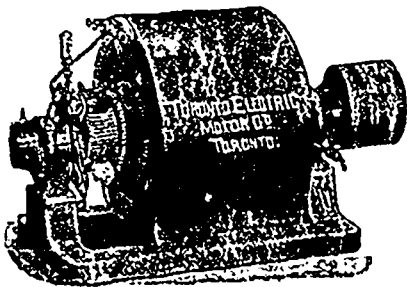
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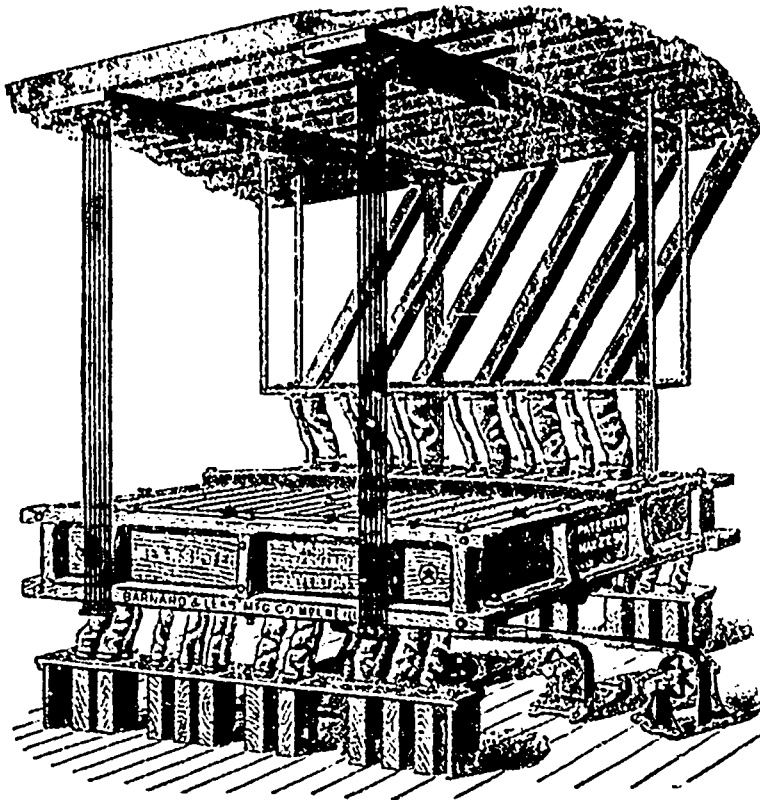
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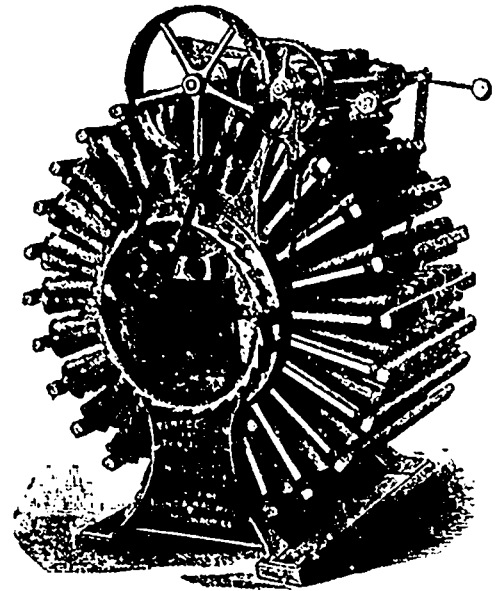
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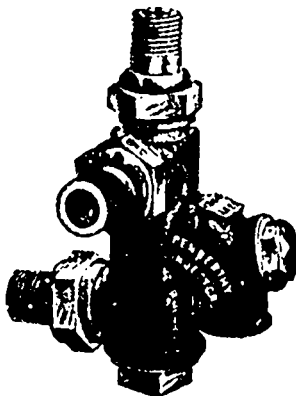
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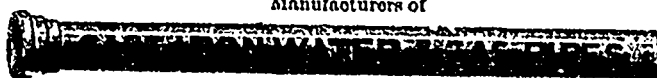
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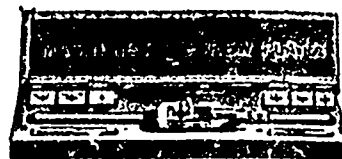
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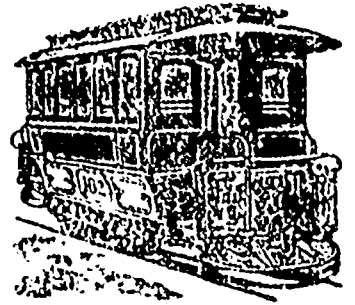
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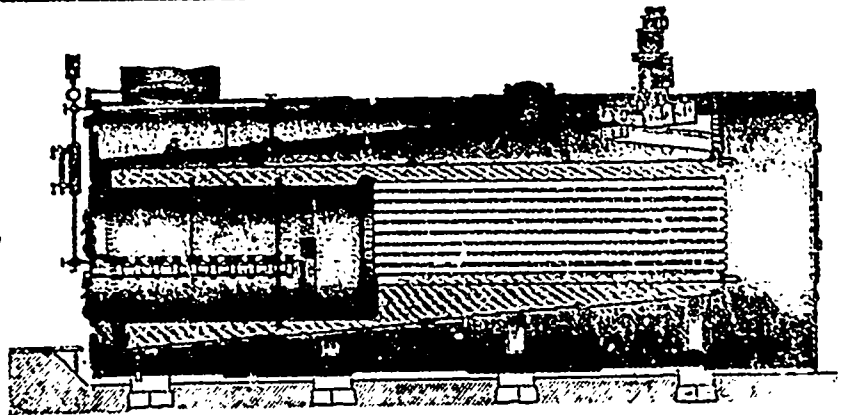
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OUR DOMINION EXPENDITURE.

So much mischievous misrepresentation and exaggeration have been indulged in by unscrupulous agitators with respect to the alleged fearful increase in the annual expenditure of the Dominion, that THE MANUFACTURER has felt that it may be interesting to its patrons to submit a careful and candid statement as to the true position of the country. This is the more necessary because so few have access to the records, and very few indeed have the leisure necessary to a thorough investigation of the subject. With this view the following tables and statements have been compiled from the public accounts, from which will be seen not only the

large number of the purposes for which the expenditure is incurred, but the almost constant increase in the requirements for the various services of the Dominion...

DOMINION EXPENDITURE ON ACCOUNT OF CONSOLIDATED FUND EXCLUSIVE OF CHARGES ON PUBLIC DEBT.

	Average 5 years 1874-75 to 1878-79.	Average 5 years 1879-80 to 1883-84.	Average 5 years 1884-85 to 1888-89.
Administration of Justice	\$364,712	\$549,982	\$738,812
Arts, Agriculture and Statistics	9,719	60,138	198,306
Civil Government	712,080	\$19,599	1,347,597
Fisheries	85,318	89,330	407,368
Geological Survey and Observatories	60,214	98,636	132,255
Immigration	155,388	251,413	170,311
Quarantine	20,339	33,684	89,020
Indians	53,180	336,850	982,928
Insurance Superintendence		8,160	8,375
Legislation	505,692	632,310	879,258
Lighthouse and Coast Service	385,499	483,581	188,100
Mail Subsidies and Steamship Subventions	313,307	275,908	362,256
Marine Hospital	46,288	59,625	57,109
Militia and Defence	1,235,981	787,752	1,397,419
Miscellaneous	92,550	80,628	211,034
Mounted Police	199,599	347,085	684,549
North-West Territories Government	12,729	16,646	245,619
Ocean and River Service	84,743	176,809	189,156
Penitentiaries	260,504	313,872	568,003
Pensions	54,821	100,005	96,187
Police	46,505	20,217	21,562
Public Works	926,801	1,395,514	1,899,965
Railways and Canals	109,451	692	200,928
Steamboat Inspection	9,555	13,166	23,247
Superannuation	42,293	190,774	252,513

COLLECTION OF REVENUE.

Adulteration of Food	5,316	23,926
Culling Timber	70,900	62,267
Customs	565,926	711,905
Dominion Lands	183,784	133,597
Excise	154,079	210,972
Inspection of Staples	1,082	2,019
Minor Revenues	28,249	22,749
Post Office	1,001,768	1,671,673
Public Works	97,190	125,025
Railways and Canals	1,209,612	2,212,639
Weights, Measures, Gas and Electric Lights		92,266
Total	9,098,794	12,331,699

In addition to the above, there are a few items of expenditure which occurred periodically, but not annually, so that they do not afford any basis for comparison:—Boundary Survey, Census, Dominion Forces, Manitoba Settler's Relief, Manitoba Liquor License Act. From the above totals deduct items marked "a," as not affording a fair comparison, because not in existence for full period of five years....

212,328	470,555	1,053,519
\$,886,466	11,861,144	19,222,361

The percentage of increase in expenditure during the five years 1874-75 to 1878-79 over the five years 1884-85 to 1888-89 was a fraction over 33%.

If a like increase had occurred in each succeeding period of five years the average for five years ending 1883-84 would have been \$15,814,859, for the five years ending 1888-89, \$21,086,479, and for the five years ending 1893-94, \$28,115,305, or about \$8,300,000 more than it actually was.

During the five years of Mackenzie administration,

ance of that enterprising policy which has enabled Canada to pass through the last few years of almost universal depression, with less suffering than any other country in the world.

THE OTTAWA CANAL.

This is a river, lake and canal route which passes from the easterly side of Lake Huron up the French River to Lake Nipissing, from thence by canal across the high lands to Trout Lake, at the head of the Mattawan River, down the Mattawan to its junction with the Ottawa, following the course of the latter river to Lachine, and thence by Lachine Canal to Montreal. The distance from the entrance at French River to Montreal is 430.76 miles of which 29.32 miles are canal, and of this the Lachine Canal already completed, forms 8.50 miles, leaving only about twenty-one miles of canal to be constructed.

In the Annual Report of the New York Produce Exchange, 1872-73, there is a voluminous paper on the different projects of rail and water communication which were then being discussed: a ship canal via Welland Canal and St. Lawrence route to Montreal; a ship canal from Cauchawaga via Lake Champlain and Hudson River to New York; a ship canal from Georgian Bay to Toronto; a ship canal from Niagara River to Lake Ontario, and from Oswego to New York; a canal from Lake Huron to Montreal, via the Ottawa River, and a moderate enlargement and improvement of the Erie and Oswego canals.

The whole of the ship canal projects are condemned as impracticable and unprofitable, because the cost of their construction involves an annual amount of interest which would largely exceed any saving in the cost of transportation that could be effected on even an extreme estimate of possible traffic; and if the total saving in freight is to be less than the interest, where is the gain? The report decides in favor of a moderate enlargement of the Erie and Oswego canals, which can be accomplished at a reasonable cost, and so as to reduce cost of transportation from Buffalo to New York by fully 50 per cent.

In discussing the Ottawa Canal, the report speaks of this scheme as being the first in magnitude, and evidently anticipates danger from its competition with the traffic of New York via Erie Canal. It shows that the saving of distance between Chicago and Liverpool by this route, as compared with the circuitous route via Buffalo and New York is 842 miles; and that the distance to Liverpool is 428 miles less than by the route via Welland Canal to Montreal.

It is maintained by the friends of the Erie Canal route, that when the present improvements are completed, wheat can be carried from Buffalo to New York, including elevating and shipping charges at Buffalo and New York, for three cents per bushel. If wheat can be carried from Lake Huron to Montreal via the Ottawa Canal for the same price—three cents per bushel—this route will command a large proportion of the trade, because it will be the most expeditious route, and because, especially in midsummer, the grain will be kept in better condition when carried through deep and cool waters than when transported through the shallow and hot water of the Erie Canal. Can grain be carried for above rate? There is no difficulty in making the locks on proposed canal (except on Lachine portion), of sufficient dimensions to pass

at one lockage a fleet consisting of a steam tug and three barges, holding altogether 180,000 bushels. One of the oldest and best informed forwarders in Canada estimates that each fleet of one steam tug and three steel barges can be constructed for \$150,000; that the trip from French River to Montreal can be made in from four to five days; and allowing for delays in loading and unloading, the round trip should be accomplished within fifteen days; the expenses for the round trip, for wages, board of men, fuel and supplies for fifteen days, \$1,250. Allow fifteen per cent. per annum on the cost of the fleet for interest on cost, wear and tear, repairs, insurance, etc., \$22,250, or allowing fourteen trips in the season, is equal to \$1,589 on each round trip, which added to the \$1,250, for expenses, as above, makes cost of transporting 180,000 bushels wheat \$2,839, or 1.57 cents per bushel. This makes no allowance for any revenue to be obtained from freights from Montreal or other points on the trip westward. On the other hand there may be slack times during the season, when the fleets are not fully occupied, and there may be occasional delays which may make the round trip longer than estimated. But, taking both considerations into account—return freights and unexpected delays—it may be fairly assumed that one and three-quarter cents per bushel will fully cover cost of transportation and afford a reasonable profit on the cost of the fleets. Allowing one and one-quarter cents per bushel to cover elevating and shipping charges at the harbor at French River and at Montreal, and for canal tolls, makes total charge for conveying wheat from Lake Huron to delivery on board sea-going vessel at Montreal, three cents per bushel. Allowing one-half cent per bushel for elevating at both ends of the route, this would leave three-quarter cent per bushel canal tolls, which, with proportionate tolls on other merchandise, would yield a very respectable revenue towards paying for maintenance of the works and for interest on their cost.

Comparing the passage from the west to the ocean via the Ottawa Canal route with that to New York by the Erie Canal, the former is not only the most expeditious, but the cost of transportation is so much less, that the traffic can bear the imposition of a fair rate of canal tolls, which the Erie route cannot.

Comparing the route via Ottawa Canal with that of a ship canal via Welland Canal and the St. Lawrence, the following may be considered a fair test. At least $\frac{1}{2}$ cent per bushel must be allowed for extra freight and insurance on the longer trip from Lakes Michigan and Superior to Port Colborne, as compared with the shorter trip to French River. As the cost from French River to Montreal, including elevating and tolls, will be three cents per bushel, then in order to compete, vessels by the ship canal route have only $2\frac{1}{2}$ cents to get for freight and insurance from Port Colborne to Montreal, even if free from tolls, and, if subject to $\frac{3}{4}$ cent per bushel as proposed on Ottawa route, only $1\frac{3}{4}$ cents. No one pretends that this route would prove remunerative to vessel owners. It may be said that in this comparison, no allowance is made for the cost of elevating at French River. With the large business likely to be done, the cost of this service should not exceed $\frac{1}{4}$ cent per bushel; and it is generally admitted that in the summer season at any rate, the condition of grain is improved by each elevation to an extent fully equal to the cost of elevating.

Comparing the Ottawa route with the proposed ship canal from Georgian Bay to Toronto, and admitting that the doubts as to ample supply of water for the latter from Lake Simcoe, and as to the stability of the high banks through its deep cuttings should be dispelled, and the feasibility of the project in these respects established, there remain the questions of relative cost of construction and economy of transportation.

Without anything like reliable data as to the cost of construction in either case, it would be reasonable to estimate that the cost of the Georgian Bay Canal would largely exceed that of the Ottawa route. But assume the cost to be the same, the Georgian Bay Canal would be practically useless until the channel of the St. Lawrence river and the St. Lawrence canals should be deepened to correspond with the former. To justify the construction of a ship canal from Georgian Bay to Toronto its advantages must evidently be of sufficient value to warrant the additional expenditure required between Toronto and Montreal. With six short canals between Kingston and Montreal to be passed through, it is very doubtful whether grain or any other merchandise could be transported even from Toronto to Montreal by the class of propellers adapted to that route, as cheaply as they could be by barges over the whole route from French river to Montreal. If so, this would leave absolutely nothing for freight or tolls on the 100 miles canal from Georgian Bay to Toronto.

The Ottawa canal is no new project. It was discussed nearly fifty years ago, and a survey and report were made by Mr. Walter Shanley in 1858, and another survey was made in 1860 by Mr. Thomas C. Clark; but as conditions have greatly changed since then, these surveys and estimates are of little value beyond establishing the practicability of the scheme. With respect to its merits, the late Sir John A. Macdonald thus spoke at a public dinner given in his honor, at Ottawa, in 1865: "Just as sure as the legislature is settled here, and they see this portion of the country, just so surely will be carried out the great scheme of connecting Lake Huron with the Ottawa. The subject has pressed not only upon the attention of colonial public men, but it is impressed also upon the attention of British statesmen." On another occasion he said: "The Ottawa ship canal must be constructed, and no voice would be raised against the great national work, which would open the Western States and Colonies to the seaboard." The late Hon. Alexander Mackenzie from his place in parliament expressed himself as being "perfectly satisfied that the Ottawa Valley presented the greatest facilities of any route upon the Continent for the transportation of products of the North-West to the Atlantic ocean, or rather to the head of Atlantic navigation." Mr. McLeod Stewart, the chief present promoter of the work, gives the following valuable testimony to the feasibility of the project, from Mr. A. M. Wellington of "Engineering News," New York: "I do not care to go into the details of the Ottawa project at the present time, any more fully than I have already done. My conviction that the Ottawa river affords the best opportunity on the globe for a well-planned ship canal, is a fixed one."

The idea of a great ship canal and lake and river route to the seaboard is a magnificent and attractive one on paper. Tested by a comparison of probable practical results with cost of construction, it is a visionary one. After all, what great

direct or indirect advantage would accrue to the greater part of Canada from its construction and operation? The immense vessels employed would be unable even to touch at the harbors on Lake Erie and Ontario. If by constructing the canal system from Lake Huron to Montreal via the Ottawa, Canada can attract as much foreign traffic as by the more magnificent but much more expensive ship canal project. This of itself should ensure the adoption of the former. When to this consideration is added the incalculable advantages which will be derived by the settlers on both sides of a 400 mile channel of navigation; the additional value that will attach to the lands, timber, minerals and farm products of the immense territory tributary to it; the lateral railways that will be built; the vast water powers brought into use, and the new industries established; the following results will be realized which have been realized elsewhere: "Complete this national water system—with the railway system as feeder to it—and the results attained will be so magnificent as to claim the admiration of the world; so attractive as to invite to us its best people and its greatest wealth, and so powerful for good as to bind the country together in indissoluble bonds for all time."

THE MANUFACTURER has formerly expressed its surprise and regret that Government and parliament have displayed so much indifference to this promising enterprise as to surrender the control of it to a private corporation. It seems almost incredible that parliament should delegate such powers to any company, however wealthy; powers that may affect the prosperity of tens of thousands of the settlers along its banks, may destroy one town or build up another, may favor one section and retard another. All this granted to a company on paper, which did not produce a particle of evidence of financial ability to proceed with the work, and whose only hope of being able to proceed lies in the prospect of obtaining Dominion and Provincial aid. The negligence in allowing the charter is only equalled by their culpability in omitting to protect the public under the conditions of the Act. It is provided that the tolls to be levied by the company are to be subject to the approval of the Governor in Council. But the company is authorized to sell or lease any terminals, harbors, wharfs, docks, piers, elevators and warehouses which they may construct. Government may compel only reasonable tolls to be levied on grain or merchandise transported upon the canals, but if the wharves and elevators are leased or sold by the company, how can Government regulate any charges which may be imposed for wharfage, elevating, storage, etc. It may be that the company will, in ordinary seasons, be compelled to maintain reasonable tolls, but there have been seasons in former years, and there may be such seasons in time to come, when every channel of transportation is crowded with freight.

The granting of a charter for this great work to any company has been a great mistake, and the granting of a charter with such conditions as this one contains was a greater mistake. Fortunately this Act of Incorporation has expired through non-fulfilment by the company of the conditions contained in it. An application is before parliament for its revival. The answer should be, "It is dead, there let it lie."

Carpenters in Japan earn on an average about 34c. per day, measured in American money.—Cleveland Leader.

COMMERCE BETWEEN CANADA AND THE UNITED STATES.

The Trade and Navigation Tables of the Dominion of Canada are very defective, inasmuch as it is found that a large proportion of the exports to the United States are not reported at the inland custom houses, although there is a law which makes this duty imperative. Owing to the absurd regulations for enforcing this duty, it is very generally neglected. Up to the year 1892-93 the United States' returns of exports to Canada were still more defective, because prior to that year United States exporters were only required to report to customs office, such exports as went by water. Hence, the great bulk of the exports by rail to Canada were not reported at all. To remedy this it was the custom of the Bureau of Statistics at Washington to publish in each September bulletin, a statement showing total values of merchandise imported into the United States from the British American Possessions per United States returns, and total value of merchandise imported into British American Possessions from the United States per Canadian returns. The following table is compiled from Quarterly Report No. 1, 1892-3 of the Bureau of Statistics, Treasury Department, Washington, see page 125 :

	Imports into United States from B.N.A. Possessions.	Imports into B.N.A. Possessions from the United States.	Excess of Imports into the B.N.A. Possessions.
1883.....	\$44,740,876	\$65,018,933	\$20,278,057
1884.....	39,015,840	59,845,968	20,830,128
1885.....	36,960,541	53,397,608	16,437,067
1886.....	37,496,338	49,773,232	12,276,894
1887.....	38,015,584	51,937,050	13,921,466
1888.....	43,084,123	54,706,161	11,622,038
1889.....	43,009,473	57,412,887	14,403,414
1890.....	39,396,980	61,671,070	22,274,090
1891.....	39,434,535	59,340,058	19,905,523
1892.....	35,354,547	64,185,640	28,851,093
Totals	396,438,837	577,286,607	180,797,770

The trade between the United States and Newfoundland is included in the above, but this does not materially affect the comparison, as may be seen from the following :

The imports into the United States from the Dominion of Canada alone, were in 1891-92, \$34,954,203. The imports into the Dominion of Canada alone, from the United States, \$62,599,439.

In the above ten years Canada imported over 45 per cent. more merchandise from the United States than it exported to that country. Notwithstanding this, Canada was the only country specially excluded from the general reciprocity act of Mr. Secretary Blaine. Yet the Premier of the Dominion and the party which supports him are mad enough to expect to make a fair and honorable commercial treaty with a country which takes every opportunity to display its hostility towards Canada. The United States is quite willing to sell to us all we may want to buy, but is resolved to buy nothing from us which they can get elsewhere.

A well-known Parisian engineer, who has been studying our street railways for some time, predicts that compressed air motors will prove a failure. He also thinks that the trolley system is a better mode of locomotion. Thanks. It is pleasant to have an opinion respected and repeated. —The Electrical Review.

RECIPROCITY.

A reciprocity treaty between one country and another country, or between one country and several countries, in order to prove satisfactory and enduring, must be based upon terms of mutual advantage, and, as nearly as possible, of equal advantage to all concerned. By the term reciprocity is understood preferential treatment, under which each of the contracting powers agrees to bestow to the other preferential treatment of its products, as compared with those of other countries not included in the arrangement. The value of this preference is evidently to be found in the extent to which additional markets and increased prices are to be obtained under the mutual agreement. It would be no advantage to either of the contracting parties, that through such a treaty, its sales to the other should be largely increased, if such increased sales merely meant a corresponding reduction of its former sales to other countries, unless in the former case better prices were realized than could have been in the latter. When a country like the United States makes reciprocity treaties with West Indian, Central and South American countries, under which it agrees to admit all their sugar, coffee, fruits, hides, etc., free of duty, or subject to a lower duty than when imported from any country outside of the agreement, it is evident that the value of this concession must almost entirely depend upon the ability of the United States to absorb the whole surplus of such products raised in all the countries included in the treaties. If it cannot afford a market for all these products, so that twenty-five per cent. of them must be sold elsewhere, there will be such anxiety to get into the United States market that the prices realized for the seventy-five per cent. would soon fall to the level of the value of the twenty-five per cent., just as in the case of wheat, where although the home consumption for food and seed absorbs seventy-five per cent. of an average crop, the value of this large percentage is governed by the export value of the smaller percentage. As the United States is the largest sugar and coffee consuming country in the world, it was natural that sugar and coffee producing countries should be very anxious to be included in the reciprocity system proposed by the former country. Their mistake was in failing to note that the United States was promising to grant a preference for a much larger quantity and value of products than it was able to consume.

The result has been that countries outside of the system have been in a better position than those inside. They realized just as good prices for their exports, and were not hampered by any treaty stipulations as to their tariff, under which they were compelled to purchase certain articles from the United States, admitting the same free of duty or at a preferential rate, when they could have obtained the same goods from other countries at the same cost, after securing a greater customs revenue. So far as the countries in the West Indies and Central and South America are concerned, the reciprocity treaties did not conduce to their advantage, and very little, if any, regret has been expressed over their termination. Did they prove of much advantage to the United States? Mr. Blaine boasted of great advantages that were to follow. The large adverse balance of trade which had previously been experienced in the commerce with these countries was going to be greatly reduced, if not entirely wiped out, and an immense increase accomplished in the sales of United States agricultural products and manufactures. Mr. Blaine had implicit reliance

on the theory that trade begets trade, which is true in the abstract; but like all theorists, he failed to see that largely increased purchases from these countries to the south might not necessarily produce equally large increased sales to these countries, which might, as it has turned out that they actually did, employ the money which they obtained from their sales to the United States, in purchasing manufactured goods, etc., from countries which Mr. Blaine expected to supplant.

In 1889-90, prior to reciprocity, the balance of trade against the United States in its commerce with these countries was \$108,054,472. In 1892-93, during reciprocity, so far from having been diminished or wiped out, this adverse balance had increased to \$151,961,632. In 1889-90, the United States purchased from these countries \$2.19 worth of merchandise for every dollar's worth sold to them; in 1892-93 this proportion had increased to \$2.45. The immense increase in exports which was predicted only amounted to \$14,000,000, while the imports increased \$57,000,000.

Like some of our Canadian politicians who have reciprocity on the brain, Mr. McKinley, in his letter accepting the Presidential nomination, feels it his duty to say a few words in favor of this part of the party platform, and, in order to establish his point, selects for illustration the only one of all the countries which makes anything of a favorable showing—Cuba. Even here he omits to give details, but deals in generalities. The real position is as follows:—

Exports from the United States to Cuba, twelve months ending Aug. 31, 1891, \$11,920,214; Aug. 31, 1892, \$19,681,729; June 30, 1893, \$17,878,889; June 30, 1894, \$14,789,922.

There was for the first two years of the treaty, a little gratifying increase, which was followed by a sudden decrease. In three years, the net increase in exports was a little under \$5,000,000. Of the exports in 1893-94, about \$11,000,000 consisted of agricultural products, flour, corn, bacon, hams, lard, etc.; some coal, oils and lumber. Will anyone pretend that exports of eleven million dollars to Cuba increased by even one per cent. the value in the United States of such produce? This leaves about \$4,700,000 for value of manufactures, etc., exported to Cuba, principally steam engines, \$2,094,508; carriages and railroad cars, \$158,738; sewing machines, \$212,696; iron and steel manufactures, \$438,720, etc. With or without reciprocity, the United States would have supplied Cuba with these articles. Mr. Harrison is presuming upon the well-known indifference of the business men of the United States on this subject, and their general aversion to investigate statistics, when he undertakes to speak so favorably of a defunct policy which could hardly find a defender during the session of Congress that adopted the tariff which abrogated reciprocity.

The British Trade Journal, London, Sept. 1st, in one of its editorials says:—

"One of the crying wants of the day is the presence in the House of Commons of business men. The less of the professional politician type, and the more we have of business men the better for the House and for the Empire."

Referring to many important, commercial questions, which demand immediate legislation, the Journal says:—

"All these are relegated to the dim and distant future, because Parliament, instead of being a working assembly, has

become a collection of aspirants for social favors, or the prizes which fall to the astute politician and wire-puller."

Everywhere in the United States and in Canada, there is the same complaint and the same desire for change. But so long as the mass of the electors esteem stump ability above business experience, just so long will such questions as reciprocity, tariffs, transportation, etc., be bungled by men who can only view them as tributary, or otherwise to party success.

In view of the miserable failure of Mr. Blaine's grandiose scheme for extensive reciprocity, and the almost universal indisposition and hostility displayed by the politicians and press of the United States towards Canada, it becomes our Government and representatives in Parliament to exercise the greatest caution and deliberation in the consideration of any policy of reciprocity with that country.

LUMBER AND SPRUCE PULP.

The North-eastern Lumberman, Sept. 5th, has some interesting items on the lumber trade. It reports that at St. John, N.B., 10,000,000 feet of deals, etc., had been shipped during the previous week to British ports; and that Maine mills were seeking an outlet in England, the Bangor and Penobscot mills having sold many million feet of English deals or three-inch spruce, and are now at work for the English market. Spruce timber lands in New England are rapidly advancing in price, and spruce lumber would be much higher but for the competition of hemlock and Southern pine. The Lumberman speaks of an increasing demand for "excelsior" or "wood wool" for packing purposes, particularly from Great Britain. This is usually made from basswood.

Some important information is given relative to the lumber trade between the United States and Uruguay and the Argentine Republic, as shown in a report of Mr. Edgar Schramm, U. S. Consul at Montevideo.

The annual capacity of the mills in the United States which make chemical fibre and ground wood pulp is estimated at 1,426,350 tons, of which ground wood pulp is about 840,000 tons. If output of mills is calculated at twenty per cent. less than capacity, about 700,000 cords of pulp wood are consumed, and for sulphite pulp at two cords per ton for 480,000 tons pulp 960,000 cords wood are consumed, making altogether 1,660,000 cords of spruce wood as annual requirements. In fifteen years, the ground wood pulp business has increased 1058 per cent. The Lumberman asks, What is to be the result of the increasing demand for spruce? It says, "This is becoming a still more serious question, from the fact that there can be little doubt that Canada will be forced to place an export duty on pulp wood. There seems to be little doubt now in the minds of those most conversant with Canadian affairs, that during the coming fall or winter, an export duty of at least \$2.00 per cord will be imposed by the Dominion authorities. However much the Government may be opposed to the placing of this export duty upon pulp wood, yet they are driven to it in the protection of their manufacturers of pulp and paper, who now complain that the United States mills are supplied by cheap pulp from Canada, while the Canadian mills are forced to pay an import duty on any pulp or paper which they may desire to ship into the United States. Canada sees that no country excels her opportunities for making pulp and paper, by reason of cheap spruce, abundant

water powers and low-priced labor. It is estimated that fully 400,000 cords of spruce pulp wood are now annually imported into the United States."

THE MANUFACTURER has persistently contended that an export duty should be placed on all pulp wood exported to any country which imposes a duty upon Canadian pulp. The propriety of admitting wood pulp free of duty into any country where it is used must be obvious, even to a thorough protectionist. The saving in freight on the manufacturing article as compared with that on the wood itself is more than the cost of manufacturing the pulp, so that it is poor economy to force the manufacture out of its natural course. Jealousy of Canadian resources, and a disposition to retard their development—not economical considerations—have influenced Congress in imposing this absurd duty. This policy should be promptly met by a decided reply: "If you will not buy our pulp, you cannot get our pulp wood."

RAILWAY POOLING

In last issue of THE MANUFACTURER extracts were given from the report of the last National Convention of Railroad Commissioners, from which it appeared that they rather favored the legalization of pooling, but they recommended that, if legalized, it should not be permitted until its conditions should receive the approval of the Interstate Commerce Commission, and that it should be carried on subject to their regulations and control.

Bradstreet's, August 29th, has an interesting letter on this subject, headed, "The Objection to Pooling," after referring to the fact that the Commission was established ten years ago, the correspondent says: "The discussion of 'pooling' in its various forms was then fresh and interesting. The ground taken at that time was, that the public interest permitted, if indeed, it did not welcome agreements between carriers to abolish competitive charges, but it forbade agreements to abolish competitive service. The expression, 'combination in rates, competition in facilities' was then used as a single phrase to cover the requirements of public policy. Most of the development in the traffic department since 1885 has been in the direction of the maintenance of agreed rates by the observance of good faith rather than by the removal of temptations to violate agreements. The highest expression of this significant spirit is found in the Joint Traffic Association." The business of this Association is "to maintain, in the interest of carriers and people alike, uniform and stable rates," but this is done, as a rule, not by the physical device of pooling, but by the exercise of moral and legal suasion. Every member of the Association remains free to secure competitive traffic by means of gilt-edged passenger trains and "express freight" trains, but not by cutting rates. "Let transportation rates be established by agreement and maintained by honor, reinforced by the familiar 'associations,' and no considerable part of the people can long suffer injustice. Less injustice will be done under such circumstances than under a system of unrestrained competition in charges. . . . On the other hand, the preservation of competitive facilities for the transportation of men and merchandise promotes the general welfare and is in harmony with the spirit of the age. The effect of pooling is to restrict competition in that department of the transportation service in which alone fair and

open competition is possible. . . . Whether the pooling takes the form of a division of competitive traffic, or the cessation of soliciting on the part of strong lines, or the division of earnings, its result is to discourage invention, to elevate mediocrity, to take away conveniences previously enjoyed by the community, and, in general, to hinder progress."

Bradstreet's correspondent refers to a letter in the Railroad World, from Mr. W. M. Acworth, the well-known English authority on transportation, in which, after giving a list of new express passenger trains in England, he says: "the last few years have seen an enormous improvement in the convenience of the service between London and Scotland," and adds that English expert opinion disputes the view of those who think that "competition is the most burdensome and least efficacious method of securing to the public good and cheap railway service." Mr. Acworth quotes the high authority of Engineering to the effect that "competition may be an expensive luxury, but, at all events, it is a most effective stimulant, and we hope that it may be long before this factor will be eliminated from our English railway system."

The correspondent then refers to another method of competition, under which a leading western railroad began, several years ago, to distribute in New York circulars showing the time made by some of the freight trains west-bound. This prompt dispatch, showing that a pace had been set which in itself attracted traffic, induced competing companies to take the same course and they issued flyers of like purport. These circulars show more or less plainly regular schedules for the movement of freight trains from New York to the leading interior cities, and the Railroad Gazette draws the conclusion that "there seems to be no greater objection to advertising freight trains than passenger trains, if the advertised time is made."

Bradstreet's correspondent assumes that all the railroad difficulties as to cutting of rates and division of earnings can be adjusted by the observance of good faith on the part of the companies in keeping their agreements. The experience of the Interstate Commission is that all such agreements have hitherto proved abortive, as they have invariably been violated, whenever the interest of either contracting party seemed to promise profit through their violation. He also assumes that pooling, if permitted, will restrict competition and retard improvement of the service. Why should this be assumed? The establishment and maintenance of reasonable rates and a fair division of traffic would relieve railroad managers from much trouble and worry in struggling against secret rates, and from much loss in carrying at unprofitable rates; and this would enable them to devote their whole time and energy to such improvement of their service, as would attract additional traffic and would serve the public to better advantage.

CHANGE OF TRADE SENTIMENT IN ENGLAND.

The following are extracts from the British Trade Journal, London, Sept. 1st:

FOREIGN TRADE TACTICS.

To the Editor of The British Trade Journal.

SIR,—The startling statistics of the increase in exports from Germany, and the, comparatively speaking, stagnation in the figures of British exports, form a subject for deep reflection, and the question naturally arises, are Free Trade principles still the impregnable fortress upon which we should take our

stand? The supporters of these principles seem to be growing gradually less, and it appears to me that the time is approaching when a commercial war will be inevitable. The increase in our trade for the last fifty years has been phenomenal, but I am not prepared to admit that this increase is due to Free Trade principles alone. Twenty years ago our trade with those countries who since then have adopted the protective and bounty systems was larger than it is at present. We did nothing but laugh at those countries and their silly ideas then. Now these same countries are flooding our home and colonial markets with their manufactures, and competing with us to such an extent that capital can hardly get a remunerative return. Vide the cotton-spinning industry of Lancashire, where last year less than one per cent. on the average was earned, or, to bring it more close to home, there are not one-half of the looms going in Glasgow to-day that there were twenty years ago. We have ceased laughing at these countries and their protective ideas.

I am not going to trouble you with statistics which can be turned almost any way to suit a special argument, but I do claim that in self-defence and self-preservation we are bound to open war on those countries who are sapping our industry to the backbone, and that any means we can employ are justifiable to carry it on to a successful issue. We cannot be an agricultural nation, and nature has, therefore, made us a manufacturing one; but take away from us our manufactures and markets and we are nothing; therefore we are forced to adopt a merciless policy towards all and every one threatening our industrial existence. The Zollverein as proposed is a step in the right direction, but it does not go far enough.

We must use the buying power of our country as a lever to break down the whole protective and bounty systems, and although the remedy may seem to be severe, I would propose that Germany or any other protective country be formally notified that until the protective tariff be reduced to a purely financial one, no goods of any description will be allowed from there into this country at all. There is no use mincing matters on a question of this kind. Reciprocal or retaliatory duties are of no use. The British nation is capable of holding its own against any other, but it should not be asked to do so on an unfair basis as at present, and what is wanted is not a custom house to hamper trade, but really free trade, with liberty not only to buy where we like, but also to sell where we like and can, as a manufacturer pointedly remarked to me the other day.

With the adoption of the above remedy, which, I regret, seems to be the only one left, there is no protective country that would not have to give in very quickly indeed, and if one succumbs the others will follow suit. It is a duty to ourselves to open the attack at once, as the longer we defer doing so the stronger will our competitors become, and the worse it will be for us.

I am, etc.,

6 Hanover Street, Glasgow,
August, 1896.

WALTER S. SMITH.

THE SUGAR BOUNTIES.

Even the English textile districts are beginning to take a more reasonable view of the sugar bounties, as witness the following letter, dated August 3rd, and signed J. Midgley, Todmorden, which appears in a leading Manchester journal:—

"The concluding words of the article in to-day's Guardian, 'that the effect of the bounty system is precisely the same, so far as the bounty-giving countries are concerned, as if they were to make an annual money present at the expense of their taxpayers to every family in the United Kingdom,' may, I suppose be taken as a truism, and the words have been so often repeated that we have come to regard them as entirely and satisfactorily settling the question so far as we are concerned. There is one point, however, in connection with this bounty question which seems to me to deserve some consideration, but which, so far as my observation goes, seems to be overlooked. I refer to the effect of these bounties upon our sugar-producing colonies. There has been some little soreness felt, and some complaints have been made by some of our

people at the importation of foreign prison-made goods to compete with our own productions. Such complaints may or may not be reasonable. But suppose Germany or some other foreign country to grant a bounty on all its cotton fabrics exported to this country, a bounty sufficient to close half the mills in Lancashire, how would such legislation be regarded in this country? Would it be thought sufficient to say that Germany is thereby 'making an annual money present to every family in the United Kingdom?' Or would any supposed maxim of Free Trade, or any economic axiom of the Guardian, prevent an immediate and irresistible agitation in defence of our local industries? But if Lancashire would thus rise in defence of her industries and her homes, and would sweep away as mere cobwebs the fine maxims of economists, how is it that we are content to see our fellow-subjects reduced to penury and ruin by exactly the same legislation respecting sugar? We have of late heard something of 'sweating,' and much virtuous indignation has been expressed at the heartless wrongs thereby inflicted on the helpless and poor; but how is it that no voice is raised against the atrocious sweating to which we doom our sugar-growing colonists? Here is a gigantic system of sweating by which our fellow-countrymen are being ground to the dust in order that that we may have our sugar at less than cost price. What have our so-called Christian socialists to say to this? How long are they going to be silent respecting a system which is laying waste some of the fairest and most fertile regions of the earth? How can they escape the reproach of those who 'strain at a gnat and swallow a camel'? I much fear we all of us are too ready to wink at oppression by which we profit, and are more ready to enjoy cheap sugar and eat cheap bread than to consider whether the producer of what we enjoy can live on the fruits of his labor."

It is very significant that this old-time ultra free-trade journal should publish in one issue of its paper two communications such as the above, without a single remark in opposition to the views which they express.

The Trade journals of England are full of references to the severe competition to which their manufacturers are exposed from Germany; and frequent quotations are found from Mr. Williams' work entitled "Made in Germany," to which THE MANUFACTURER has recently had occasion to allude.

The British Trade Journal complains: that whereas German and French diplomatists and consuls are not above putting in a good word for their "nationals" when important contracts or concessions are going, the representatives of the United Kingdom seem to think it "infra dig" to associate themselves with commercial affairs.

Again, "Hitherto England practically monopolized the import coal trade (of Roumania) but Germany has just commenced to compete with the United Kingdom."

Quoting from a report of the British Acting-Consul at Angora, May 8th, relative to the trade with Turkey, it says that Belgium, "and to a somewhat less extent Germany, have become, as is well known, our most formidable competitors in all that pertains to the iron trade, not only here in the east, but also in Europe."

Brazil—British Vice-Consul at Maceio, advises: Continental firms are very active and pushing, and are gradually encroaching upon British trade.

Cape Colony—The British Consul, at Lorenzo Marques, May 1, 1896, says: In a small way at first, but steadily advancing on ever-broadening paths, German manufacturers and German vessels, I will not say supplant British industries and British lines, but certainly enter into a rivalry with them which every year becomes keener, and which every year sees tending to the advantage of the lesser competitor. The

following figures taken from the Gazette of Cape Colony illustrate this contention with some force. For the three years, 1893-5, the imports from England and Germany to Cape Colony were as follows:

	1893.	Value. 1891.	1895.
England . . .	£9,203,317	£8,877,032	£10,427,201
Germany . . .	244,576	448,412	772,940

Thus, while British imports show an otherwise satisfactory increase, German trade has more than trebled.

New Zealand—German Official Report from Auckland: The imports of German goods are increasing from year to year, the principle articles being: shoemakers' grinders, surgical and scientific instruments, pianos, sewing machines, toys, saddlery, glassware, metal wire, chemicals, woollen, silk and cotton manufactures, india-rubber goods, hops, spirits, wine, beer, liqueurs, cigars, chocolate, cocoa, printers' goods, paper, dyes, matches and tools.

Referring to Commercial Confederation, the Journal reports: Mr. John Lowles, M. P., who has just concluded a lengthened tour in the Australian colonies, on behalf of the United Empire Trade League, states that he is more than satisfied with the result of his mission, and that everywhere his plans have been received with enthusiasm.

"The tendency of the German Government and of German manufacturers and merchants is to become more and more independent of the British markets."

Many extracts of similar tenor might be given, but enough has been furnished to show the absurdity of the contention that a protective country cannot manufacture as cheaply as a free trade country, or that the policy of protection detracts from the ability to export. English manufacturers are learning very fast that the day of their undisputed supremacy and independence of Government assistance and consideration is past, and that the time has come when Government must exercise all its powers and sagacity in aid of British industries.

EDITORIAL NOTES.

The General Post Office, St. Martin's-le-Grand, London, contains the largest telegraph office in the world. Over 3,000 operators, 1,000 of whom are women, are employed.—The Electrical Review.

Horseless carriages are gaining in popularity in Europe. Considerable development in this field in the United States is expected in another year.—The Electrical News.

The production of coal in India last year slightly exceeded 3,000,000 tons, or an increase of 245,000 tons over 1894, and of 1,771,000 tons on the output of 1885. The fuel is, as a rule, of satisfactory quality; but some of the coal is unfitted for steam raising, while some is so fiery that it is very destructive to grate bars.—Industrial Record.

Within the corporate limits of the city of Durango, Mexico, is a mountain of solid iron ore. The mountain is one mile long, 388 yards wide, and 640 feet high, and represents a total of 1,246,984,244 cubic feet of ore. This would be enough, it is estimated to supply all the foundries of Great Britain with ore for 330 years, and the value of the metal so obtained would be nearly ten billions of dollars.—Industrial Record.

Edison, it appears, has discovered in the course of his experiments with the X rays, a new process by which aluminum becomes as strong as steel without detracting from its lightness. Aluminum was used for electrode which had been submitted during the experiments to a current of 2,500 volts. On attempting to use the electrodes the second time Edison found to his great astonishment that the aluminum had undergone a modification and had become as tough as steel.

The Industrial Record, Boston, Sept. 5th, in replying to Mr. Bryan's complaint that the charges for transportation have not decreased in same proportion as the prices of commodities, gives the following figures:—The average rate charged on sixteen of the north-western grain-carrying roads, Boston & Albany, New York Central and New York State canals, in 1872, was 240 cents per ton per mile. In 1891 the average rate had fallen to .801 of a cent per ton per mile, a decline of sixty-seven per cent. Lake and canal freights from Chicago to New York were in 1872 24.47 cents per bushel; in 1895 4.11 cents per bushel, a decline of eighty per cent.

The Electrical Review, New York, Sept. 9th, refers to a decision by a police justice in Jersey City, who, in a case before him, held that "a street railway transfer ticket is good until used." A passenger had been arrested for creating a disturbance by insisting that the conductor should accept a transfer ticket issued two hours previously. The rule of the company requires that such tickets must be used within ten minutes after the passenger receives it. Notwithstanding this rule, the police justice discharged the prisoner, and advised him to sue the company for damages. The Review does not believe that this is good law, nor that it would be sustained by the higher courts, and recommends that the case be carried to a final decision.

At Lamb's Conduit Street Repository sixty-five Canadian horses, comprising heavy draught horses, vanners, and high-class carriage horses recently shipped by the S.S. Iona, Rosarian and Montezuma, the majority being in first-class condition, have been offered. The property which attracted most attention was that of Mr. Wilkinson, of Owen Sound, Ont., which comprised fourteen horses, five and six years old, exhibiting any amount of courage, action, and plenty of bone. The lot realized 453 guineas, or an average of a trifle over thirty-two guineas each. A splendid bay mare (five years) went cheaply enough for forty-three guineas. At the London Horse and Carriage Repository Mr. E. C. Roberts offered thirty-five Canadian horses, which sold fairly well.—The Canadian Gazette.

The Financial News, New York, Sept. 8th, says: "Comparisons of prices since the gold movement was fairly under way, with those established since its practical cessation, do not indicate enough solidity in the trading to call this a bull market. Arrayed against temporary measures to prevent a disastrous slump, we are compelled to recognize the low prices of agricultural products; the depression in general business; the demoralization in railroad traffic rates; the closing down of leading steel and iron manufactories, the current distress amounting almost to pauperization among textile employees, and the emphatic notice given by the grain exchanges to the farming interests that, no matter how large or how small a crop may be, the profits of the grower shrink continually."

At a meeting of the Dominion Millers' Association, held at Toronto, last week, the following resolution was introduced by Mr. James Cummings, of Lynn, seconded by Mr. H. Burritt, Port Hope, and carried unanimously:—

That whereas the general election in June has resulted in a change of Government: now therefore this association, composed of over 200 members, re-affirm and place on record their strong desire that no change be made in the tariff in regard to the duties on wheat and flour by the new Government; further, that members of this association would view with alarm and disfavor reciprocity with the United States in wheat and flour, and believe it would result in great loss and injury to the farmers and millers of this country. We therefore delegate to the Executive Committee full authority to take such action and make such representation as they deem best to give effect to this association's desires in this matter.

The annual report of W. Archibald Reid, Port Warden of Montreal for 1895, shows that there was a decrease of thirteen sea-going vessels entered at his office, but an increase of 15,620 tons as compared with 1894. The season had proved unusually disastrous to shipping, the total losses being much greater than usual. There was a large decrease in the exports of grain, the decrease being 1,692,588 bushels as compared with 1894, and 13,696,005 bushels less than in 1893. The Warden says that the shipping trade suffered much loss and inconvenience from the unprecedentedly low water in the harbor and ship channel below Montreal, owing to which some of the largest steamers had to complete cargoes at Quebec. He also urges the necessity for a port of refuge on the south shore of the River St. Lawrence, and recommends Metis as the most suitable, and suggests that the necessary surveys should be made to decide as to feasibility and value of the scheme.

Canadian eggs, like Dominion bacon, are, says the Daily Telegraph, gradually winning their way into the English markets. They come either fresh or pickled. The exports of fresh eggs have begun rather earlier than usual this year. The demand seldom sets in before autumn, when the flush of the foreign supply into Great Britain is over, and prices commence to strengthen and afford a more profitable market for Canadian fresh-laid August eggs, which are considered the best of the year. This year, however, 2,250 cases have already been shipped from Montreal, against only seventy-eight cases for the corresponding period last year. Liverpool is the chief market for Canadian eggs; for of the above shipments 1,682 cases went to that port, 485 cases to Glasgow, and ten cases to Bristol. Some heavy contracts have been made with English firms for November-December delivery of pickled eggs, at prices ranging from 6s. 3d. to 6s. 9d. per long hundred of ten dozen.—The Canadian Gazette.

Mr. James Long, a recognized authority on agricultural subjects in England, is writing a series of letters to the Mark Lane Express on the food supply for Great Britain. In answer to a question, "Can the food required by the people be produced within the British Empire?" he says that it would be impossible for the Colonies to do so at even two or three years' notice. According to present statistics, the surplus production of wheat in Canada, Australia and India is about 55,000,000 bushels. He says that the area in the Canadian North-West adapted to the cultivation of wheat is prodigious,

the territories there being three-quarters of the size of all Europe, of which 203,000,000 acres are adapted for wheat, 260,000,000 acres for barley, 419,000,000 acres for potatoes, etc. Mr. Long has seen something of the soil there, and has obtained reliable information from officials who are well informed, and have great faith in the future ability of the North-West to supply all the food required in England. He says: "If food could be produced were sufficient notice given, I can conceive no reason why, effect having been given to a national resolution, preference should not be given to the Colonies, immediately they are prepared to supply all our wants"

AN EGYPTIAN CANAL IN PROSPECT.—The New York Herald is authority for the statement that the Egyptian Government will shortly proceed to excavate the Raiyan Canal on plans proposed by Mr. Cope Whitehouse, of New York city. The Raiyan Canal is to be ten miles long, and will connect the Nile river with a tract of 250 square miles of land a few miles southeast of Cairo, and 120 feet below the level of the Nile. By draining the surplus flood waters of the Nile into this tract it is estimated that crops worth \$70,000,000 can be raised on what is now a desert, and that better control will be given of the Nile floods with favorable effects on the sanitary conditions of the Lower Nile. Mr. Whitehouse discovered this tract while traveling in Egypt, and having bought the tract has had plans for its development before the Egyptian authorities since 1891. It is estimated that the canal will cost \$3,000,000.

The Winnipeg Commercial, Sept. 7th, reports an interview with Mr. Nairn of the Board of Trade there, who had just returned from Britain. Among other items of information is the following:—

As to municipal management of the city of Glasgow, which has attracted so much attention of late, Mr. Nairn speaks of certain particulars which came under his notice, and which have not been noted before. One of these was the system of municipal farms. In one case to which his attention was directed while going to the Old Monkland Kirk, thirteen miles from Glasgow, the city had purchased three or four farms amounting to about 650 acres. The land on the property was very poor when the city took hold of it, but having fertilized it with street scrapings and garbage, it has now become much more productive. A switch from the Monkland Railway is utilized for unloading garbage, and also for loading paving blocks of whinstone, which are quarried on the farm. The farm is also utilized for getting street car horses into shape for work again, and also to provide work for horses no longer useful on tramways. The whole is under the management of a practical farm manager, who has made it a paying concern like everything else controlled by the city of Glasgow. When will our city corporations on this continent have such a story to tell?

The Manufacturer, Philadelphia, Sept. 5th, says: "This country can make anything that can be made by human skill and effort. Only a few years have elapsed since an American Secretary of the Navy, wedded, as many Americans are, to the notion that Europeans can surpass us all along the industrial line, paid a large sum for plans of British battle-ships, which, when applied in construction by our builders, proved to be almost worthless. Since that time one shipyard in Philadelphia has constructed, upon original plans, many war-vessels which are probably superior in some particulars to the finest produced in other countries. The very

latest, the Brooklyn, is said to be also the best, showing progressive improvement upon the part of the builders, as the result of opportunity and practice. These are all that are required for American manufacturers, whether of ships or shoes, or any other product of industry. We can supply our own wants by employing our own people if the government will permit us to make the effort without the hazards of destructive competition from other countries."

The Winnipeg Commercial has a report of the proceedings at the first annual meeting of the Manitoba and North-West Millers' Association, held at Brandon Sept. 1st. Among other question considered were:—

The question of grinding in bond was discussed at length. It was strongly pointed out that the present arrangement is unfair to the western wheat grower and also to the western millers. Instead of buying Manitoba hard wheat, eastern millers are allowed to import hard or other wheat from the United States and grind the same, getting a rebate of the duty when they export a like quantity of flour. The effect of this is to rob the western farmer and miller largely of the benefit which they should derive from the duty on wheat and flour. The eastern miller can import hard wheat from the States and sell the product at home, getting a rebate on flour exported which is made from eastern wheat, thus supplying the eastern markets with hard wheat flour made from imported wheat, which otherwise would have to come from Manitoba and the territories. In the same connection reference was made to the duty on corn. It was claimed that corn was being imported from the States and ground and sold for feed by the eastern millers. The effect of this is to depress the market for millstuffs, which cannot now be shipped to eastern markets, as the freight, commission, cost of bags, etc., is equal to the market value of the millstuffs, leaving nothing for the miller. Under the tariff act, only corn ground for human food is subject to a rebate of the duty, but it is claimed that much of this corn is being sold for ordinary feed. The matter of the wheat and corn rebates were left with the executive, for future action at the proper time and place.

In the last two issues of *THE MANUFACTURER* considerable space was given to a review of some of the proceedings of the recent convention of United States Railroad Commissioners. As the expediency of appointing a Railway Commission for Canada is now being discussed, it may be interesting to note some of the other points discussed at above convention. All the commissioners were agreed that government has the power to acquire the railroads of the country by purchase at a fair valuation, but there was considerable difficulty found in determining the basis of a fair valuation, and there was a difference of opinion as to the expediency of exercising that power. Hence, there was a majority report against, and a minority report in favor of government acquiring all or at least several of the more important lines at their present value, either by purchase or condemnation. The over capitalization of railroads, all admitted, has proved a most mischievous factor in inducing the companies to charge exorbitant rates for their services. As prices and values have greatly declined on the products of the soil, the mine, the forest and the factory, as real estate, bank and other stock have depreciated, railroad securities have suffered with the rest; hence, railroad rates must be based upon present value of the roads. Government should not have permitted many of the roads to be constructed which have been built. It should have expressly retained the power to fix the rates according to the

varying conditions of the traffic and with due regard to the rights of those who invested their money in the railroads.

The new Canadian government is beginning to consider the chances that the McKinley administration will consent to the negotiation of another reciprocity treaty with the Dominion. Mr. Laurier, who has just come into power there, is reported as saying:— "I am prepared to make an arrangement with your country" (the United States) for the free exchange of such national products, and such manufactured articles as may be mutually agreed upon. The reciprocity system can never be advantageous to us unless it shall deal solely, so far as imports are concerned with articles which we cannot produce by our own industry. Canada has few products which are different from those of this country, and the matter of reciprocity with her is likely to shape itself into the question whether it is worth while for us to barter admission to a market of seventy million people in return for admission of our wares to a market of five million people. There is also this consideration: Canada will not be permitted to give to American goods tariff favors denied to British goods. If, for example, we should consent to admit free of duty Canadian iron, and Canada should also give free entry to British iron, the end would be the importation of British iron to this country by way of the Dominion. We have tried reciprocity with Canada in the years gone by, and we retreated from it because experience showed us to be losers. Is it worth while to try a similar experiment now? Reciprocity which will benefit us, while bringing gain to the other parties to the transaction, is that which is arranged with such countries as Brazil, from which we buy things which we cannot get from our own resources.—
Manufacturer.

The Daily Picayune, New Orleans, published on Sept 1st a special number of forty pages, containing much interesting information. Among others it refers to the "Bee L-Abeille," as its venerable contemporary, which has completed its sixty-ninth year of publication, and is the oldest newspaper in Louisiana, is published in the French language, and has enjoyed a large measure of prosperity and popularity. The Picayune refers to the St. Louis and Mississippi Valley Transportation Company which has a fleet of 100 barges trading to New Orleans, one of which has a capacity of 55,000 bushels. This company delivered at that port during the first six months of 1896, 6,542,800 bushels corn; 1,067,900 bushels wheat; 163,400 bushels oats, all in bulk; and 358,523 packages of flour, grain, hay, etc. It gives a report of the business of Mobile during the past year, the trade of which with Central America, increased ten per cent., but its trade with Cuba in lumber had been interfered with by the war there. In referring to the trade of New Orleans, it says that the shipping has developed greatly, principally owing to the larger tonnage of vessels employed; the building trade is improving because of the tendency to build finer homes; the trade in live stock is decreasing because of the more general use of refrigeration for dressed meats; the exports of domestic produce in 1895-96 amounted to \$33,622,096, as compared with \$68,425,316 in 1894-95; the levee system through the state has been greatly improved, and the banks have been made high and strong; 175 miles of new levees have been built, and 371 miles of old levees have been raised and enlarged; the port facilities have been enlarged and two

new elevators erected during the year. Very full reports are given of the movement and prices during the year, of cotton, sugar, rice, grain, and their products. Also, an interesting account of the arduous battle fought in securing the bounty on sugar which had been voted in Congress, but payment refused by Mr. Bowler, controller of the treasury, on the ground that the grant of the bounty was unconstitutional, which contention was set aside by the court before which the point was argued.

The American Miller, Sept. 1st, has an interesting article on "Discrimination in Freight Rates." It says that recent decisions of the Supreme Court of the United States, regarding the Interstate Commerce Act, place all shippers on equal footing as to interstate transportation. Discrimination applies to unlawful fares and unlawful freight charges. It may be practised in the facilities allowed to different shippers, such, for example, as the order in which the goods are shipped, the opportunities afforded for shipment, the furnishing of necessary cars, etc. Discrimination in freight tariffs means to charge shippers unequal sums for carrying the same quantity of goods equal distances. The fact that the higher rate is not unreasonable does not affect the fact of discrimination. To charge one, by means of a rebate, a rate less than the fixed tariff rate is not a discrimination. Such a contract does not prevent anyone else from obtaining as low or even lower rates; but to charge one a higher rate than the lowest given to anyone else, is discrimination, when it prejudices the one so charged. An agreement not to allow to others a drawback from established rates of transportation which is allowed to one, is against public policy and void. The law against discrimination cannot be avoided by an agreement to pay full rates in the first instance, and to be repaid by rebates. It says:—

The reasonableness of freight charges is a question of fact, and not of law. Under the Interstate Commerce Act, the charges made for the transportation of passengers or property, or the receiving, delivering, loading or unloading of property, must be reasonable, and no discrimination can be made in rates charged or facilities accorded. At common law the rule is that carriers shall not exercise any unjust discrimination in rates or toll. They are held to do exact and even-handed justice to everybody doing business with them. Discrimination must consist in allowing one party what is denied another. The common carriers cannot make unreasonable discrimination, or give undue preferences between persons applying to them for carriage, either of persons or goods; either in granting carriage to some and not to others; or in carrying for some for less rates than for others. Transportation by them is open to the public upon equal and reasonable terms. The statute as to interstate carriage is simply an enactment of the common law as to all carriers. A contract relative to freight charges that is not according to the established rates leaves the shipper at the mercy of the company, as it cannot be enforced against it. It is true that the commission has no power to make rates generally, but only to determine whether rates imposed by the railroad companies are in conflict with the statute, that is whether by comparison they are reasonable. The railroad companies may classify freights and passengers and charge different rates for different classes, if there are reasonable grounds for such distinctions, in the different cost of service, risk or care, or in the accommodations furnished, or the like; but the rates must be the same for all persons and goods of the same class. Charges for freight and passengers must be uniform. Transportation must be open to the entire public upon equal and reasonable terms.

CALCUTTA'S DOCKS.

Among the most notable systems of dock construction achieved by modern engineering science, Calcutta may be said to present a conspicuous example. The entrance to these docks is through a channel eighty feet wide, and a lock sixty feet wide, terminating in a basin measuring 600 by 680 feet. Two entrances, sixty and eighty feet wide, lead from this basin into the dock proper, which is 2,600 feet long, sixty feet wide for the greater part of its length, and covers thirty-four and a half acres, two dry docks also leading off from the basin, one of them 520 feet long and the other 350 feet. While the river is low these waterways are supplied with fresh water from the neighborhood, and elaborate provision is made to remove the mud from this water before it is pumped into the basin. The docks are equipped with fifty-six movable hydraulic cranes, of which fifty are constructed to move as much as one and three-fourths tons, while the remainder can handle weights of five tons, all of them overhanging the quay twenty-nine feet, and operated by water under pressure, as are also the lock gates, capstans, and swing bridges about the docks. The water is under a pressure of 700 pounds and is furnished by two pairs of hydraulic engines, each of 230 horse power.

LUMBER FOR SOUTH AFRICA.

It seems to us that our lumber producers do not appear to realize the extent of the foreign market that there is for them to take advantage of. We have repeatedly pointed out the great opportunity that Central America presents in a variety of lines of trade, and to a limited degree we have striven to introduce our lumber into Australia and South Africa. It is worthy of note that in Cape Colony the total imports of unmanufactured and planed and grooved wood during the year 1895 amounted to \$1,475,369.64, of which pine is represented by the sum of \$721,258.02, staves by \$48,322.98, and hardwoods grown in Canada by the sum of \$28,625.40. The consumption of hardwoods in that colony for this and succeeding years will largely increase, as the furniture and other industries requiring them are fast developing. The total exports of lumber of all kinds from Canada to British South Africa during the fiscal year 1894-5 amounted to the sum of \$29,263, so that there appears to be room for extension of trade in this direction.

Good stock is essential. It is to be observed that at the last meeting of the council of the Board of Trade a communication was read from Mr. Ernest Braly, a merchant of Sydney, N.S.W., asking if it were possible to get lumber such as is sent to Australia from Puget Sound. There can be no doubt in regard to this, the only difference being that the British Columbia lumber is in some respects better than that from Puget Sound.—British Columbia Commercial Journal.

The Industrial Record, Boston, August 22nd, in an article headed, "Average Annual Incomes," says that the per capita annual earnings and incomes of every man, woman and child in the United Kingdom is \$172; in the United States \$135; in France \$107; in Prussia \$80.00. In the United States the income is mostly made up of earnings; in Great Britain it is largely derived from accumulated capital. It is this latter fact which explains the plethora of capital which keeps the rate of interest on money lower in London than in any other financial centre.

The largest gold coin now in circulation is the "loof" of Annam, a French colony in Eastern Asia. It is a flat, round gold piece, about as large as a tea saucer, and is worth \$220 in United States coin. The second largest is the "obang," of Japan. This is a beautiful oblong coin of the finest quality of gold, and is worth about \$55 of our money. The third largest and most valuable of the regular current coin of the nations is the "benda," a ham-shaped ingot which circulates as lawful money in Ashantee. This is worth about \$49 in United States gold.

The Chicago Daily Bulletin reports that some Chicago commission merchants are borrowing money from French bankers, for which they pay interest at 7 per cent. on notes payable in gold. It also states that with the object of keeping down the rate of sterling exchange, one leading American firm has been borrowing \$5,000,000 in London. The Bulletin gives the following estimates of the wheat crops in Europe: United Kingdom, 56,000,000 bus; France, 340,000,000 bus.; Germany, between 98,000,000 and 112,000,000 bus.; Spain and Portugal, 50,000,000 bus.; Austria, Hungary and Roumania, average crops; Russia about an average, except in the south.

Talking about the bounty of thirty millions a year we have been paying to encourage foreign, and especially Asiatic competition with American industries it is bearing fruit. We have already seen three Japanese steamer lines established to bring us Japanese goods in competition with our home manufactures. A despatch from San Francisco now announces that China is coming in as a competitor with another line of our industries. The despatch announces the arrival at San Francisco of a cargo of anthracite coal from Tonquin, China, and says: "An important trade promises to spring up in this article. Tonquin anthracite is as good as the Pennsylvania product and much cheaper here."

The report of the Board of Trade, Vancouver, for 1895-96, says: Vancouver is the principal seat of the timber trade of British Columbia. The export trade is confined to Douglas fir, cedar and spruce, the first named being the principal article. Masts of this fir, 120 feet long and 26 inches in diameter, and timber 70 feet long and 36 inches square have been shipped. Exclusive of steamer shipments to Japan and Australia, the timber trade gives employment during 1895 to 49 vessels of an aggregate capacity of 48,560 tons. The exports from Vancouver by sea amounted to 45,427,772 feet board measure; and by rail 6,983,882; in all 52,411,654 feet.

The Iron and Steel Trades Journal says that the iron trade of Germany during the first half of 1896 has been in a very prosperous condition. The output compared with last year as follows:—

	1896	1895
Forge pig, tons	848,762	782,822
Bessemer pig "	246,370	232,505
Thomas pig "	1,567,121	1,384,921
Foundry pig "	435,342	435,116
Total	3,095,805	2,835,364

There has been an advance in prices since January 1st, 1886, in the Rhenish-Westphalian district except in No. 1 foundry pig. The advance in Thomas pig, \$1.50 per ton; on Bessemer pig, \$1.50; on Spiegeleisen, \$1.50 per ton.

It is pointed out that the marked increase in railway operations last year was in freight tonnage, which for all roads increased 11.72 per cent. Passengers carried decreased 6.73 per cent. The gain in freight tonnage afforded an increase in freight earnings of over \$43,000,000, while the loss in passengers carried caused a loss in passenger earnings of \$14,000,000. The magnitude of the railway interest of the country is shown by the fact that gross earnings were over \$1,000,000,000 and net earnings were over \$323,000,000. The average management was good inasmuch as an increase in gross of 2.39 per cent. gave an increase in net of 1.7 per cent. The total stock and bond debt of all roads exceeded \$11,000,000,000, the amount increasing during the year over \$225,000,000. These figures put in most impressively the magnitude of railway interests in the country. The small margin of profit of the roads is indicated by the fact that trunk lines, furnishing probably the best part of the railway mileage, and including nearly one-half the total mileage, earned in excess of interest charges last year only 1.95 per cent. on the stock.—Financial News.

A straw which points to the future development of a remarkable source of economy in freight traffic is the utilization of the weight of the freight, which is proposed on a new road in Northern Michigan. This road runs from Lake Superior, fifteen miles inland to the mines, and in this distance the total grade amounts to a rise of 800 feet. The freight will be almost entirely iron ore, which is brought down in special cars, which are returned empty to the mines. The cars will be run in trains of ten each, each train being supplied with an electric generator, connected with the axles. The grade is such that the loaded cars run by their own weight, and the dynamos geared to the axles generate a current, which is taken off on a trolley wire and utilized to haul another train of empty cars back. It is thought that the difference in weight of the loaded and empty cars will give power enough to overcome all leakage, friction, line losses, etc. The engineers are figuring on using the dynamos as motors on the return trip, thus saving a duplication of machinery. The result of the experiment will be awaited with interest.—Philadelphia Record.

The Irish Land Purchase Act of 1891 has resulted in the commission receiving about 11,000 appliances for loans, amounting to some \$17,000,000. Of these, 6,761 loans have been granted for \$11,180,000. Prior to this, some \$40,000,000 of government money had been loaned to Irish farmers for land purchased or for redemption of rent. Here is a total of over \$50,000,000 advanced by government to farmers of Ireland. Under the new Land Act, just passed by parliament, about \$10,000,000 annually will be available for such advances, or five times as much as under the Act of 1891. These loans run at low rates of interest, and are

payable in small annual installments, running from forty-nine to sixty-nine years. So far the plan has worked admirably, very few peasants being in default, and none of them trying to cheat the government. In fact, about \$3,000,000 of principal has already been repaid by purchasing tenants, and three times as much interest has been promptly met. The success of this plan in Ireland directs special attention to the possibilities as well as the advisability of some system of direct state aid to farmers in the United States and other countries. It will be observed, however, that government is amply secured for its loans, which involve no currency inflation or experiments. Thus there is no reason to expect the disastrous results that followed the Argentine's loan of its credit to real estate boomers—the gigantic speculation that brought on the Baring failing in 1890, and gradually spread disaster over the world.—American Agriculturalist.

Messrs. Gooderham and Blackstock, Toronto, paid \$465,000 for their gold mine in British Columbia. It is evident that they believe there is a great future for the Rossland region.

The Berwick Foundry Company's premises, Berwick, N.S., were destroyed by fire on the 14th instant.

Granby, Que., is agitating for electric light. It is proposed that Adamsville, East Farnham and Farnham Centre join the enterprise.

A joint stock company will be formed in Deseronto, Ont., to build a flour mill in place of the one recently burned, as the Rathbun Company does not intend to re-build.

Citizens of Kingston, Ont., are trying to raise capital to build an elevator of a million bushels capacity.

J. H. Nairn, parchment manufacturer; McKee & Smith, spice mills; and the Dodd's Medicine Co., all of Toronto, were burned out Sept. 15th. Loss \$25,000.

CANADA'S GREAT FAIR.

The Exhibition in Toronto which closed last week was a great success. The arrangements made by the managers and the special attractions provided by them met with general and cordial approval. Everything contributed towards the success; the number of exhibitors, and the number and quality of the exhibits; the attendance of some distinguished visitors; splendid weather and immense crowds of people all combined to render this great Fair satisfactory to the city and its visitors, and financially gratifying to the directors and managers, to whom THE MANUFACTURER begs to tender its warm congratulations.

It is hoped that both the Dominion and Ontario governments will grant reasonable and liberal assistance towards increasing the extent and influence of next year's Fair. Indeed, very satisfactory assurances have been given to this effect. We feel assured that liberal grants may be safely entrusted to the present management, as in their hands the money will be economically and judiciously expended.

The following are the names of the exhibitors in the different buildings:—

MACHINERY HALL.

- Toronto Junction Foundry Company.—Malleable Castings.
- London Electric Motor Company.—Motors and Generators.
- John Bertram & Sons, Dundas.—Iron Working Tools.
- Macgregor, Gourlay & Co., (Ltd.), Galt.—Wood-working Machinery.
- W. A. Johnston, Electric Co., Toronto.—Motors.
- McEachren Heating and Ventilating Co., Galt.—Ventilating Fans, etc.
- The Weeks-Eldred Co., Toronto.—Mechanical Stoker.
- G. T. Pendrith, Toronto.—Pipe Machines, Dough Mixers, etc.
- A. R. Williams Machinery Co., (Ltd.), Toronto.—Iron and Wood-working Tools.
- Mica Boiler Covering Co., Toronto.—Boiler and Pipe Covering.
- Beardmore Belting Co., Toronto.—Leather Belts.
- E. Wheler, Toronto Junction.—Water Filters.
- Northey Manufacturing Co., (Ltd.), Toronto.—Pumps and Engine.
- Kay Electric Motor Co., Hamilton.—Electric Motor, etc.

C. Field, Toronto.—Ventilating Fans.
 Reid Bros. Manufacturing Co., Toronto.—Bent Wood Pulleys.
 William C. Wilson & Co., Toronto.—Oil, and Engineers' Supplies.
 Royal Electric Co., Montreal and Toronto.—Two fifty light 2,000 c.p. are Dynamos, two S.K.C. Motors, and two Direct Current Generators.
 E. Leonard & Sons, London.—Two Engines.
 Dodge Wood Split Pulley Co., Toronto.—Wood Pulleys, Hangers, Friction Clutch Pulleys.
 Toronto Electric Motor Co., Toronto.—Motors and Generators.
 Cowan & Co., Galt.—Wood-working Machinery.
 J. Perkins & Co., Toronto.—Gate and Check Valves.
 Cant Bros. & Co., Galt.—Wood-working Machinery.
 W. G. Harris, Toronto.—Babbitt Metals, etc.
 Ronald Fire Engine Works, Brussels.—Fire Engine and Chemical.
 The Goldie & McCulloch Co., (Ltd.), Galt.—Wood-working and Flour Mill Machinery, Ideal High-speed Engine.

STOVE BUILDING.

Wheeler & Bain, Toronto.—Furnaces, etc.
 Bucks Stove Works, Brantford.—Stoves and Furnaces.
 Metallic Monument Co., Toronto.—Monuments, etc.
 William Douglas, 120 Yonge St., Toronto.—Baths.
 McClary Mfg. Co., London.—Stoves and Furnaces.
 Rice Lewis & Sons, Toronto.—Gas Stoves.
 Doherty Mfg. Co., Sarnia.—Stoves, etc.
 A. J. Fowler, Toronto.—Crescent Gas Machine.
 Toronto Portable Oven Co., Toronto.—Stoves and Portable Ovens.
 Moffatt Stove Co., Weston.—Stoves, etc.
 Johnson Clench, St. Catharines.—Ash Sifter.
 Beaver Cycle Co., Toronto.—Ash Sifter.

T. Shipway, Toronto.—Ash and Garbage Receiver.
 J. A. & A. M. Kennedy, Blenheim.—Lyons Heat Radiator.
 Ontario Spring-bed & Mattress Co., London.—Washing Machines.
 North American Graphite Co., Ottawa.—Plumbago, etc.
 J. N. Story, Woodbridge.—Washing Machines.
 Keith & Fitzimmons and J. H. Burns, Toronto.—Acetylene Gas.
 Coruice Brake Co, Shelburne.—Double Truss Cornice Brake.
 Shultz Bros., Brantford.—Washing Machines.
 J. F. Pease Furnace Co., Toronto.—Furnaces, etc.
 McEachren Heating & Ventilating Co., Galt.—Little Wonder Boiler.
 Warden King & Son, Montreal.—Heaters.
 Geo. B. Barclay, 59 Dundas St., Toronto.—Adjustable Stove Pipe.

BICYCLE BUILDING.

R. A. McCready Co., (Ltd.), Toronto.—Bicycles and Sporting Goods.
 Automatic Bicycle Saddle Co., Toronto.—The Dyer Saddle.
 Rice Lewis & Son, Toronto.—Bicycle Parts and Sporting Goods.
 A. C. Anderson Cycle Co., Toronto.—Bicycles.
 Harris & Fudger, Toronto.—Victor Bicycles.
 Noah L. Piper & Sons, Toronto.—Bicycle Lock Stall.
 Dom. Bicycle Stand Co., Toronto.—Bicycle Stands.
 McKinnon, Dash & Hardware Co., St. Catharines.—Bicycle Chains, Whip Sockets, etc.
 Diamond Machine & Tool Co., Toronto.—Diamond Bicycles.
 Harold A. Wilson & Co., Toronto.—Saddle and Puncture Proof Fluid.
 McBride & Mercer, Toronto Junction.—The Hudson Wheel
 The New Barnes Cycle Co., Woodstock.—Bicycles.
 G. T. Pendrith, Toronto.—Sun Wheels.

ROBIN, SADLER & HAWORTH

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Orders addressed to our Toronto or Montreal Factory will have prompt care.
 Goods will be forwarded same day as order is received.

F. A. Clary, Toronto.—The White Bicycles.
Campbell & Black, Toronto.—Relay Bicycles.
Bowmanville Cycle Wood Rim Co., Bowmanville.—Wood Rims.
Wyles & Andrews, Toronto.—Japanning.
The Tireine Mfg Co., Hamilton.—Tireine.

CARRIAGE BUILDING.

Hutchinson & Son, Toronto.
S. Brown, Toronto.
Brantford Carriage Co., Brantford.
John Campbell, London.
J. Dixon, Toronto.
Canada Carriage Co., Brookville.
Newlands & Co., Galt.—Saskatchewan Buffalo Robes.
Tudhope Carriage Co., Orillia.
George A. Rudd & Co., Toronto.—Carriage Tops, etc.
Wm. Gray & Sons, Chatham.
Guelph Carriage Top Co., Guelph.
A. Murchhead, Toronto.—Varnishes and Paints.
Walter Dean, Toronto.
T. D. Dowsley, Owen Sound.—Springs, etc.
Winger Woolen & Felt Co., Elmira.—Horse Clothing.
J. B. Armstrong Mfg Co., Guelph.—Carriages, Sleighs, etc.
The McLaughlin Carriage Co., Oshawa.
C. Kloefer, Toronto.—Saddlery and Carriage Hardware.
H. L. Bastien, Hamilton.—Row Boats.
M. Guy, Toronto.
B. J. Nash & Co., London.
St. Charles & Pringle, Belleville.—Omnibuses.
C. Collett, Toronto.—Wagons.
Jas. Ewart, Toronto.—Wagons.
Chatham Mfg Co., Chatham.—Farm Wagons.
Woodstock Wagon & Mfg Co., Woodstock.

Snowball Wagon Co., St. Georges.
Adams & Son, Paris Station.
Speight Wagon Co., Markham.
Jas. Cruickshanks & Sons, Weston.—Road Carts.
Bain Wagon Co., Brantford.
Ontario Peat Fuel Co., Toronto.

MAIN BUILDING.

Standard Silver Co., Toronto.
C. P. Fabien, Montreal.—Refrigerator.
Rochester Lamp Co., Toronto.
The Reid Mfg Co., Toronto.—Billiard Tables.
The James Robertson Co., (Ltd.), Toronto.—Paints and Plumbers' Supplies.
John Taylor & Co., Toronto.—Soaps and Perfumeries.
Canada Paint Co., Montreal.
Toronto Fence and Ornamental Wire Works, Toronto.
St. Croix Soap Mfg Co., St. Stephen, N.B.—Soap.
Nicholson & Brock, Toronto.—Bird Seed and Food.
Auteurs & Cox, Toronto.—Artificial Limbs.
Francis Frost & Co., Toronto.—Paints.
J. C. McLaren Belting Co., Montreal.—Leather Belting.
McMillan & Haynes, St. Catharines.—Saws, Axes, Iron Beds.
Seaman, Kent & Co., Toronto.—Sliding Blinds.
Christie Brown & Co., Toronto.
W. E. Sardford Mfg Co., Hamilton.—Clothing.
C. Wilson & Son, Toronto.—Scales, Butchers' Tools, etc.
The Clark Dental Mfg Co., Toronto.—Dental Chairs.
George B. Meadows, Toronto.—Wire-cloth Screens, etc.
The Cowan Co., Toronto.—Chocolate.
J. H. Rogers, Toronto.—Furs, etc.
The Brown Bros. Co., Toronto.—Blank Books.
Canada Rubber Co., Toronto and Montreal.

The Royal Electric Co'y

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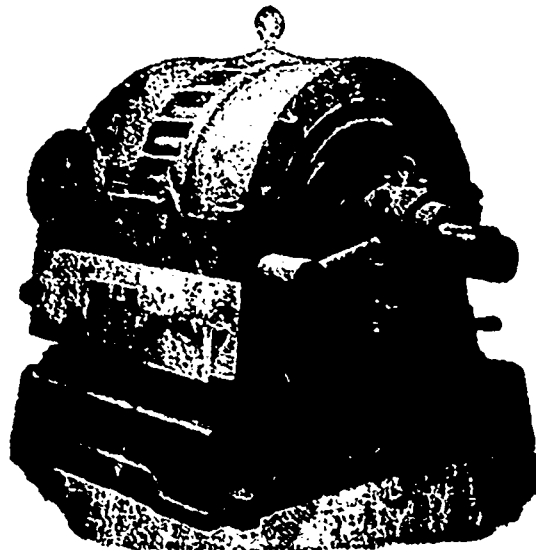
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 A. W. Spooner, Port Hope. — Babbitt
 Metals and Disinfectant.
 Paterson Mfg Co., Windsor, N.S. — Water
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 Toronto Fruit Vinegar Co., Toronto.
 Eureka Refrigerator Co., Toronto.
 Macdonald Mfg Co., Toronto. — Japanned
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 Brantford Stone-ware Mfg Co., Brant-
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 The Wehrle Brush Mfg Co., Toronto.
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 Burford Canning Co., Burford. — Canned
 Goods.
 Pelee Island Wine Co., Brantford. —
 Wines.
 Windsor Salt Co., Windsor.
 Don Valley Pressed Brick Works., To-
 ronto. — Bricks and Terra Cotta.
 Ireland National Food Co., Toronto.

Globe Paint Co., Toronto.
 Toronto Whip Co., Toronto.
 Burlington Mfg Co., Burlington, Ont. —
 Wringers.
 John Palmer, Fredericton, N.B. — Up-
 holstering Leathers.
 Colin McArthur & Co., Montreal. — Wall
 Papers.
 Toronto Rug Works, Toronto.
 Woodstock Rattan Co., Woodstock. —
 Baby Carriages.
 Paul Frind Woolen Machinery Co., To-
 ronto. — Card Clothing and Machinery Sup-
 plies.

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 Morris Field & Rogers, Listowel.
 Octavius Newcomb & Co., Toronto.
 Menzies-John Piano Co., Toronto.
 Gerard Heintzman Piano Co., Toronto.
 R. S. Williams & Sons, Toronto.
 De Lenty Organ Co., Clinton.
 Scribner Organ Mfg Co., London.
 Bell Organ & Piano Co., Guelph.
 Mason & Risch Piano Co., Toronto.

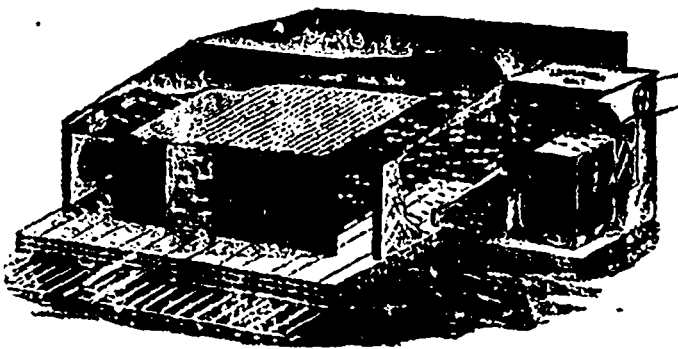
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 arines.
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 Massey Harris & Co., Toronto.
 Verity Plow Co., Brantford.
 Watson Mfg Co., Ayr.
 The Cossitt Bros. Co., Brockville.
 David Maxwell & Son, St. Marys.
 Peter Hamilton Mfg Co., Peterbor.
 J. E. Fleury & Son, Aurora.
 J. W. Cameron, Ingersoll.
 Thorn's Implement Works, Watford.
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 Wortman & Ward Mfg Co., London.
 Pratt & Letchworth, Buffalo, N.Y.
 Emerson & Campbell, Tweed.
 American Harrow Co., Detroit, Mich.
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 Deering Harvester Co., Chicago, Ill
 Martin Roche & Co., St. Thomas.
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McEachren's System of
Drying, Heating and Ventilating

Under Recent Patents.



In construction and process of drying this Kiln differs widely from all others in use. They have given entire satisfaction where all others Dry Kilns have failed. They will season More Lumber in a Given Time, with a given heating surface and a given quantity of steam than any other Kiln now in the market. Their construction and mode of operating is such as to season lumber without Case Hardening, Checking or Warping. They work equally well on Lumber right from the Saw and on Air Seasoned Lumber, the only difference being that one takes a little more time than the other. By a Peculiar Arrangement Found Only In Our Dry Kilns we extract the moisture from the heated air, return it through the heater again and thus preserve the heat passing from the Kiln instead of wasting it as is the rule with all other Blast Kilns.

Ventilating Fans, Shaving Fans, Pressure Fans, all sizes.

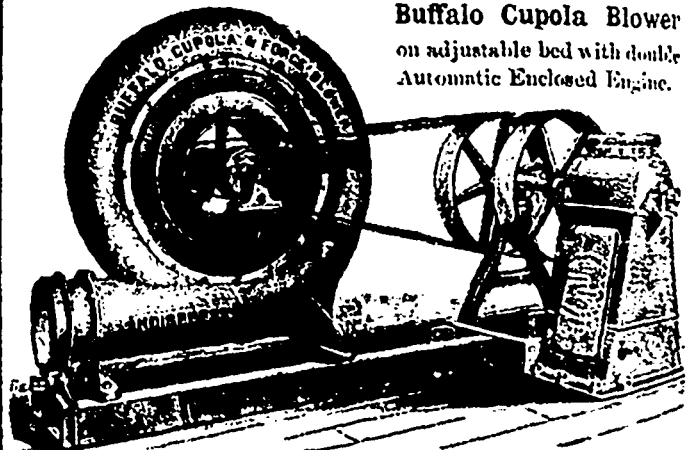
BLAST HEATING SYSTEM FOR LARGE BUILDINGS

Little Wonder Boiler and new Hot Water Heating System half price of usual hot water system. STEAM BOILER CLEANERS, Feed Water Heaters covered by Patents of recent date in Canada and United States.

Second-hand Heaters and Fans made by the best American Manufacturers, only in use a short time, for sale at great reduction.
 Send for Illustrated Catalogue and Prices to

MCEachREN HEATING & VENTILATING CO.

GALT, ONT.



Buffalo Cupola Blower
 on adjustable bed with double
 Automatic Enclosed Engine.

Buffalo Dry-Kilns, Shaving Fans, Forges,
Blowers, Exhausters, Black-
smith Drills, Etc.

Are described in Sectional Catalogues FREE on application

Their Efficiency, Smooth Running and Durability
 are Unsurpassed.

Buffalo Forge Co., Buffalo, N.Y., U.S.A.

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Toronto, Ont., by H. W. Petrie.

Brantford, Ont., by Canadian Machinery and Supply Co.

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New York Office—26 Cortland Street

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 Wm. Wilkinson, Brampton.
 Mann Mfg Co., Brockville.
 J. Hergott & Co., Mildmay.
 Macdonald Mfg Co., Stratford.
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ON GROUNDS.

Gurney Tilden & Co., Hamilton. - Stoves.
 Pellar Metal Roofing Co., Oshawa.
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 Page Wire Fence Co., Walkerville.
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 D. Plows, Toronto. - Pumps.
 W. Loustaff, Weston. - Pumps.
 Ontario Wind Engine & Pump Co., Toronto.
 G. I. Shapley & Muir Co., Brantford.
 G. W. Green, Peterboro'.
 Wind Motor Co., Woodstock, Ont.
 Stratford Bridge & Iron Works, Stratford.
 Dominion Organ & Piano Co., Bowmanville.
 Hamilton and Toronto Sewer Pipe Co., Hamilton.

CAPTAINS OF INDUSTRY.

The following items of information, which are classified under the title "Captains of Industry," relate to matters that are of special interest to every advertiser in these pages, and to every concern in Canada interested in any manufacturing industry whatever, this interest extending to supply houses also.

If a new manufacturing enterprise of any kind is being started, or an electric lighting plant instituted, or an electric railroad, or a telephone, or a telegraph line is being constructed; or a saw mill, a woolen, cotton, or knitting mill; or if any industrial establishment has been destroyed by fire with a probability of its being rebuilt, our friends should understand that possibly there may be something in the event for them. Do you catch on to the idea?

The starting of any such concern means a demand for some sort of machines, machinery, or supplies, such as steam engines and boilers, shafting, pulleys, bolting, lubricants, machinery supplies, wood or iron working machinery, ventilating and drying apparatus; pumps, valves, packing, dynamos, motors, wire, arc and incandescent lamps, and an infinite variety of electrical supplies, chemicals, acids, alkalis, etc. It is well worth the while of every reader of the Canadian Manufacturer to closely inspect all items under the head of Captains of Industry.

The city electrician of Halifax, N.S., is preparing an estimate of the cost of remodeling the fire alarm system.

Messrs. Leitch & Turnbull, Hamilton, Ont., have been awarded the full wing contracts -- One hydraulic elevator, John P. Graham, Windsor, N.S.; two hand-power elevator, Wyatt Block, Winnipeg, Man.; one hand-power elevator, Gurney-Tilden Company, Winnipeg, Man.; one hand-power elevator, Union Shoe and Leather Company, Winnipeg, Man.; one belt-power elevator, Welland Vale Manufacturing Company, St. Catharines, Ont.; one belt-power elevator, Government Printing Company, Victoria, B.C.; one hand-power elevator, F. Krug, Tavistock.

David Hennigar's saw mill at Noel, N.S., has been burned.

Goldie & McCulloch Company, Galt, have been awarded the contract for an engine for the Goderich Electric Light Works, and the Packard Electric Company, St. Catharines, secured the order for the transformers.

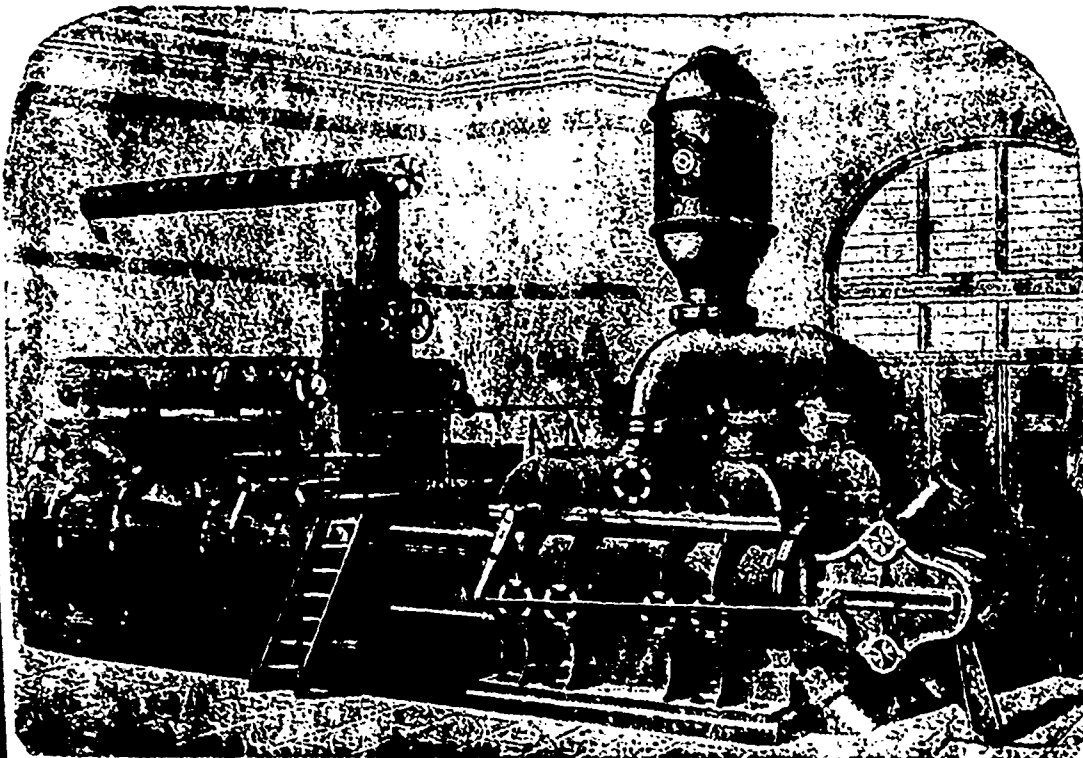
The corner stone of the Lachine Hydraulic and Land Company's main dam and power house was laid on the 12th instant. The dam, which extends into the Lachine Rapids, is 4,000 feet long, and the main dam is 1,000 feet in length. It is expected that 80,000 horse-power will be generated. The company expect to be able to supply light and power to Montreal by the middle of November.

The Cobban Manufacturing Company, Toronto, expect to take possession of their new factory on the Lake front, near Union Station, about the first week in October.

JOHN McDOUGALL

CALEDONIAN IRON WORKS,

MONTREAL, QUEBEC



General Agents
 in Canada for
 THE FAMOUS

**Worthington
 Pumps**

**Hydraulic
 Machinery**

Condensers

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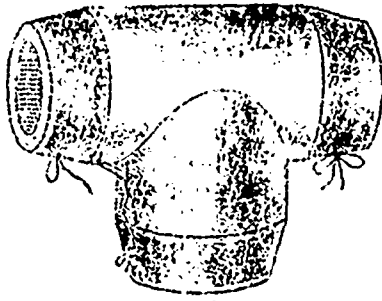
**Water Works
 Supplies**

WORTHINGTON PUMPS ARE UNEQUALLED FOR EFFICIENCY AND ECONOMY

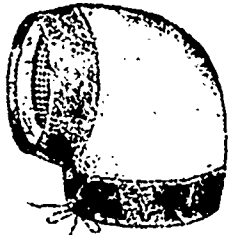
MICA BOILER and STEAM PIPE COVERING

THE CHEAPEST IN THE MARKET

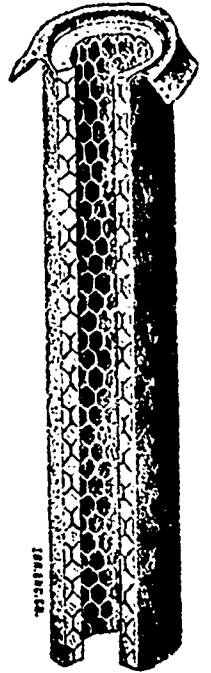
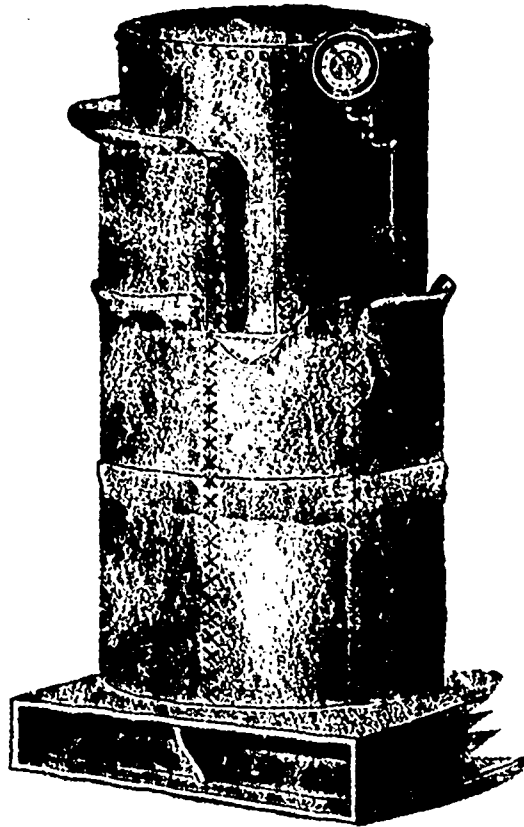
...Durable, Flexible and a Magnificent Non-Conductor of Heat...



TEE



ELBOW

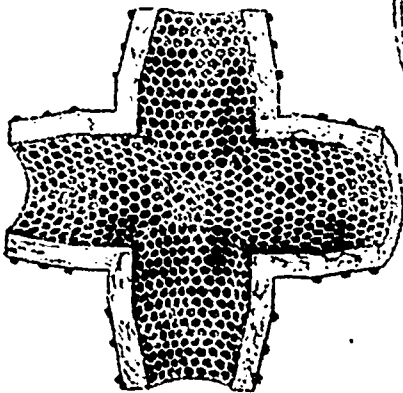


Made in Sections to Fit
all Sizes of Pipes

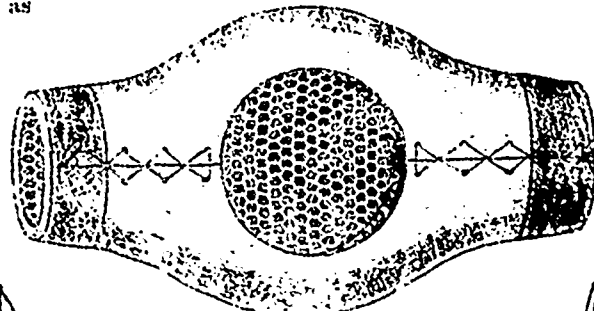
And can be removed and replaced as
often as desired.

Adjustable
Mica Coverings .

For all kinds of Fittings



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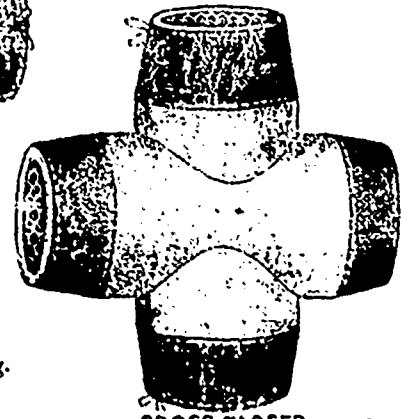


GLOBE VALVE.

Mica Covering Cannot be
Affected by Vibration

.... And will not shift or sag.

Write for reports of trials, testimonials, etc., to



CROSS CLOSED.

THE MICA BOILER COVERING COMPANY, Limited

9 JORDAN STREET, TORONTO.

Geo. S. Baldwin, Aurora Ont., will improve his flour mills by adding two planifiers and some purifiers.

The city engineer of Windsor, Ont., has been instructed to prepare plans, etc., for a system of sewerage in the south-west part of the city, estimated to cost about \$8,000.

J. W. Howry & Son's saw and shingle mill at Fanelon Falls, Ont., was burned on the 9th instant. Loss \$40,000.

An electric light plant will probably be installed in the asylum at Brockville, Ont.

The annual meeting of the Canadian Furniture Manufacturers' Association was held on the 5th inst., in the Caledonian Rink, Toronto. Mr. J. S. Anthes of Berlin was elected president. The other officers elected are vice-president, Simon Snyder, Mayor of Waterloo; treasurer, J. Baird, Plattville; secretary and solicitor, J. R. Saw, Toronto.

The Sherbrooke Telephone Company of Sherbrooke, Que., is building 100 miles of new lines.

The Royal Electric Company recently furnished a 20-K.W. alternating plant for the Markham Electric Light Company, Markham, Ont.

The Royal Electric Company, Montreal, is installing an electric light plant in the agricultural implement works of B. Bell & Sons, St. George, Ont. They have also furnished ten car equipments, and one 25-K.W. railway generator for the Montreal Park and Island Railway Company, and a thirty h.p. "S. K. C." two-phase motor for La Com-

pagnie Electrique; one "S. K. C." alternating current dynamo having a capacity of 1,000 sixteen candle power lamps for the town of Newmarket, and one 75-K.W. "S. K. C." transformers of 500 light capacity for McMaster Bros., Ridgetown, Ont.

Messrs. Goldie & McCulloch Company, Galt, Ont., recently secured an order for an eighty h.p. Wheelock engine with condenser, boiler and shafting, from the Gravenhurst Electric Light and Power Company. The Royal Electric Company furnished a 50-K.W. "S. K. C." alternating generator and switchboard, and an 18-light 6 1/2 ampere "T. H." Royal arc dynamo, with lamps for the same concern.

The Nova Scotia Telephone Company have just completed their new wire between New Glasgow, Pictou and Truro, connecting at Truro with their long-distance line at Halifax.

W. A. Fraser's saw mill, Little Current, Ont., was burned Sept. 6th. James Bottom & Spencer, Leves, lost \$10,000 worth of lumber. Mr. Fraser's loss, \$5,000.

The Ruthven Company has received orders for eighteen carloads of charcoal for the Radnor forges in Quebec.

C. W. Thomson, Newburgh, Ont., has leased the Napanee Mills' paper mill, and will soon have it running full time.

A gold brick, weighing 395 pounds, 5 1/2 ounces, and valued at \$31,622, was on exhibition for several days at the Bank of Montreal, Toronto. The brick was the product of the first wash-up of this season of the Cariboo Hydraulic Mines, 195 miles north of Ashcroft Station, B.C.

It is rumored that the Sanford Manufacturing Company, of Hamilton, will remove to Toronto.

George Mills, Hamilton, has been awarded the contract to build the new G.T.R. shops in London, Ont.

Word comes from Vancouver, B.C., that provided satisfactory arrangements can be made with the C.P.R., an ore smelter and refinery will be established there. W. R. Rust, of Tacoma, Washington, is the organizer of the project.

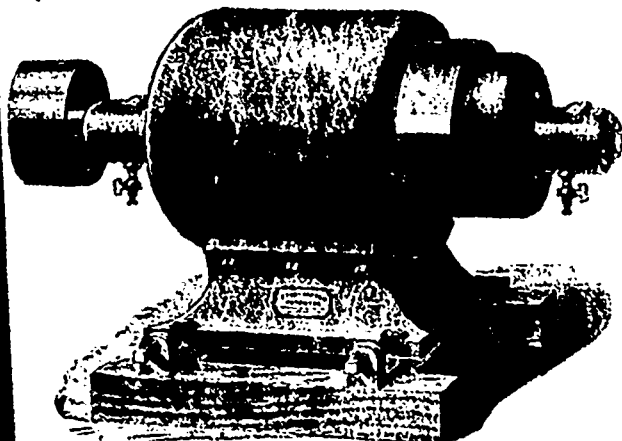
A boiler in Pettit Bros.' hoop and stave mills, near Comber, Ont., exploded on the 16th instant, completely wrecking the engine and part of the mill.

The Pictou Fruit and Preserving Company, Pictou, Ont., has commenced business.

Mr. Pusey, manager of the Irondale, Bancroft and Ottawa Railway, has been making efforts to get American capitalists to put some capital into our iron and other properties. He describes an enthusiastic meeting held at Bancroft some days ago, when the scheme to bonus the iron smelting furnace which the company proposed to build was fully endorsed, and the various amounts to be borne by each of the nine townships was apportioned. The date on which the by-law will be submitted to the people was not definitely decided, but it will be some time in October. "When the furnace is erected," said Mr. Pusey, "it will give work to about seventy-five men, and if the mines are worked some 1,000 more will be attracted to the district."

Joseph Grise has started a grist mill at Acton, Que.

The STOREY MOTOR and DYNAMO



See for Catalogue.

MANUFACTURED BY

The STOREY MOTOR and TOOL CO.

John St. North, Hamilton, Can., and Philadelphia.

ROSAMOND WOOLEN COMPANY

ALMONTE, ONT.

FINE TWEEDS, CASSIMERES, AND FANCY WORSTED SUITINGS AND TROUSERINGS

FERGUSON & PATTINSON

PRESTON, ONTARIO.

MANUFACTURERS OF

FINE AND MEDIUM TWEEDS

Guelph Woolen Mill Co., Ltd.

GUELPH, ONTARIO

Manufacturers of

Underwear, Hosiery, Wheeling, Fingering and Worsted Yarns

EIDERDOWN FLANNEL, ETC.

Selling Agents: Donald Fraser, Montreal E. H. Walsh & Co., Toronto.

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Manufacturers of

VARNISHES AND JAPANS | Importers of Oils, Paints, Colors,

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AUBURN WOOLEN COMPANY

PETERBOROUGH, ONT.

Manufacturers of Fancy Tweeds, Etc.

Selling Agents: D. MORRICE, SONS & CO., Montreal and Toronto.

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Manufacturers of

HOSIERY, SHIRTS, DRAWERS, GLOVE LININGS AND YARNS

Selling Agents: D. MORRICE, SONS & CO., Montreal and Toronto.

Babbitt

Metal.



BRASS, BRONZE, PHOSPHOR BRONZE, ALUMINUM BRONZE, COPPER, ZINC and ALUMINUM CASTINGS TO ORDER. Large or Small.

Write for Prices.. **DEAN BROS., 184 Richmond St. West, Toronto**

The St. Anthony Lumber Company are building a new dam at Whitney across the Madawaska.

The Lamont Glass Company of New Glasgow, N.S., manufacturers of glass chimneys, fruit jars, bottles, etc., have doubled their works during the past two years, and now employ seventy hands, with a pay-roll of \$500 a week. They contemplate going into the manufacture of electric light bulbs and shades.

Work has begun on the new aqueduct bridge, at Woodstock, N.B., which supports the ten-foot pipe carrying the water across the Meduxnakik from the north to the south side of the town. The old bridge of wood had been in place something over a dozen years. This year the council decided to build a steel bridge. The structure is under contract to the Dominion Bridge and Iron Company, Montreal.

The Mica Boiler Covering Company, 9 Jordan street, Toronto, have issued a booklet giving the history of the introduction of mica as a covering for boiler and steam pipe coverings, the methods of manufacture, its adaptation as suitable covering for fittings, elbows, tees, crossings, etc., and an account of various tests, including that made by the Canadian Pacific Railway Company. An elaborate chart accompanies the account of the latter experiment, and will be of interest to users of steam.

The Jarvis Bicycle Saddle Company of Toronto is being incorporated with a capital stock of \$20,000.

The Queen City Oil Company, Toronto, is being incorporated with a capital stock of \$200,000.

The Western Ontario Mining Company, Rat Portage, is being incorporated with a capital stock of \$1,000,000.

The Iron Capping Gold Fields Mining Company of Toronto, city of Toronto, capital stock \$1,250,000, is being incorporated.

The Consolidated Railway and Light Company, Vancouver, B.C., will instal another dynamo, owing to increase of business.

The Orillia (Ont.) Asylum authorities are having eight of the boilers of the institution fitted with the Jones Under-Feed Mechanical Stoker, made by the Weeks-Eldred Company, Toronto.

D. A. Nease, an American capitalist, has been in the Port Arthur district investigating the resources and advantages of that region for the pulp grinding industry.

The Noble Five Consolidated Mining and Milling Company, Spokane, Wash., capital stock \$1,200,000, has been registered in British Columbia.

The following companies are being incorporated in British Columbia:—The Badger-Tourmaline Consolidated Gold Mining Company, Rossland, capital stock \$1,500,000; the Mainland Logging Company, New Westminster, capital stock \$5,000; the Seymour Creek Gold Mining Company, Vancouver, capital stock \$1,000,000; the Mount Mabel Mining and Smelting Company, New Denver, capital stock \$1,500,000.

A company of Quebec city capitalists is in process of formation to construct an electric street railway in that city. The capital stock is placed at \$400,000, of which a large amount has already been subscribed.

There is said to be an effort on foot to place on a practical footing the scheme to build a bridge from Quebec City to the south shore of the St. Lawrence. The Local and Federal governments are depended upon to bonus the scheme.

The Moto-cycle Company of Canada, Montreal, is being incorporated.

The traction engine is growing in popularity among the English farmers, not alone for threshing, but for hauling loads and plowing. The modern machines are handsome and almost noiseless, and draw 30 to 50 tons on fairly good roads.

The sale of the Tuskat River Lumber Company's property, mills at Tuskat, N.S., and 12,000 acres of timber land in Digby county chiefly, has been completed. The purchasers are a Stewiacke, Colchester Co., syndicate, and the price paid was \$40,000.

Last year the price of gas in Glasgow was reduced 2d. per 1,000 cubic feet, involving a total saving to the rate-payers of between £30,000 and £40,000. The result of the year's working has been so favorable that the Gas Committee of the Corporation have agreed to recommend a still further reduction of 1d. per 1,000 cubic feet, making the price now 2s. 6d., the lowest on record.

The Glasgow corporation, as is now well known, have decided to adopt the trolley. We do not suppose they are far wrong, as the conduit and stud, whether button or rail, have not yet been shown to be free from very serious disadvantages.—Electrical Review.

There are about 450 miles of street railway in the State of Michigan, operating 1,100 cars and employing 5,000 men.—Electrical Review.

The Montreal Steam Laundry Company's premises, Montreal, were burned on Sept. 10th. A large quantity of valuable machinery was destroyed. Loss about \$100,000.

The Montreal Construction Company, Montreal, has been incorporated with a capital stock of \$500,000 to carry on the business of contractors in connection with all works for the development of or in connection with the use of motive power of any kind whatever.

The New Barnes Cycle Company, Woodstock, Ont., contemplate the erection of an additional factory room 80 x 180 feet.

The Hamilton Radial Electric Railway opened their new road to Hamilton Beach and Burlington on the 7th instant.

F. F. Dalley & Company's Works, Hamilton, were damaged by fire on the 11th instant to the extent of about \$3,000.

The Hamilton Radial Railway Company intends to extend its line from the power house to Port Nelson, and next spring it will be extended to Oakville.

The Fredericton Boom Company, Fredericton, N.B., has so far rafted this season 115,000 feet of lumber, of which 95,000,000 is spruce.

BREWERS

COPPER

WORK

Brewing Kettles, Boiling Coils,
Beer Coolers, Attempartors
Spargers, etc., etc.

—THE—

BOOTH COPPER CO.

LIMITED,

TORONTO, ONT.

Established 1854.

H. W. KARCH

HESPELER, ONT.

IRON FOUNDER and MACHINIST

MANUFACTURER OF

WOOLEN . . . MACHINERY

FULLING MILLS;
CLOTH WASHERS,
WOOL & WASTE DUSTERS
DRUM SPOOL WINDERS,
REELS,

Spooling & Doubling Machines,
Ring Twisters, Card Creels,
Rag Dusters,

Dead Spindle Spooler

(For Warp or Dresser Spools),

Patent Double-Acting Gigs,

Dyeing Machines.

ALCOMA IRON WORKS

SAULT STE. MARIE, ONT.

Engineers Founders

AND

Machinists

PULP AND PAPER MILL

AND

MINING MACHINERY

DESIGNED, CONSTRUCTED AND
REPAIRED

Tilsonburg, Ont., is to have a new town hall 102x54 feet, the contract calls for its completion by May 1, 1897.

Messrs. Parr, Rowe and Graham, and the Ottawa Electric Light Co., Ottawa, are re-arranging the flumes in connection with their water power at the Chaudiere.

London, Ont., has voted to spend \$150,000 for sewage purposes.

The latest addition to the manufacturing industries of Gananoque, Ont., is the Canada Corner Wire Co.

Messrs. Rhodes Curry & Co., Amherst, N.B., have received an order for ten flat cars from the Coast Railway and 1,500 car wheels for the Intercolonial.

Dundalk, Ont., people are discussing the advisability of lighting their town by electricity.

R. J. Lund, Windsor, Ont., who purchased Mr. Creighton's chopping mill at Combar last spring, has completed re-modeling the mill to the full roller process for making flour, at a cost of \$7,000.

The Lake Superior Power Company is pushing on with the works at the Michigan Soo for the manufacture of calcium carbide, and arrangements are being made for laying a cable across the St. Mary's River, where with the machinery of this industry will be driven from the works at the Canadian Soo.

Coal has been struck by the Manitoba Government well-boring machine, near Cartwright, at a depth of sixty-two feet.

The Georgetown Paper Mills, Georgetown, Ont., have started up after a fifteen days shut down to put in new machinery. A new wire part and three wet presses, a driving cone, new pulleys and a suction pump have been added. There has also been put in a 100 h.p. engine and a seventy h.p. boiler.

The Brantford Bicycle Company sent three carloads of bikes to Australia per steamer Miowera which sailed from Vancouver, B.C., Sept. 8th.

Fowler & Calhoun, who carry on an extensive milling business at St. John, New Brunswick, will soon start up their corn meal mill at that place, which will have a capacity of 400 barrels per ten hours. They are also contemplating the erection of a flour mill to have a capacity of 200 barrels per ten hours, and a large elevator.

At a recent meeting of the Preston (Ont.) Council a resolution was passed to grant a loan of \$10,000 to Mr. Stevens, late of the firm of Stevens, Hamilton & Company, Galt, Ont., manufacturers of iron-working machinery, to start a factory in Preston.

FOR SALE.

VALUABLE WOOD-WORKING FACTORY AND STEAM SAW MILL

Owner's health obliges him selling part or whole interest in the business. Factory new and thoroughly equipped—now doing a good business. Rapidly located at harbor and railroad station. In a growing town of over three thousand inhabitants, with six rapidly growing coal mining towns, with populations from two to three thousand each, from six to fifteen miles from factory. Large quantities of timber at hand, with unlimited market for lumber and manufactured material. This is a grand opportunity for party desiring to engage in manufacturing wood or lumbering business. For further particulars write to "K. J." care of the Canadian Manufacturer, corner Melinda and Jordan Streets, Toronto.

Wm. KENNEDY & SONS, OWEN SOUND, ONT.

MANUFACTURERS OF HIGH-CLASS

WATER WHEELS,

Electric Water Wheel Regulators,

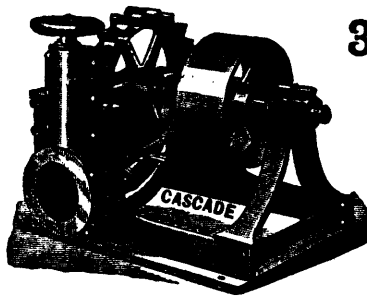
Machine-dressed Heavy Gearing, Shafting, Etc.

.... PROPELLER WHEELS AND MARINE REPAIRS A SPECIALTY....

TURBINE AND CASCADE WATER WHEEL

Adapted to all Heads from

3 Feet to 2000 Feet.



Our experience of 33 YEARS building Water Wheels enables us to suit every requirement of Water Power Plants. We guarantee satisfaction.

Send for a Pamphlet of either Wheel and write full particulars.

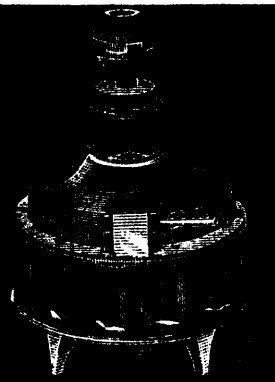
JAMES LEFFEL & CO.
SPRINGFIELD, OHIO, U. S. A.



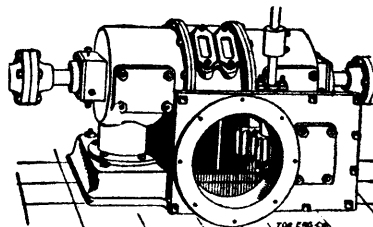
Burnham's

NEW IMPROVED STANDARD TURBINE

BURNHAM BROS., York, Pa.



"LITTLE GIANT" TURBINE



One Type of Horizontal.

Built in 17 Standard Sizes and 27 Special Sizes, making a range of 44 different wheels in vertical and horizontal cases.

We solicit correspondence from those interested in developing or improving water power.

.... ADDRESS....

J. C. WILSON & CO., Glenora, Ont.

DESCRIPTION OF THE IMPROVED JONES UNDER-FEED MECHANICAL STOKER.

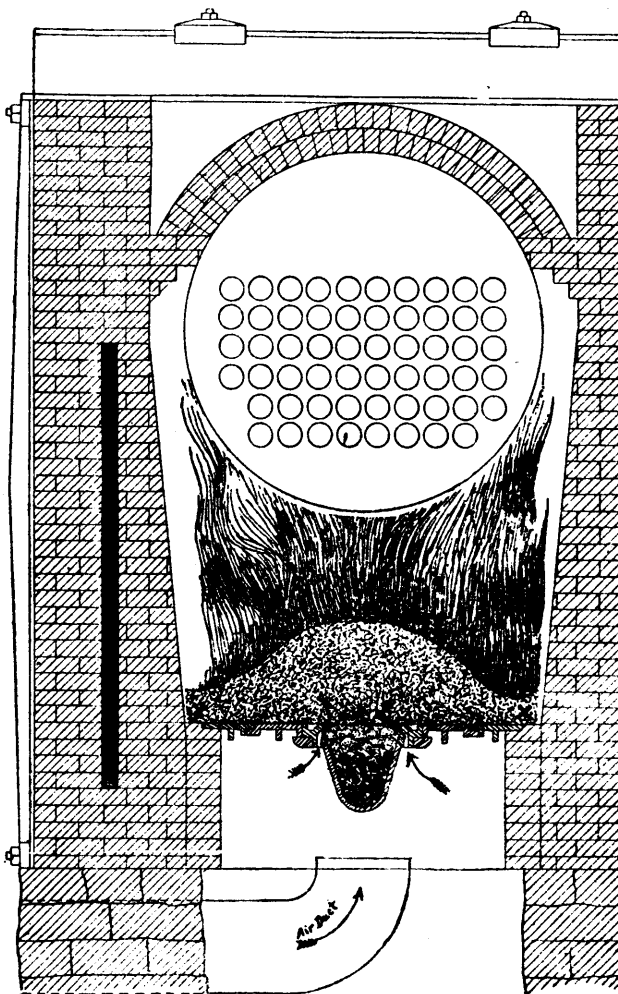
Within the past twelve months a new device in connection with furnace firing has been brought to the attention of Canadian manufacturers; this is the Improved Jones Under-feed Mechanical Stoker, which we illustrate herewith.

The stoker consists of a steam ram, or cylinder, with hopper for holding coal outside of furnace proper, and a retort or fuel magazine inside the furnace. Into this retort fuel is forced by means of the ram. Not grate-bars, but dead plates are used, and all air supplied for combustion is forced by means of a blower through tuyere blocks placed on each side of the retort. The ash-pit is used for an air chamber. A small auxiliary ram is placed at lowest point in bottom of retort, at a point where the fire never reaches, as all of air supply comes in at grate line. By means of the rams, coal is forced with even distribution underneath the fire, each charge of fuel raising the preceding charge upwards until it is forced into the fire. As the green coal lies directly underneath the burning mass of fuel above, it becomes coked and the gases are liberated. Above this coking fuel and below the burning mass the air is admitted through the tuyeres, mixing with the gases given off. The mixture of gas and air passes upwards through the burning coke and is consumed, thus giving, the makers claim, the benefit of all the combustible matter in the fuel. It may be said that this stoker works on the principle of a Bunsen burner, which gives one of the hottest, most economical flames known to science.

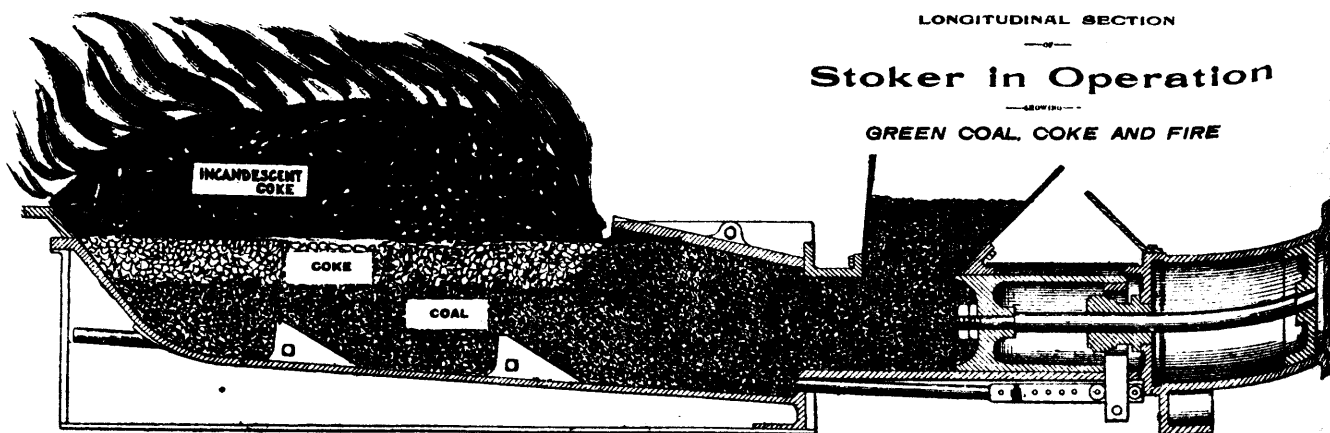
By the use of this stoker, only gases and coke come in contact with the fire, consequently no smoke, clean tubes, no ash. The refuse from firing passes off through the stack in the form of non-combustible gases and the minerals, sand, etc., contained in coal, falling down the mound of burning fuel and upon the dead plates at points x, as shown in cut B. The fire in ordinary cases needs to be cleaned but once a

erate a few as follows:—First—Economy in the use of fuel brought about by liberating all the gases from the fresh fuel under the burning fuel, and by causing all the gas from the same, thoroughly mixed with air, to pass through a body of burning coke at a high temperature, thereby consuming all the heat producing elements, and also by avoiding the waste of small particles of unconsumed fuel that unavoidably pass through an ordinary grate-bar. Second—A furnace adapted to the use of any kind of fuel, especially screenings or other fine fuel. Third—A smokeless stack. Fourth—Simplicity of construction. Fifth—A furnace at all times under complete control of the operator. Sixth—A furnace that can be operated by any practical fireman. Seventh—Durability. Repairs cost no more than when ordinary grates are used, and oftentimes less. Eighth—A furnace without any mechanical movement subject to the action of the fire. Ninth—A furnace in which the proper quantity of air can always be diffused through the burning coal to produce perfect combustion. Tenth—A furnace that can be applied to any boiler. Eleventh—Great range of steaming power, it being possible to increase steam pressure almost instantly. Twelfth—Clean tubes, there being no smoke. Thirteenth—Ease and rapidity in cleaning fires. The retort keeping itself clean, there is little else to clean. Fourteenth—Ability to put the coal where it is needed, when it is needed.

It is claimed that this furnace will burn any kind of bituminous coal or lignite, slack or screenings, and will fully utilize all heat-giving elements contained therein; and that whether good coal or refuse slack or screenings are used, this device when properly operated insures a substantially smokeless stack. Also that the device will increase the capacity and efficiency of boilers, and by its use even the non-fluctuating heat saves wear and tear of the boilers, thereby adding to their durability. The use of this device require no change in boilers proper, the only change being in the furnace. This is so small a change that installation can be made without experiencing trouble from



CROSS SECTION, SHOWING FURNACE IN OPERATION.



LONGITUDINAL SECTION

Stoker in Operation

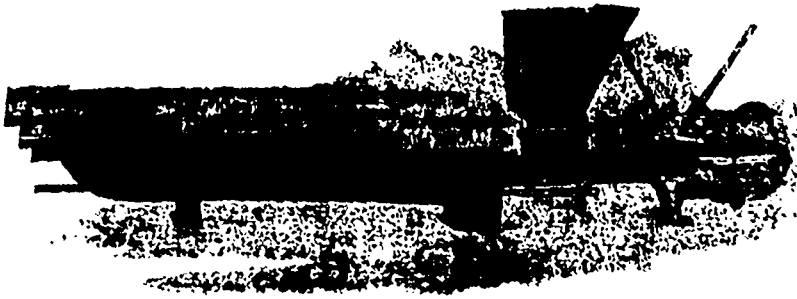
GREEN COAL, COKE AND FIRE

day, and does not take five minutes a day for each furnace, it is said. At all other times the doors should be kept closed. All that is required of the fireman is simply to keep coal in the hoppers and handle the lever as the furnace requires stoking.

Among the many advantages claimed for this device we enum-

loss of time. An exhibit of this stoker was made at the late Industrial Exhibition at Toronto, where it attracted considerable attention.

On opposite page is published a test copied from the original record sheets of the Calumet & Hecla Mining Co., Calumet, Mich.



Three hundred h.p. boilers fired by two improved Jones under-feed mechanical stokers, March 25th to 30th, 1895 :

Time.	Lbs. Coal.	Lbs. Water.	Ash.	Feed Water.	Steam Pressure.
Night 7 p.m. to 7 a.m.....	15,500	142,800	343	111.8	119.4
Day 7 a.m. to 7 p.m.....	14,500	135,600	757	103.7	118.8
Night.....	16,000	148,800	371	106.9	118.9
Day.....	15,000	141,600	812	101.5	117.7
Night.....	14,750	134,400	649	105.	118.2
Day.....	13,500	128,400	1225	106.2	116.9
Night.....	14,250	132,000	325	103.1	116.3
Day.....	14,500	142,800	1062	101.2	119.1
Night.....	15,000	134,400	358	101.7	117.2
Day to 4 p.m.....	11,250	106,000	767	102.3	118.
Night 4 p.m. to midnight.....	10,000	107,600	1224	100.2	118.5
Totals.....	154,250	1,456,403	7896	1159.6	1209.
Average.....				105.4	118.1

Evaporation lbs. water per lb. coal at observed temperature..... 9.5
 " " " " from and at 212..... 10.98
 " " " " combustible at temp..... 9.95
 " " " " from and at 212..... 11.39

Duration of test, 125 continuous hours. Lbs. coal per hour, 1,234. Stokers fired by inexperienced operators one-half of time.

For further information address The Weeks-Eldred Co., Toronto, who are sole manufacturers for Canada.

Chicago expects to have a tower which will be the highest structure of its kind ever constructed. It is to be called the city tower, and will be 1,150 feet high and 300 feet square at the base. The first landing will have a capacity to accommodate 22,000 people. The tower company is an incorporated one, capitalized at \$800,000, having for its president D. R. Proctor, and will rear this lofty steel skeleton on the old baseball park property, owned by New York people, for which a lease for a term of years has been secured. The enterprise is based on business lines and the projectors of the scheme intend to equip the tower with a theatre, restaurant, etc. The tower, its promoters say, will surpass the famous Eiffel tower in Paris in point of magnificence and appointment. — The Age of Steel.

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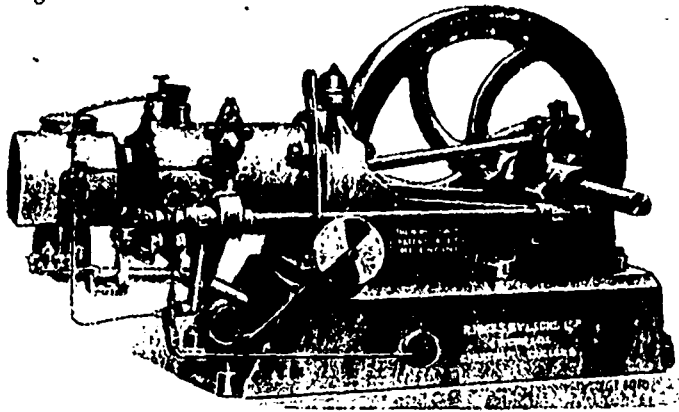
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THE HORNSBY-AKROYD OIL ENGINE.

The Northey Manufacturing Company, Ltd., Toronto, well-known throughout the Dominion as builders of high class pumping machinery, have lately entered upon the manufacture of the Hornsby-Akroyd Oil Engine.



This engine, as will be seen from the illustrations, is a very compact and simple machine, and one which will prove very useful in a great many situations in which the steam engine is neither so convenient nor so economical. In the oil engine the power is produced direct from a low grade of petroleum by internal combustion, without the intervention of a boiler or steam in any form. The one which the Northey Mfg. Co., Ltd., is about to put on the Canadian market, works on what is known as the "Otto Cycle," which may be briefly explained as follows:—

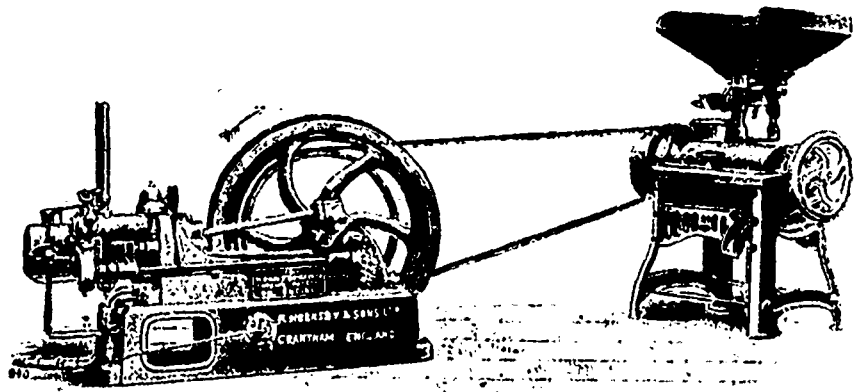
- 1st.—The admission of atmospheric air into the cylinder during the forward movement of the piston.
- 2nd.—The compression of this air during the backward movement of the piston, and its intimate intermixture with the gas vapor previously introduced into the vaporizer.
- 3rd.—The expansion by combustion of the mixture of gas and air in the cylinder.
- 4th.—The expulsion of the spent gases by the piston.

In starting the oil engine the small lamp, fed by the same oil as is used in the engine, is lighted and placed under the vaporiser, which is the part immediately behind the cylinder proper. In about ten minutes the vaporiser is hot, and the engine ready to start. The fly-wheel is turned by hand a couple of revolutions, to draw air into the cylinder, and the engine then works automatically, giving out power in proportion to the work to be done, and running evenly and quietly without further attention, so long as the supply of oil is maintained. The manufacturers say the consumption of oil is less than one pint per horse power per hour, and a cheap oil is used costing seven and one-half cents (7½c.) per gallon. It will be noticed that the power in the oil engine is obtained from the expansion by combustion of a mixture of gas and air, the only fire while the engine is running is inside the cylinder, and the supply of oil is contained in a cast iron receptacle in the lead, secure from all danger. There are no sparks, no smoke, no ashes.

The engine is easily and quickly started, it can be used wherever power is required, and is especially advantageous where the room required for a steam boiler is not obtainable.

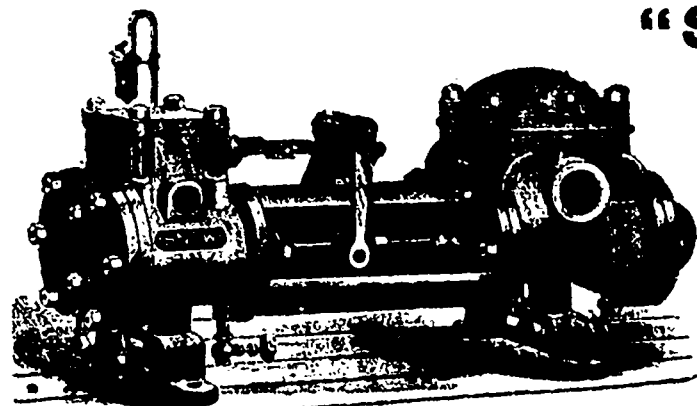
The manufacturers also call attention to the usefulness of this engine for threshing, as no large supply of water is required and the portable type is light and compact.

In combination with a pump they claim it affords a cheap and economical water-works for towns and villages; and the engine may be used, with excellent results, for driving dynamos for lighting and other purposes. For further particulars address The Northey Mfg. Co., King St. Subway, Toronto, Ont.



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Within the past six months 250 bicycles have come into use in Malaga, Spain; as yet, however, no one of the "el sexobello" (the fair sex) has had the courage to try the wheel.

A company is to be formed in Sweden for the smelting of ores on a large scale under the De Laval patents for electric smelting. The Swedish Government has granted a concession for the establishment of the company, which will have a capital of \$4,000,000. The water power at Trollhattan will be utilized. —Electrical Review.

What is said to be the tallest chimney in existence was built for the Metternich Lead Works, in Germany. It is 440 feet in height, eleven feet of which is underground. The foundation is of block stone, and thirty-seven feet square; the rest is of brick, thirty-four feet in diameter at the base, and tapering to 14 feet at the top. The tallest chimney previously constructed is that of the St. Rollox Chemical Works, near Glasgow, Scotland, which is 434 feet high. —Electrical Review.

Bradstreet's, Sept. 2nd, refers to a recent bulletin issued by Labor Commissioner Carroll D. Wright, in which it is shown that the estimated value of taxed real estate and un-taxed mines, in the United States in 1890 was \$36,026,071,490, on which there was a real estate mortgage debt, \$6,019,678,985. The mortgage debt is 16.71 per cent., or a little over one-sixth of the entire value.

The Montreal Star says: The total number of cattle shipped from this port to Europe from the opening of navigation to August 1st is a trifle above the total shipped in the same time last year. The sheep and horse trade, however, is very much behind last season, the former having fallen away over one-half. The total shipments from the opening of navigation to August 1st is as follows: 19,303 sheep, 44,842 cattle, and 3,935 horses, against 42,892 sheep, 44,627 cattle, and 6,642 horses for the same period last year. During the month of July the shipments were as follows: Sheep, 10,237; cattle, 16,062; and horses, 1,238.

CANADIAN PATENTS.

The following patents have been issued from the Canadian Patent Office, from June 27th, to July 16th, 1896.

Information regarding any of these patents may be had on application as follows:—

Fetherstonhaugh & Co., Bank of Commerce Building, Toronto.

Ridout & Maybee, 103 Bay Street, Toronto.

C. H. Riches, Canada Life Building, Toronto.

A. Harvey, Central Chambers, Ottawa.

Copies of any American patents can be procured from either of these attorneys for the sum of twenty-five cents each.

- 52,781 Elevator, C. I. Hall and the Park, Lacy Co., San Francisco, Cal.
- 52,782 Evaporator, The Hamilton Powder Co., Montreal, Que.
- 52,783 Corn silking machine, The Sprague Mfg. Co., Farnham, N.Y.
- 52,784 Foot guard for railway frogs, W. Driscoll, Brockville, Ont.
- 52,785 Cap, Gillespie, Analey & Dixon, Toronto.
- 52,786 Galvanic battery, E. S. Boynton, Brooklyn, N.Y.
- 52,787 Galvanic battery, E. S. Boynton, Brooklyn, N.Y.
- 52,788 Galvanic battery, E. S. Boynton, Brooklyn, N.Y.
- 52,789 Apparatus for treating nickel, ores, etc., L. Mond, Regent's Park, London, England.
- 52,790 Horn fly remedy, J. D. McLeod, Wigg, P.E.I.
- 52,791 Piston packing for cylinder head, J. G. Leyner, Denver, Col.

- 52,792 Driving gear for velocipedes, etc. W. J. Freeman and E. Freeman, both of 99 York Road, Battersea, Surrey, England.
- 52,793 Self-dumping, shipping and storing case, O. Greeno, Buffalo, N.Y.
- 52,794 Mucilage brush, J. F. Smith, Washington, D.C.
- 52,795 Grain drill, A. Stansel, Yorkville, Ill.
- 52,796 Lifting device, C. B. Ulrich, Ypsilanti, Mich.
- 52,797 Lifting device, D. N. Batterfield, New Boston, N.H.
- 52,798 Water heater, The Magee Furnace Co., Boston, Mass.
- 52,799 Steam engine, A. W. Edridge and M. Morrissey, Big Rapids, Mich.
- 52,800 Pile, The Taredo-proof Pile Co., San Francisco, Cal.
- 52,801 Stock and weed chopper, J. M. Flower and E. G. Morton, both of Potts Station, Ark.
- 52,802 Window screen, W. Scott, Leavenworth, Kansas.
- 52,803 Stock car, W. Cline, D. D. Good and S. B. Bitzer, all of Lancaster, Pa.
- 52,804 Ribs, etc., for umbrellas, R. P. Hull, H. K. Beck and Hattie M. Hawley, all of Norwalk, Ohio.
- 52,805 Crutch, D. J. Kennelly, Los Angeles, Cal.
- 52,806 Non-refillable vessel, E. A. Jukes, St. Catharines, Ont.
- 52,807 Wire fabric machine, W. DeL. Whitney, Clarendon, N.Y.
- 52,808 Electric signalling apparatus, L. S. Crandall, New York.
- 52,809 Moistener, H. U. Beck, J. R. Meadowcroft and W. J. G. Proctor, all of Montreal, Que.
- 51,810 Smoke consuming furnace, Porpro Antonovitch Archipenko, Kieff, Russia.

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- 52,811 Combination handle and support for cans and cases, T. W. Hickson, Point Nepean Road, Brighton, Victoria, Australia.
- 52,812 Staple puller, A. H. Russell, Mount Washington, Mo.
- 52,813 Adjustable folding vehicle top, E. Lenney, Potsdam, N.Y.
- 52814 Burial casket, W. C. Lantner, Detroit, Mich.
- 52,815 Oar, M. F. Davis, Detroit, Mich.
- 52,816 Oar, M. F. Davis, Detroit, Mich.
- 52,817 Shingle planer, K. L. J. Frazer, Winona, Minn.
- 52,818 Lumber truck, A. T. Bemis, Indianapolis, Ind.
- 52,819 Lumber truck, A. T. Bemis, Indianapolis, Ind.
- 52,820 Water escape and ventilator, A. B. Holmes, Scranton, Pa.
- 52,821 Road planer, J. C. Steel, Vaughan, Ont.
- 52,822 Combined trace releaser, hold back and brake, J. Lechner, Oswego, N.Y.
- 52,823 Adjustable pack saddle bridge, G. F. Fortier, Jeanerette, La.
- 52,824 Apparatus for operating and locking railway switches, C. H. Schager, Lilla Nygaten, Stockholm, and J. M. J. Lundin, Warton, both in Sweden.
- 52,825 Apparatus for automatically closing or opening doors, etc., Baron A. von der Ropp, Berlin, Germany.
- 52,826 Apparatus for sterilizing and purifying water, H. Tindal, Amsterdam, Holland.
- 52,827 Method of separating ores, E. Fearen, Maple Creek, N.W.T., and M. R. Newman, Toronto.
- 52,828 Fog signalling apparatus, C. Taylor, Sydney, N.S.W.
- 52,829 Bicycle seat, S. D. Van Meter, Denver, Col.
- 52,830 Skirt binding, DeL. MacDonald and A. C. MacDonald, both of Montreal.
- 52,831 Ironing table, etc., S. D. Kingsley, and E. Brown, both of Delevan, N.Y.
- 52,832 Grain separator, The Goldie & McCulloch Co., Galt, Ont.
- 52,833 Shoe holder, A. B. Crocco, New York.
- 52,834 Car fender, G. A. Weed, Water Mill, N.Y.
- 52,835 Gas check for projectiles, A. Nobel, Paris, France.
- 52,836 Safety arc lamp hanger, E. P. Snowden, St. Joseph, Mo.
- 52,337 Wrench, A. K. Lovell, New York.
- 52,838 Furnace, F. L. Bartlett, Canon City, Col.
- 52,839 Machine for making bicycle tires, H. J. Doughty, Providence, R.I.
- 52,840 Railroad tie plate, A. B. B. Harris, Bristol, Tenn.
- 52,841 Pneumatic tire plug tool, E. G. Hurt, Caldwell, Idaho.
- 52,842 Wrench, W. Dicks, Buffalo, N.Y.
- 52,843 Fire guard and soot catcher, G. A. Pickle, Eagle Lake, Minn.
- 52,844 Gate, D. W. Brooks, Salem, Nebraska.
- 52,845 Fodder cutter, J. Laughlin, York, Pa.

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for 1896, says—

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a semi-monthly, published at Toronto, Ont., and the publishers of the American Newspaper Directory will guarantee the accuracy of the circulation rating accorded to this paper by a reward of one hundred dollars, payable to the first person who successfully assails it.

- 52,816 Stall floor, C. B. Emery, Boston, Mass.
- 52,817 Shaft bearing, E. J. Armstrong, Oswego, N.Y.
- 52,818 Washing machine, W. Murphy, St. John, N.B.
- 52,819 Car coupler, F. G. Krammer, Chicago, Ill.
- 52,850 Cycle, J. E. Hatch, 240 Heath Terrace, West Bromwich, England.
- 52,851 Stove, J. A. Crossman, Auherat, and U. J. Weatherbee, Springhill, both in N.S.
- 52,852 Method of working steam engines, A. Hogg, 31 Morey Place, Dunedin, New Zealand.
- 52,853 Vaporizer for oil engines, Grover & Co., Britannia Works, Wharf Road, City Road, England.
- 52,854 Microscope, The American Microscope Co., New York.
- 52,855 Mechanism for operating car brakes, The La Rosa Car Brake Co., New Bedford, Mass.
- 52,856 Door lock switch for electric lights, W. E. Goucher, Jamestown, N.Y.
- 52,857 Wire fastener and stretcher, C. A. Gregg, Tuscola, Ill.
- 52,858 New alimentary extract, E. Kressel, London, Eng.
- 52,859 Gear for bicycles, T. W. Latham, Toronto.
- 52,860 Lubricating mechanism for locomotive cylinders and valves, H. P. Tippet, Columbus, Ohio.
- 52,861 Writing tablet, W. H. Keeran, Fort Wayne, Ind.
- 52,862 Counting and registering apparatus, J. McTammany, Spencer, Mass.
- 52,863 Boat propelling apparatus, C. M. Kimball, Toledo, Ohio.
- 52,864 Combination key and handle, A. G. H. Schroder, Altona, 21 Blumenstrasse, Germany.
- 52,865 Voting machine, J. McTammany, Spencer, Mass.
- 52,866 Apparatus and method for use in teaching swimming, W. J. Norley, Park Road, Portsmouth, Hampshire, Eng.
- 52,867 Mechanical toy and advertising machine, C. S. Pocock, Wandsworth, Surrey, Eng.
- 52,868 Device for use in press copying, W. S. Hampshire, Mount Vernon, N.Y.
- 52,869 Means for preventing accidents on railways, H. Biermann, 5a Paradiesstrasse, Breslau, Silesia, Prussia.
- 52,870 Self-propelling vehicles, boats, etc., G. A. Washburn, Cleveland, Ohio.
- 52,871 Ink stand, J. S. Parmenter, Woodstock, Ont.
- 52,872 Electrical exchange system, G. W. Hay and A. E. Parsons, both of Syracuse, N.Y.
- 52,873 Electrical signal, C. Holtmann, Pittsburgh, Pa.
- 52,874 Ball bearing, P. F. Turner, New York.
- 52,875 Ball bearing, P. F. Turner, New York.
- 52,876 Hot water furnace, L. N. Fortier, Ottawa.
- 52,877 Machine for trimming leather, E. Spear and F. L. Middleton, both of Washington, D.C.
- 52,878 Machine for cutting leather, E. Spear and F. L. Middleton, both of Washington, D.C.
- 52,879 Distilling apparatus, The Rolston Still Mfg. Co., Memphis, Tenn.
- 52,880 Trolley, J. Corcoran and A. T. Black, both of Harrisburg, Pa.
- 52,881 Box cover fastener, A. Berry, Warden, F. Wilson, J. Ward and J. S. Clunie, all of Montreal.
- 52,882 Printing press, M. L. W. Hollenbeck, Thornton, and J. B. Gibbs, Rosse, both in Texas.
- 52,883 Typewriter, The Wagner Typewriter Co., New York.
- 52,884 Ventilated boot, J. S. King, Toronto.

- 52,885 Safety envelope, R. Schaeffbaum, New York.
- 52,886 Means for securing window glasses, etc., R. Schaeffbaum, New York.
- 52,887 Combined pipe holder and vice, E. P. Fitzgerald, Lena, Ill.
- 52,888 Filter, J. F. Fischer, Worms, Germany.
- 52,889 Lawn mower sharpener, H. H. Howe, Stanton, Mich.
- 52,890 Bicycle brake, P. MacGregor, Ottawa.
- 52,891 Machine for cleaning rice, Gim Fong Yuen, Victoria, B.C.
- 52,892 Automatic telephone exchange system, W. F. Lounsbury, Geneva, N.Y.
- 52,893 Manufacture of ammonia and by-products, C. Preper, Berlin and C. Fellner, Frankfurt, both in Prussia.
- 52,894 Smoke consuming furnace, E. J. Reinisch, Lemberg, Austria.
- 52,895 Manufacture of sulphuric acid, N. P. Pratt, Atlanta, Ga.

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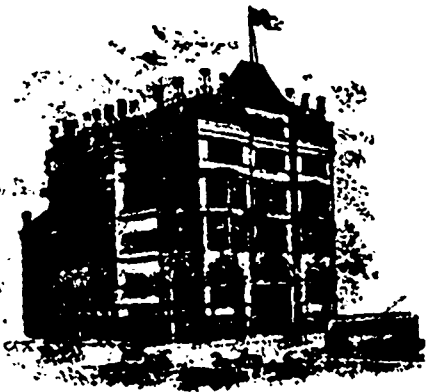
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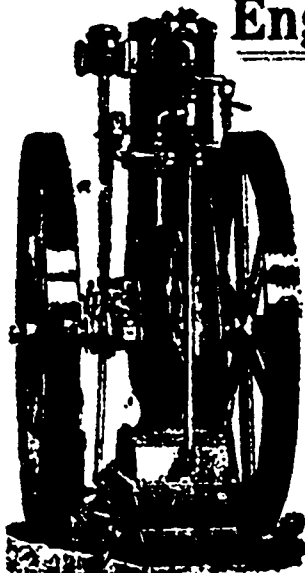


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- 52,896 Nut-lock, J. T. Peters, and G. E. Ward, both of Armstrong, W. Va.
- 52,897 Meat broiler, G. W. Aldrick, Brooklyn, N.Y.
- 52,898 Advertising desk, J. G. Ten Eyck, New York.
- 52,899 Attachment for skirts, Mary P. C. Hooper, New York.
- 52,900 Process of manufacturing Alkaline Dichromates, M. W. Beylikagy, Tenally, N.J.
- 52,901 Bandage, R. Jacks, Quincy, Cal.
- 52,902 Adding machine, C. C. Du Berger, jr., New Orleans, La.
- 52,903 Water closet seat, J. C. Felbiger, jr., New Orleans, La.
- 52,904 Wheel for cycles, busses, cars, etc., J. McConechy, Glasgow, Scotland.
- 52,905 Scarf pin, hat pins, etc., F. Foshem, New York.
- 52,906 Lock, N. Roy and J. P. Vallee, both of Montreal.
- 52,907 Cream separator, A. Wilson and T. Hocking, both of Montreal.
- 52,908 Bicycle frame, The America Cycle Mfg. Co., Chicago, Ill.
- 52,909 Extensible tip for shade rollers, W. B. Shaw and J. Myers, Hathoro, Pa.
- 52,910 Lock, M. Willis and G. Worthy, Toronto.
- 52,911 Curtain pole, Jean Baptiste Bedard, St. Henri, Que.
- 52,912 Bottle, C. P. Lundquist, Brooklyn, N. Y.
- 52,913 Handle fastening, R. Sanders, Crofeld Kingdom, Prussia.
- 52,914 Furniture caster, W. C. Bransden and C. R. Bransden, Brockton, Mass.
- 52,915 Shield for ink stands, R. G. Hopkins, Somerville, Mass.
- 52,916 Apparatus for advertising, G. C. Friecker, London, Eng.
- 52,917 Saddle for bicycles, etc., F. J. H. Hazard, Toronto.
- 52,918 Wind mill, J. Lemire, Drummondville, Que.
- 52,919 Pump, W. C. Buck, Peterborough, Ont.
- 52,920 Car coupler, C. D. Horgan, Victor, Col.

Walkerville, Ont., is improving its water service for fire protection by putting in a new waterworks pump of a capacity of 3,000,000 gallons, two new steel boilers 150 horse-power each, besides laying a number of new water mains in the principal streets.

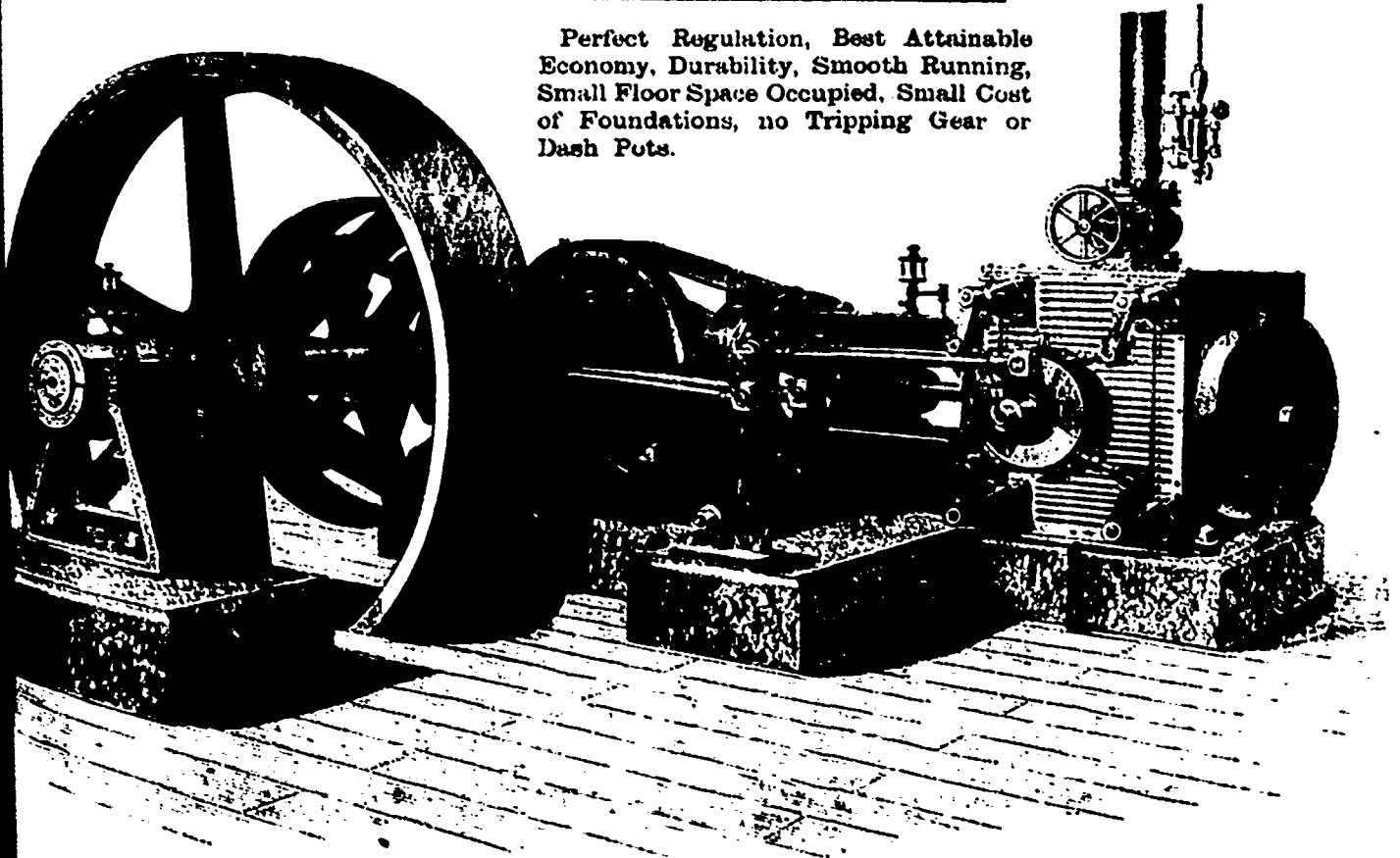
The new machine shop which is being erected at the Sault Ste. Marie (Ont., Pulp and Paper Company's works is being pushed forward rapidly to completion. Already some of the machinery is in its place.

The report comes from Montreal that the Richelieu River at Chambly is to be harnessed in order to secure electrical power for Montreal. It is said a contract has been given by Montreal capitalists to a Dayton firm to do the work for \$1,000,000, and the western firm are sub-letting contracts to the value of \$550,000, and a concrete dam 1,100 feet in length and twenty eight feet high will be built across the Richelieu, generating a force of 20,000 horse-power, the contract to be completed by October, 1897. The distance to Montreal will be fifteen miles, and it is quite probable that the Victoria Bridge will be used in getting the electric wire across the St. Lawrence. Permission will be asked at Ottawa to dam the Richelieu, but the promoters do not expect any difficulty in that direction. Amongst those interested in this new undertaking are President Holt of Montreal Gas Company and several of the directors of the Royal Electric Company, the latter, it is said, having engaged to take half of the power produced in the Richelieu. The new company at the Lachine Rapids will also have 12,000 horse-power to dispose of by the end of the year.

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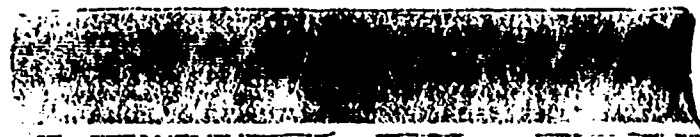
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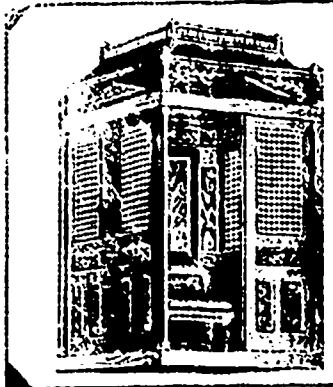


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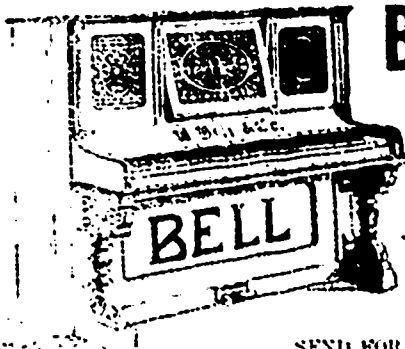
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