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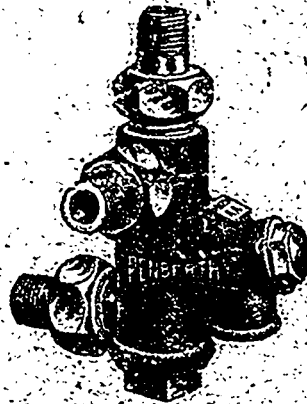
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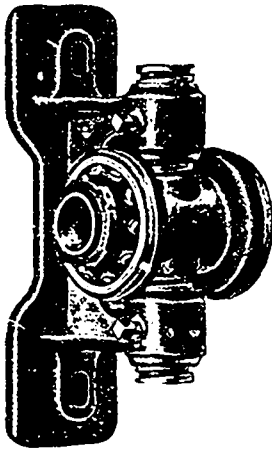


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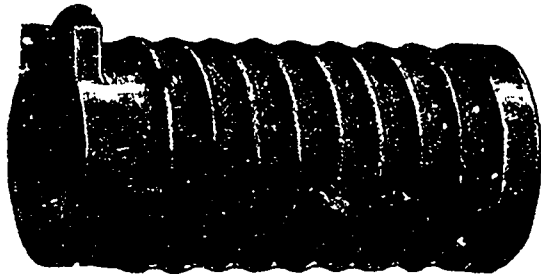
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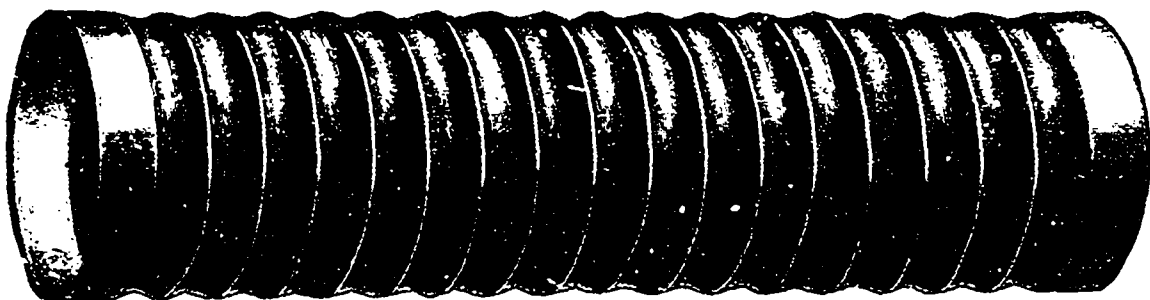


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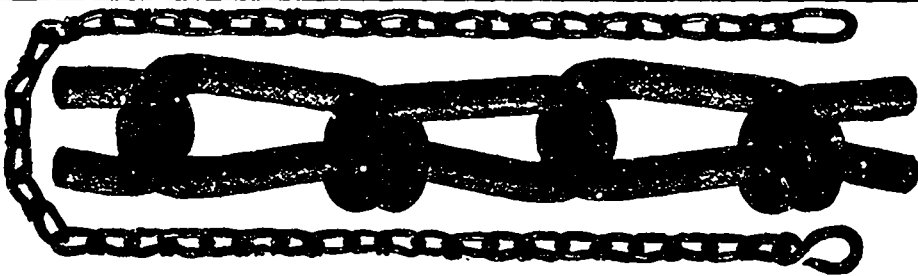
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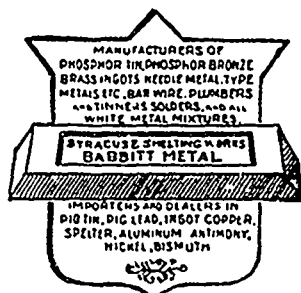
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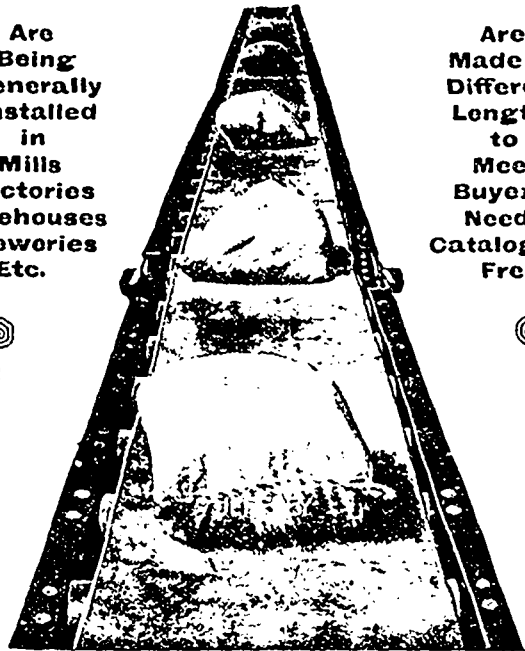
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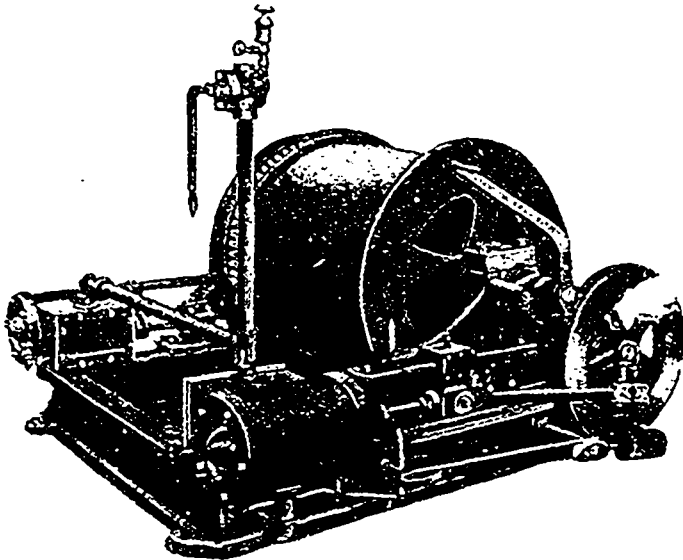
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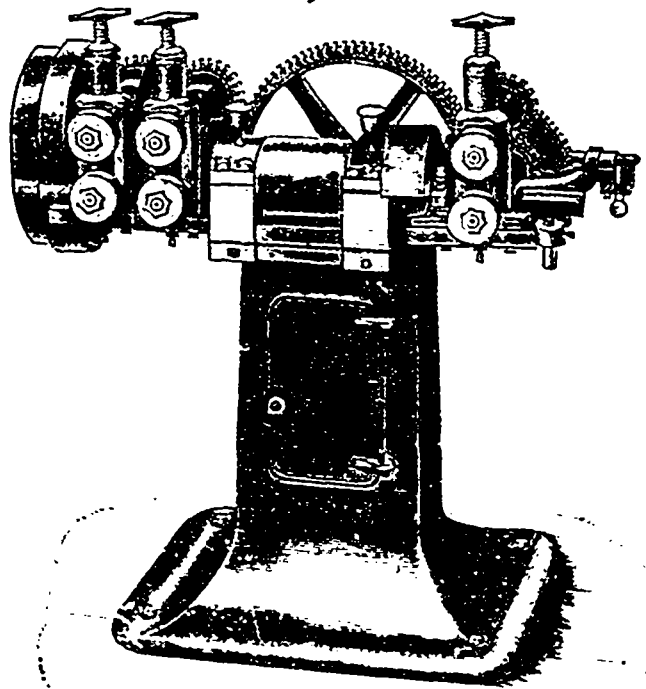
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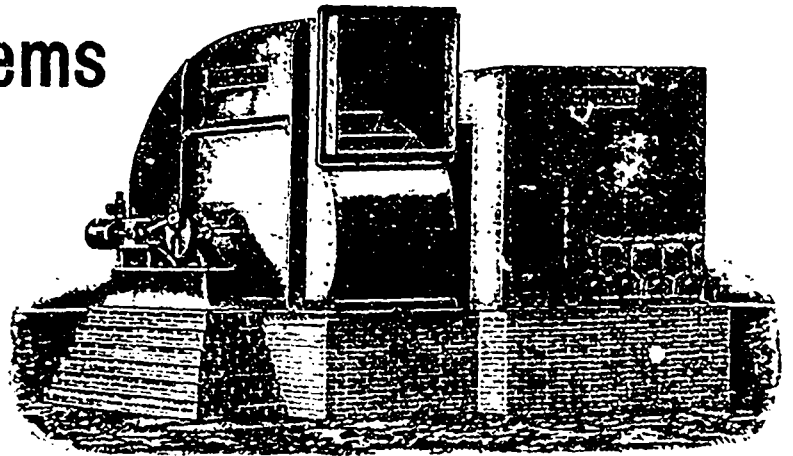
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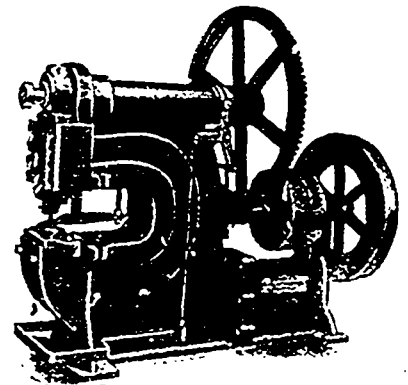
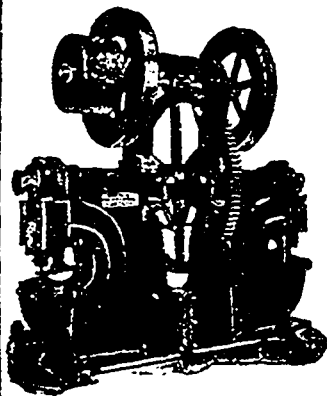
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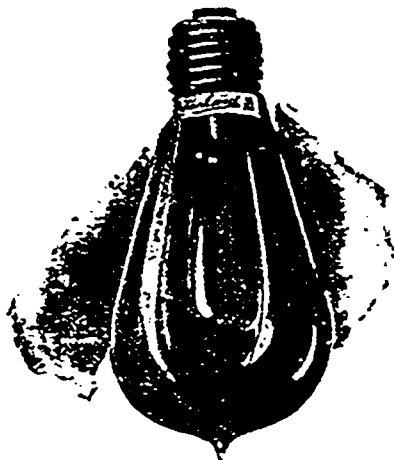
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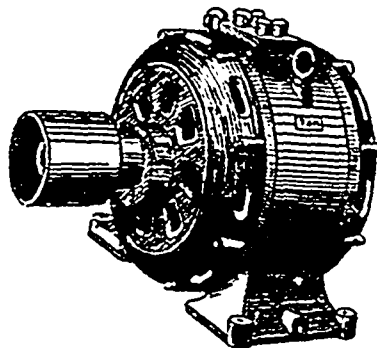
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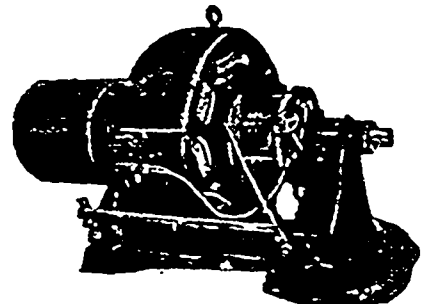
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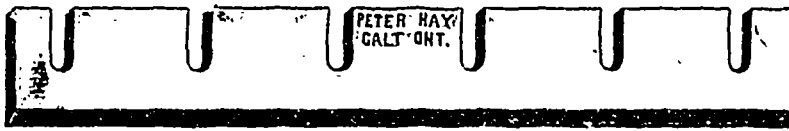
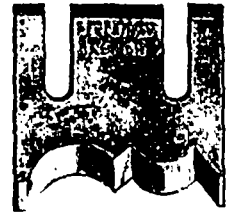


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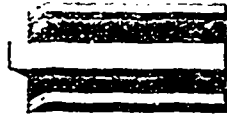
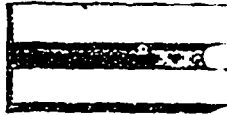


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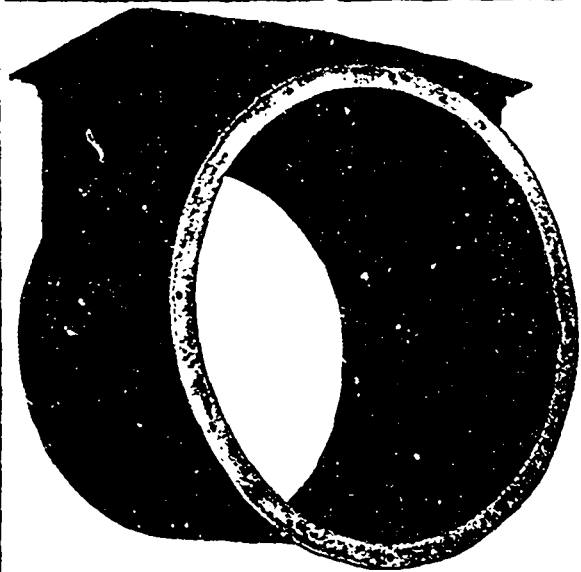
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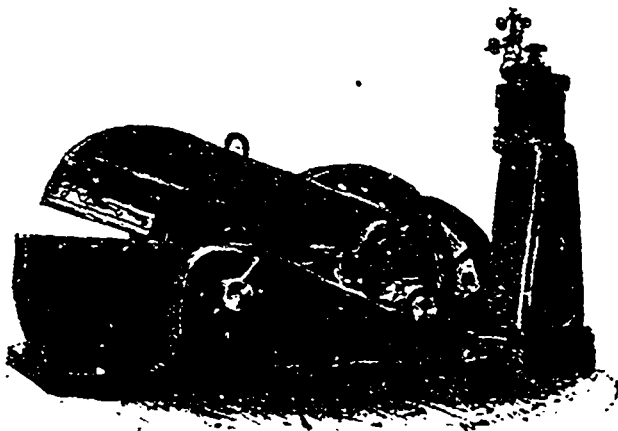
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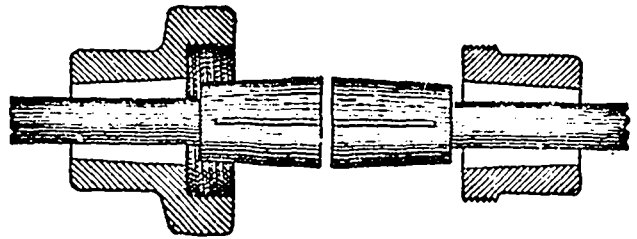
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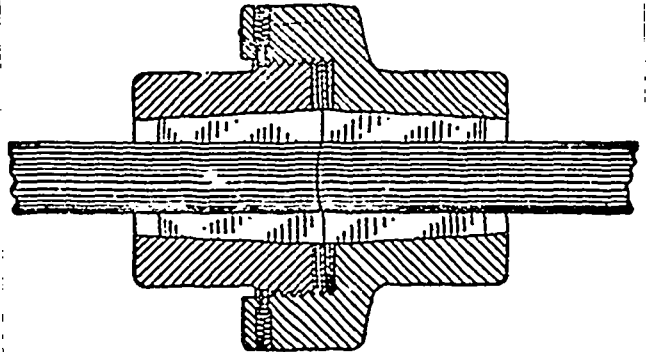
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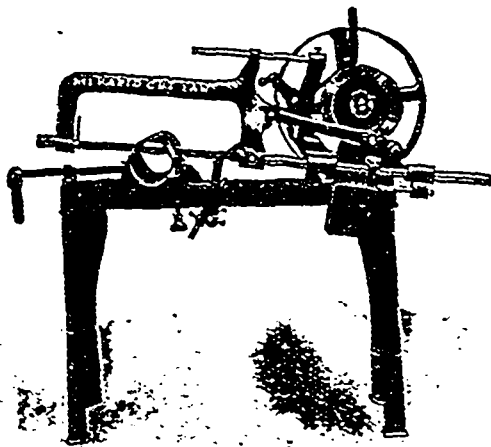


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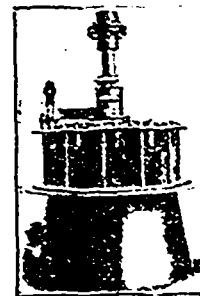
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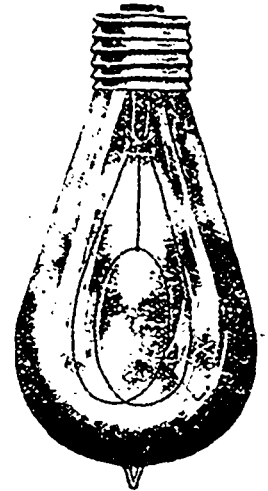
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McKinnon Building, Cor. Melinda and Jordan Sts., Toronto.

Cable address: "CANAMAN." Western Union Telegraphic Code used.

SUBSCRIPTIONS:

Canada and United States \$1.50 per year. All other Countries in Postal Union ten shillings sterling, including postage.

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THE CANADIAN MANUFACTURER

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WHEN THE TARIFF IS REVISED.

At the recent annual convention of the Canadian Manufacturers' Association, held in Montreal last month, Mr. George E. Drummond, the retiring president, addressing the convention regarding the tariff, said:

With respect to our present Customs tariff, the Canadian Manufacturers' Association occupy exactly the same position to-day as when we met at Halifax two years ago and adopted the following resolution, namely:

Resolved—That in the opinion of this Association the changed conditions which now obtain in Canada, demand the immediate and thorough revision of the tariff upon lines which will more effectually transfer to the workshops of the Dominion, the manufacture of many of the goods which we now import from other countries.

The report of the tariff committee of the Association, read at that meeting, expressed regret that another year had passed without bringing a general revision of the tariff. "The Association does not advocate the adoption of the United States tariff," the report states, "some lines of manufacture in Canada may require as much protection as the same lines receive in the United States—many may require less. What we believe to be necessary is a tariff framed primarily for Canadian interests, and also to build up an increased trade with other parts of the British Empire. Above all, however, it must enable Canadian producers to meet the competition of foreign labor on fair and equitable terms."

With all due deference to the wise men included in the Association, and in the Dominion Government also, it seems that they have never comprehended that a feasible and workable tariff policy might be adopted that would give full and adequate protection to all Canadian industries, and at the same time show a preference to British goods that so many desire to observe. We do not see why the Association should object to the adoption of some of the features of the United States tariff if by such adoption the best interests of Canada would be served; and it is certain that while embodying some features of the United States tariff into the Canadian, our revised

tariff could be made to encourage wider trade with Great Britain and other parts of the Empire.

It was upon the occasion of the call to the Dominion Parliament to assemble in February last, at which the Association hoped to see some tangible effort made towards revising the tariff, that THE CANADIAN MANUFACTURER suggested as follows:

1. The tariff should be of a dual character—a minimum tariff to apply to imports from commercially friendly countries, such as Great Britain—and a maximum tariff to apply to imports from commercially unfriendly countries, such as Germany.

2. The duty imposed upon imports should be (a) specific only and always where possible; or, (b) compound, i.e. both specific and ad valorem; to be ad valorem only when neither specific or compound is practicable.

3. Tariff rates, under all circumstances, should be sufficiently high to afford adequate protection to every Canadian manufacturing and industrial interest.

4. Every possible safeguard should be thrown around the administration of the tariff laws to prevent undervaluation and other frauds upon the Customs.

5. There should be no special preferential provisions in the tariff such as now exist, as such features would be included in the minimum tariff, and applicable not only to British imports but also imports from any other country which treats Canada with equal commercial favor.

Such tariffs would be automatic in their application; and it would be free to any country to decide under which its products would be admitted into Canada.

Specific duties would prevent importations of inferior goods of all descriptions, and also undervaluation. Compound duties would apply to textile fabrics, ready made clothing, etc., and would prevent or restrict imports of shoddy and inferior goods.

But first, last and always the salient feature of the Canadian tariff should be adequate protection to every Canadian industry.

That Sir Wilfrid Laurier, the Premier, appreciates the

importance of tariff revision is evident in what he said in Hamilton on October 11. In his speech he directed attention to the fact that in a country like Canada, in which conditions are always changing, it is impossible that the tariff be permanent—it was never intended to be permanent—but it was intended that there should be stability. "We all know" he said, "that the time is not far distant when there should be another general revision of the tariff, but if such a revision is undertaken, upon what lines shall it be? Mr. Fielding has declared what these lines should be. In the first place Mr. Fielding has declared there shall be no revision until there has been ample investigation—until there has been consideration given to every class of the community—to the producer and to the consumer. All classes of manufacturers will be heard. We are not going to follow the old groove that has been followed ever since the Dominion of Canada became a confederation up to the present moment. We have now only one line of duty which we apply to all countries alike, except to Great Britain, to which we give the preference. But we propose to add a new chapter. We propose to have a double class of duties—to have a minimum and a maximum tariff. The minimum tariff we will apply to such countries as will treat us fairly,—to such as will trade with us fairly; that is to countries that not only sell to us but buy from us. The maximum we propose to use against those countries which are selfish in their methods, which insist upon selling to us, but will not have elasticity or reciprocity of fair trade arrangement with us. Under such circumstances we believe we are following the consensus of opinion of all Canadians when we apply to others the same treatment as they apply to us. Upon this point I have given you a few words on the line of the policy we intend to follow when we revise the tariff."

Our American friends should take notice. They have provoked a reciprocity of tariffs. If Sir Wilfrid's views are carried out, as heretofore suggested by this journal, it will be for them to say whether their products will gain entrance into Canada under the maximum or the minimum clauses of the tariff.

THE LAW RELATING TO STRIKES BY WORKMEN.

What can workmen legally do to enforce their demands against their employers? An answer to this question says Mr. Edward Meek, a well known barrister of Toronto, involves a consideration of those provisions of our criminal law which prohibit individuals or combinations of men from doing things which will result in injury or loss to others.

In the first place it is a settled principle of the law, that where men combine "to do an illegal act," their conduct is punishable, and they are also liable to an action for damages, provided the illegal act causes injury or loss to others.

In the second place it is laid down as a general principle, that where men combine for the purpose of accomplishing a lawful purpose, "but resort to illegal means" for attaining their object, their acts render them liable to prosecution and punishment under the Criminal law, and may also be the subject of an action for damages.

The propositions are fundamental and permanent. They constitute the definition of "illegal conspiracy." No civilized community can allow individuals or combinations

of men to commit acts which are in themselves illegal, or to resort to "illegal means" for attaining legal objects.

But the Criminal Code says: "No prosecution shall be maintainable against any person for conspiracy in refusing to work with, or for, any employer or workman, or for doing any act or causing any act to be done, for the purpose of a trade combination, unless such act is an offence punishable by statute. It further explains the meaning of "Trade Combination," and says: the expression "trade combination" means any combination between masters or workmen or other persons, for regulating or altering the relations between any persons being masters or workmen, or for regulating the conduct of any master or workman in or in respect of his business or employment, or contract of employment or service; and the expression "Act" includes any default, breach or omission. The meaning of this concise language is, that any combination between masters or workmen or other persons, for the purpose of accomplishing a legal object, such as the increase or decrease of wages, or the extension or limitation of the hours of labor, shall not be punishable as a criminal offence. Section 520 as amended in 1900, defines what conspiracies or combinations shall be criminal. It says: "It shall be a criminal offence for any one to conspire or combine, or agree or arrange with any other person to unduly limit the facilities for transporting, producing, manufacturing, supplying, storing, or dealing in, any article or commodity which may be a subject of trade or commerce: or to restrain or injure trade or commerce in relation to any such article or commodity; or to unduly prevent, limit or lessen the manufacture or production of any such article or commodity; or to unreasonably enhance the price thereof; or to unduly prevent or lessen competition in the production, manufacture, purchase, barter, sale, transportation, or supply of any such article or commodity; or in the price of insurance upon person or property." But the section contains this proviso in favor of workmen or employes: "Nothing in this section shall be construed to apply to combinations of workmen or employes for their own reasonable protection." Until each of these provisions has been adjudicated upon by a court of competent jurisdiction, it is impossible to say how far-reaching or limited each of them may be. It is left very largely to the court before which an action may be tried, to determine which acts amount to evidence of an illegal conspiracy, or combination. These are the only provisions of the Criminal Code in the Dominion of Canada which apply to conspiracies or combinations of workmen, except those which relate to a wilful breach of contract "endangering the lives or property of others" and those provisions which prohibit "intimidation."

If a person wilfully breaks any contract made by him, knowing that the probable consequences of his so doing, either alone or in combination with others, "will endanger human life or cause any serious bodily injury, or may expose valuable property to destruction or serious injury," it is a criminal offence, and punishable by fine or imprisonment, or both.

If anyone, either alone or in combination with others, without lawful authority uses violence to, or "intimidates" any other person, to compel him to abstain from doing anything which he has a lawful right to do, or to do anything which he has a lawful right to abstain from doing, and uses violence or threats, or persistently follows such person from place to place, or hides any tools, clothes or property owned or used by such person; or with one or more other persons, follows such person in a disorderly manner, or besets or watches the house or other place where such other person resides or works or carries on business, it is a criminal offence punishable by fine or imprisonment or both. These are some of the provisions of the Canadian Criminal Code applicable to the methods adopted or prosecuted by trades unions or combinations of workmen to effect their objects or purposes. And

person, union, or combination violating these provisions may be punished criminally, and may also be liable to a civil action for damages.

But there are cases which do not come within the letter or spirit of the criminal law, in which the courts have held that the conduct of men belonging to trade combinations or unions, was illegal, though strictly speaking, not criminal. In such cases the courts have allowed the parties injured, to maintain an action for "damages" against the person or persons who causes them injury or loss. There are many other cases in which the courts have at the instance of persons who had been threatened injury or loss, granted an "injunction" restraining those connected with trades unions and labor combinations from pursuing the methods adopted by them.

Actions for damages are often fruitless because the defendant may be worthless, or may have no means or property which can be taken hold of to satisfy the damages awarded. Where, however, an injunction is obtained, the persons affected by the order are restrained from doing the illegal acts complained of. If, in defiance of the injunction, they persist in their conduct, the court can arrest and imprison them indefinitely, and can thus restrain them from doing the illegal acts. Formerly those injured resorted to the Criminal law, but in recent years, complainants, rather than attempt the uncertain results of a criminal prosecution, have applied to the courts for an injunction, which has been found to be more effective and beneficial than either a criminal prosecution or an action for damages.

There may possibly be an actionable conspiracy to do acts not in themselves actionable; but, in order to give a cause of action the combination to do a "lawful act" must be entered into with a "malicious" intention of damaging the complainant. One powerful engine by which the Trade Unions try to make strikes successful is "boycotting" or "picketing." By our Criminal Code, these and other acts of intimidation are made criminal offences, but it has been found more satisfactory to put an end to them by "injunction." In *Lyons v. Wilkins*—an English case decided about four years ago—an injunction was granted restraining the defendants, who were officers of a trades union, from watching or besetting the plaintiff's works, for the purpose of persuading or otherwise preventing other persons from working for them. In *Krug Furniture Co. v. Berlin Union*—an Ontario case recently decided—the learned judge said: "So long as the workmen resorted to lawful means only to accomplish a lawful object, they were within their right, but any unlawful object, or unlawful means to obtain a lawful object, should be met with prompt prevention and punishment." In *Read v. Friendly Society*—an English case decided in 1902—the court held that the plaintiff had a good cause of action, and said: "Persuasion by an individual for the purpose of depriving another person of the benefit of a contract, if it is effectual in bringing about a breach of the contract to the damage of that person, gives a good cause of action; and a strong belief on the part of the persuader that he is acting in his own interests does not seem to me to improve his position in any respect." Still less can it do so when he does not confine himself to persuasion, but "joins with others to enforce their common interests at the plaintiff's expense by coercion." A "breach of contract" may not be a criminal offence or may not be a punishable Tort, but it is none the less an illegal act, and it is difficult to see why the procuring of it should not be actionable.

FREE COAL.

How the New Englander works for what he wants until he gets it is proverbial. Just now there is the free admission of Canadian coal, among other things, agitating the mind and finding expression in print. In 1902 our

total exports of anthracite coal were 1,570,490 tons, of which 1,502,372 tons were shipped into Canada. The total exports in 1903 were 1,388,653 tons, of which 1,369,376 tons were sent to Canada. Our total exports of bituminous coal in 1902 were 5,400,694 tons, of which 3,335,820 tons went into Canada (3,250,000 tons all-rail over the border; between Ohio and Vermont). In 1903 our total exports of bituminous coal were 5,210,000 tons, of which 3,692,000 tons went into Canada, most of it by the northern border.

As respects the coal supply the New England States are in an exactly analogous position to Central Canada. Neither possesses coal fields. Both are dependent upon an outside supply; both pay the same import duty. Toronto, the leading city in Ontario, is 1,112 miles from Sydney, C.B., by water. It is also 118 miles from Buffalo, which brings the Pennsylvania coal region within 300 miles of that city, consequently the proximity of the mines of Ohio, Pennsylvania and West Virginia to not only Toronto, but the whole territory from Montreal to Winnipeg, a distance of 1,500 miles, compels them to purchase their coal from these States, although the price is enhanced by a duty of 53 cents per net ton.

One finds in Central Canada the same talk of free coal that exists in New England. Nova Scotia coal gets no further west, practically, than Montreal, so that the duty is not a protection, but just a tax on Ontario manufacturers. The soft coal consumption of Ontario, as given by the Dominion Bureau of Statistics, was 3,525,425 tons in 1903. This coal costs at the mine about 80 cents to \$1 a ton. Freight rates by rail average about five-tenths of a cent per ton per mile. This makes the cost of Pittsburgh coal in Cleveland \$2, in Buffalo \$2.25. Crossing the border into Ontario, one finds the same situation; that manufacturing interests are affected by the distance from the coal. As Pittsburgh gets its coal at a freight cost of 25 cents, its advantages over Cleveland and Buffalo are immense, and put it in the front rank of manufacturing cities. Assuming that coal to Central Canada goes via Suspension Bridge, the cost and charges at Toronto would be \$2.90, plus the duty, and Nova Scotia coal could not get there at any such figure; hence the cry in that part of Canada for free coal. The New England manufacturer cannot get a supply of Nova Scotia at present on as favorable terms as he can get Pennsylvania coal, but when the demand for the latter increases above what has latterly been the case, owing to over-supply, there would be a chance for Nova Scotia coal to get in, if there were no duty levied thereon.—The Coal Trade Journal.

EDITORIAL NOTES.

Thursday, November 17 has been appointed as Thanksgiving Day in Canada.

When the Ontario Legislature is in session, a part of the duty of Mr. Speaker is to read prayers each day at the opening of the sittings, included in which is the following:

"Most Gracious God, we humbly beseech Thee, as for

the United Kingdom of Great Britain and Ireland and his Majesty's dominions in general, so especially for this Province, and herein more particularly for the Lieutenant-Governor and the House of Assembly, in their legislative capacity at this time assembled, that Thou wouldst be pleased to direct and prosper all their consultations, to the advancement of Thy glory, the safety, honor and welfare of our sovereign and his Province of Ontario, that all things may be so ordered and settled by their endeavors, upon the best and surest foundations, that peace and happiness, truth and justice, religion and piety, may be established among us for all generations."

Prayers are usually said in all legislative assemblies; and the spirit of them should be observed by the people as well as the legislators, at all times. In these eventful times the guidance of the Almighty should be evoked with all fervor and humility.

The contract for the Pacific Ocean steamship service between Vancouver, B.C. and Mexico has been awarded to Mr. Reid of Glasgow, who will receive a subsidy of \$100,000, to which the Canadian and Mexican Governments contribute in equal proportions. The steamships will run monthly between Vancouver and the Mexican ports of Mazatlan, San Blas, Manzanillo, Acapulco, Puerto Angel, Salma Cruz, Tonalá and San Beneto. The service is for five years. It is hoped to inaugurate an Atlantic service to Mexico also. The Dominion Government are willing to vote \$50,000 for the purpose, but the authorities at Mexico have not yet signified their willingness to co-operate.

The report that the United States Steel Corporation is planning the erection of a Canadian steel plant appears to have more basis than many of the publications relating to its movements and policy, says the Iron Trade Review. It is known that the Canadian proposition was carefully investigated eighteen months ago, in view of the manifest advantages in supplying the Canadian trade from a well located plant on the other side of the line. The recent changes in Canadian tariff regulations, plainly aimed at the manufacturers of the United States, have naturally revived interest in the project. No doubt account will be taken in considering the advisability of this step, of the advantage such a plant will afford for the promotion of the export trade with Great Britain and in time with Australia. Whatever comes of Mr. Chamberlain's radical proposals, there is little doubt of the enactment eventually by Great Britain of tariff laws that will bear against the United States and Germany, and favor the products of Canada and the Colonies. An attractive feature of a Canadian plant of the Steel Corporation, which it may be assumed would be so located as to receive Lake Superior ores and Connellsville coal directly from vessels on its docks, would be the possibility of export shipments in unbroken cargoes to British and Continental ports.

It has frequently been argued in these pages that a tariff preference being shown to Great Britain, it would be but fair that Great Britain should show a tariff pref-

erence to Canada. For several years Canada has extended preferential treatment to British goods imported into this country, and in other ways shown her desire to cultivate the closest possible trade relationship with the Mother Country; but these advances have not been recognized nor encouraged by those who have been benefitted by them. Mr. Chamberlain is canvassing the Kingdom in an endeavor to educate the people up to the idea of bringing about some sort of preferential trade within the Empire, but it is a chimera that may never assume a more definite form than at present.

Dealing with reciprocity from a railway standpoint. The Railway World of Philadelphia says:—"Aside from the personality of the candidates, the leading issue in the Presidential campaign is rapidly centering around tariff revision. The sentiment for reciprocity within the Republican ranks has developed surprising strength, especially in Massachusetts, where it may have unexpected consequences. In the west the farmers are still predominantly Republican in sentiment, but a large number of them are fully convinced of the injustice of some of the prices which they have to pay and are certain to impress these convictions upon their representatives. Even in the middle States, the ancient stronghold of protection, a sentiment favoring more liberal trade relations is already discernible. No matter which party is successful in the November election, tariff revision is probable in the near future."

During the year ending June 30, 1904, \$880,549 was paid out in bounties by the Canadian Government on pig iron and steel ingots. This is \$521,255 less than during the preceding year. During the year ending June 30, 1903, bounties on pig iron, puddled iron bars and steel ingots, to the extent of \$1,401,804, were divided as follows: Algoma Steel Co., Limited, \$48,297; Canada Iron Furnace Co., \$87,472; Deseronto Iron Co., \$18,675; Dominion Iron & Steel Co., Limited, \$960,979; Hamilton Steel & Iron Co., Limited, \$148,275; John McDougall & Co., Drummondville, \$5,243; and Nova Scotia Steel & Coal Co., Limited, \$132,860.

The Canadian commercial agent for West Australia, reporting to the Department of Trade and Commerce from Melbourne, says: "Record orders are being forwarded this year from Australia to Canada for agricultural implements and machinery. The principal Canadian manufacturers enjoy an excellent representation here, to which is attributable the splendid and widely increasing business done, while a number of inquiries are going forward to Canada for lines of goods new to this country."

The Halifax Maritime Merchant, speaking of the "dumping clause" of the new Canadian tariff regulation, says:

Last week the customs officials at St. John applied it to an importation of axes which had been ordered since June 8. A consignment of scythes was also subjected to the added duty. As an illustration of how

the clause worked in the case of the axes, let it be supposed the consignment consisted of 6 dozen axes, costing \$4.50 a dozen, or \$27 for the lot. The regular price was \$33, the duty on that being \$8.25. The difference between the two prices was \$6, which is more than 15 per cent.; therefore \$4.13, half of the regular duty, was added to the \$8.25, making the total duty as actually assessed \$12.38. The axes therefore cost \$39.38, which was prohibitive. It is understood that the clause will also be applied to wire nails, which are being cut 20 cents a keg in the United States for export trade.

The new Customs regulations affecting invoices of goods coming into Canada, which were published in full in a recent issue of this journal, went into effect October 1. As therein stated, the Customs authorities now require duplicate invoices, and on each invoice must be a column in which is to be entered the fair selling price in the country from which the articles are imported. This is part of the anti-dumping regulations. On each invoice there must be printed or written a certificate of the value of the goods contained in the consignment. The new form of certificate must be signed by the exporter or by a responsible agent, and is to the effect that the invoice is correct as to the price of goods, that the value placed on them is the fair market value if they were sold in like quantity or condition for home consumption; that no different invoice will be furnished to anyone, and that there is no arrangement allowing the purchaser any discount or rebate, or any compensation whatsoever. On all invoices of goods not entered under the British preferential tariff, a special certificate has to be sworn, stating that none of the articles is the product or manufacture of Germany. A certificate is required on invoices of goods of British manufacture, giving details as to the countries from which the materials included in the consignment come, and in the invoice of goods sold by an exporter prior to their shipment to Canada, not only must the market value of the goods for home consumption be given, but also the selling price to the purchaser in Canada.

The key-note of the impressions of Canada expressed by the representatives of the Institution of Civil Engineers of Great Britain who were in Toronto last week, is a keen appreciation of the wonderful possibilities of our water powers and waterways for industrial development. Considerable time has been spent by the visitors, in Quebec, Montreal, and Ottawa, since their arrival in this country, and much consultation has been had with Canadian engineers, and as one of the visitors remarked "We are simply astounded at the vast possibilities offered by your country for the development of electricity through your illimitable water-powers. To us it appears overwhelming, the wonderful opportunities untouched, and the great amount of energy going literally to waste." Sir William White, president of the Institute, speaking of the unrivalled water powers of Ontario, said:

"We have been impressed not only by your public buildings and public works, but have been brought face to face with what Canada possesses in unrivalled water

powers and inland water communication. This province alone has a navigable lake frontage of 1,700 miles. It means that the question of cheap transportation can be easily solved. The Trent Valley Canal now taking shape is evidence of your appreciation of these advantages. We appreciate the advantages of Canada as one of the individual States making up the British Empire. We understand what an asset you have in your water powers those great stores of energy yet undeveloped. One initiative in development will have to be made by Canada herself. She will have to show the way to the Empire, and in doing so Canadian engineers will add another to their many triumphs in the engineering world."

Moses, speaking to the Children of Israel, commanded them, in the name of the Almighty, to "go forward" and enjoy the fruits of the land He had given them. In like manner George E. Drummond, the retiring president of the Canadian Manufacturers' Association delivered a message to Canadians a few days ago. Mr. Drummond said:

"If I have a message to deliver it is to stand together for the preservation and advancement of Canadian industries, for the preservation of the base from which your capital and labor must work—the home market. Let Canadians be known for their fair dealing and business integrity the world over. Take pride in your national products. Let administrative ability and technical knowledge combine to produce by the most modern methods, and with up-to-date equipment, goods that will set the standard of excellence everywhere.

"In the building up of our country let us be broad and fair-minded in all our measures. Let us see to it that we place no embargo on brains, brawn, or capital, because all these forces are necessary in the development of this great country.

"Make Canada attractive as a home to desirable people from all lands, and protect the product of their labor when they come to us.

"Stand for permanent unity between Canada and the empire to which we belong, and remember that in this unity lies our very existence as a free and powerful people."

The statistics for the fiscal year 1904 show that while the export of wood pulp from Canada decreased, the export of the raw material (pulp-wood), all of which goes to the United States, increased. The value of total export of pulp wood in 1904 was \$1,758,049, an increase over 1903 of \$229,489, or 4½ per cent. The total export of pulp decreased 23 per cent., the value being \$2,409,074, against \$3,150,943 during the previous year. The falling off was chiefly in the export to Great Britain, the value of which decreased 51 per cent., from \$1,129,173 to \$548,720, while the value of exports to other countries fell from \$226,002 to \$52,912. The value of Canada's total exports of paper, however, rose from \$849,519 to \$1,097,212, an increase of \$247,693, or 29 per cent. of the total value of the exports during 1903. Great Britain took \$447,672 worth, the United States \$163,000 worth, and other countries \$486,531 worth.

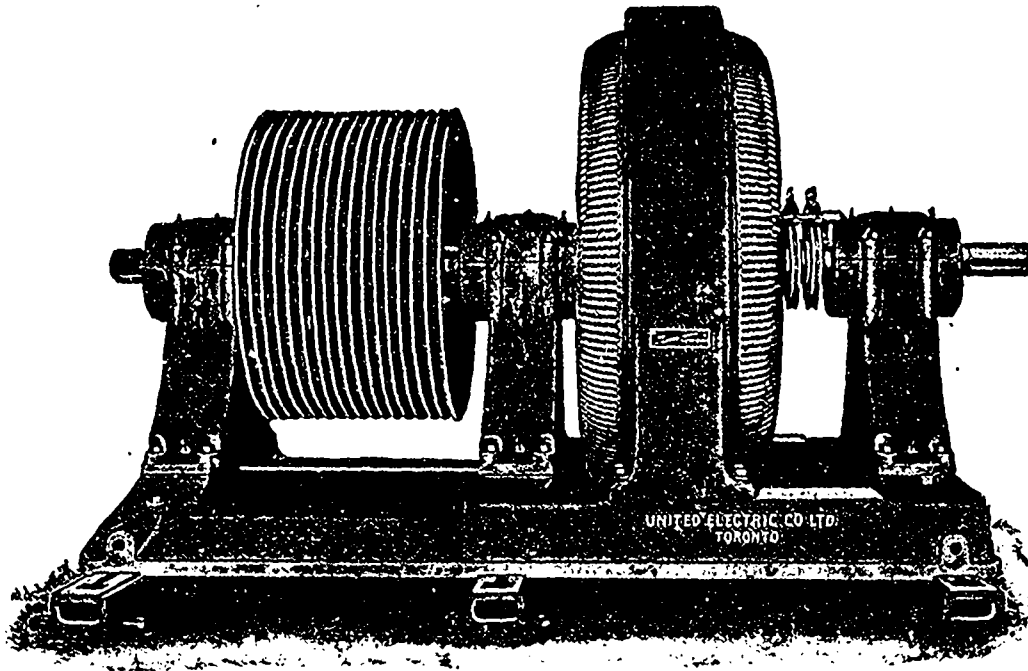
A NEW GENERATOR.

The new alternating current generator herewith illustrated has recently been placed on the market by the United Electric Co., Toronto, and is designed to meet the many demands for the revolving field type of generator. This generator is a distinct advance

back into the other pole of rotor alternately. This construction gives absolute inherent regulation, a cool generator and greater economy of power. These generators are wound for single, two or three phase transmission and standard alternations and in belted, engine type or water wheel type.

EXHIBIT OF THE BRISTOL CO. AT THE ST. LOUIS EXPOSITION.

The display of Recording Instruments for pressure, temperature and electricity made by the Bristol Co., Waterbury, Conn., is located in the Electricity Building. The accompanying illustration shows the ap-



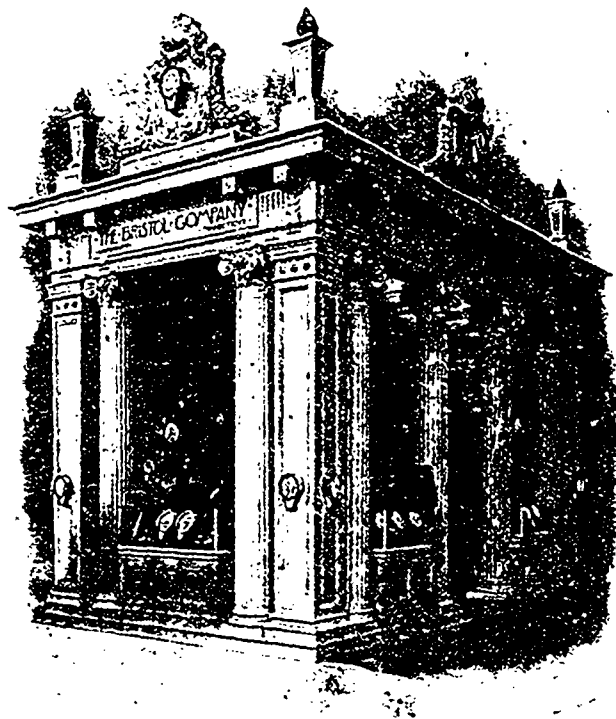
REVOLVING FIELD A.C. GENERATOR.

in this line of electrical power machinery possessing new and entirely original features.

The motor consists of a solid cast hub keyed to the shaft. This hub, together with the laminated steel pole tips and flanges, forms with the coils, the magnetizing and inductive circuits. The function of the rotor is (1st) to provide the magnetic field, and (2nd) to vary the position of the magnetic flux relative to the armature coils. The special feature is that only two energizing coils are used regardless of the number of poles, whereas all other types use one coil per pole. The stationary armature consists of annular steel laminations secured to the fixed frame and furnished with inwardly projecting teeth and support the armature coils. The armature lying external, as it does, to the rotor, gives room for ample cross section of conductive wire, without infringing on the space necessary for insulation. The coils themselves are thoroughly insulated in the process of construction. Thus the insulation between armature windings and frame is of the highest quality, and being upon the stationary portion of the machine, is not exposed to the slow disintegration and chafing which deteriorates some varieties of insulation upon revolving armatures. Ample carrying capacity is provided in all parts to insure a cool machine for ordinary overloads. Within the annular spaces formed by the rotor, periphery and poles, concentric with the shaft, are the two large coils, located one on each side of the rotor, supplying the excitation necessary for the machine. The magnetic lines generated by the coils flow through the laminated tips of one pole across the air-gap into the laminated armature, and

The new generator is the invention of Mr. W. A. Johnson, general manager of the United Electric Co., Toronto, who owns the patents for Canada and foreign countries.

pearance of the booth which is 22 feet long by 12 feet wide. The booth contains a large variety of recording instruments for pressure, temperature and electricity. These instru-



BRISTOL CO.'S EXHIBIT AT ST. LOUIS EXPOSITION.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

ments record continuously with ink upon graduated revolving charts all changes that occur in pressure, temperature or electricity, so that a record of a period of 24 hours or more may be observed at a glance. Many of these instruments are in actual operation, and may be inspected by visitors to show the manner of construction and scientific principles upon which their operation depends and the extreme sensitiveness and accuracy that it is possible to obtain in instruments of this character without rendering them too delicate for commercial application. Recording pressure gauges are shown for ranges from full vacuum to 10,000 pounds per square inch, recording thermometers and pyrometers for ranges from 60° below zero to 1,200° F. The recording thermometers are made in many varieties of form to make them applicable to all industrial requirements, especially where it is desired to record temperatures at a distance from the source of heat. Recording volt, ampere and watt meters for both alternating and direct current are shown, including a great variety of ranges suited to commercial demands for different voltages and currents in electric light, power and railway plants.

Recording water level gauges are shown in operation and also a new instrument designated as a thermometer-thermostat. This last instrument is so constructed that it may be used to give an alarm or set in operation temperature regulating apparatus at any predetermined point of temperature.

A full line of sizes of Bristol's patented steel belt lacing is also exhibited and includes styles and sizes of lacing for all varieties and thicknesses of belting.

FLYWHEEL INSURANCE.

Flywheel insurance is steadily growing in popularity, for the reason that repeated and serious accidents show the necessity of protection against such occurrences, while as a general thing these explosions of flywheels are due to causes against which there are few safeguards. If a flywheel went to pieces because of defects in its construction a manufacturer could make sure that he had a first-class wheel and would feel reasonably safe, but in the great majority of cases the wheel bursts because of an accidental increase in speed due to some derangement of the mechanism of the engine. A slight derangement of the governor, the loosening of a screw or nut, or the breaking or slipping of the governor belt, may allow the engine to race, under which conditions the strongest and best flywheel is liable to burst. This accident almost inevitably wrecks a costly engine, damages other machinery and often destroys the power house and causes loss of life. All this is covered by flywheel insurance, and in addition there is a regular inspection of the engines and wheels that is of great value.

The coke oven plant to be erected at Sault Ste. Marie by the Consolidated Lake Superior Corporation will have a capacity of about four hundred tons daily. Some 350,000 tons of coke will be handled annually and about 300 men will be employed. Construction work will be started in the spring. All the coke will be taken by the Lake Superior Corporation for use in the blast furnaces on the Canadian side of the river.

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 on 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, alkalies, 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 ratepayers of Hespeler, Ont., have voted favorably on a by-law granting a loan of \$20,000, to Messrs. Clark & Demill, Galt, Ont., to establish a plant for the manufacture of wood working machinery there.

The Barclay Hodgkins Lumber Co., Toronto, have been incorporated with a capital of \$50,000, to manufacture lumber, etc. The provisional directors include C. A. Barclay, Pickering, Ont., O. Hodgkins and H. Hodgkins, Wellandport, Ont.

The International Mercantile Agency of Canada, Limited, Toronto, have acquired the business of the Canadian International Mercantile Agency and the Sprague's Mercantile Agency of Ontario with a capital of \$250,000.

The Senator Mill Mfg. Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture machinery for the reduction of rock, ore, cement, etc. The provisional directors include J. K. Griffin, J. Ridley and Wm. St. Clair, Galt, Ont.

The Chronicle Printing Co., Port Arthur, Ont., have been incorporated with a capital of \$40,000, to acquire the business of F. B. Allen and to carry on a printing and book binding business. The provisional directors include Geo. Hodder, J. T. Emmerson and F. B. Allen, Port Arthur.

The Canada Process Co., Toronto, have been incorporated with a capital of \$50,000, to manufacture metals, minerals, compositions, etc. The provisional directors include G. I. Sherlock, J. M. Neil and G. H. Campbell, Toronto.

The Anyun Fuse & Electrical Co., Hamilton, Ont., have been incorporated with a capital of \$40,000, to manufacture electrical and mechanical supplies, etc. The provisional directors include D. M. Cameron, J. J. Markham and Wm. Shaw, Hamilton.

Owing to recent storms the power house at Toronto Island, was damaged and will have to be rebuilt and new machinery installed.

The Dominion Chair & Cabinet Co. have changed their name to the Clarke Mfg. Co.

The Huronian Co., an American concern recently organized for the purpose of constructing and operating an extensive power transmission system between Turbine, Ont., and the Copper Cliff plants of the Canadian Copper Co., have awarded an important contract for generating equipment, to the

Crocker-Wheeler Co., Ampere, N.J., and New York City, which calls for two 2,000 k.w. alternating current generators of Brown-Bouvier type. These machines will be direct connected to 3,500 h.p. water turbines, which have not yet been contracted for. Power will be derived from High Falls, on the Spanish River, which are capable of developing about 15,000 h.p. The transmission line will be about 30 miles long. The Canadian Copper Co.'s electric plant is at present operated by steam, which power will be held in reserve as soon as the new system is in operation. Contracts are also about to be placed for a number of big motors, including one of 700 h.p., for driving compressors, etc. Electricity generated at the Huronian plant will be utilized for the purpose of operating the mines and smelters at Copper Cliff. The consulting engineers of the Huronian Co. are Ross & Holgate, Montreal. The contracts for equipment, etc., are being placed by David T. Trainor, the purchasing agent of the International Nickel Co., New York City.

The Chatham Mfg. Co., Chatham, Ont., have received an order for 2,000 wagons from the International Harvester Co., Chicago, Ill., at a cost of \$200,000.

The McClary Mfg. Co., London, Ont., manufacturers of stoves, etc., will close their shops at Hamilton, Ont.

The Brockville Lumber Co., Brockville, Ont., have been incorporated with a capital of \$75,000 to manufacture lumber, hardware, cement, etc. The provisional directors include V. R. Marshall, W. H. Constock, Brockville, and E. W. Rathbun, Deseronto, Ont.

The Corundum Refiners, Limited, who have a large corundum mine in Renfrew County, Ont., have opened up a village to be known as Jewellville. The opening of the corundum mines has caused a large influx of people into the district, and contracts have been let for the erection of a large number of dwellings for the corundum company's workmen. The construction of the different mills are in progress. Mr. J. H. Jewell, of Toronto, will be in general charge of the development work at the mines.

As a result of goods supplied by the Ontario Wind Engine & Pump Co., Toronto, to the Imperial government the last seven or eight years this firm received this week an enquiry for their famous Canadian airmotor from the Imperial government in one of the Crown Co.

onies of West Africa. The universal satisfaction this type of windmill has given its patrons has caused it to be well known all over the world. Canadian manufacturers should endeavor to turn out goods that will prove an advertisement not only to the manufacturers but also to the country at large.

The Dominion Brass Works, Ltd., Port Colborne, Ont., have opened a branch office at 71 Adelaide street west, Toronto, where a full stock of their manufactures, including, in addition to the "Huxley" valve, a complete line of plumbers' brass goods, will be kept in stock. The Toronto office is in charge of J. G. Stewart, a member of the company.

The Brantford Felt & Rubber Co., Brantford, Ont., recently organized, will establish a factory for the manufacture of rubber boots in that city.

The Hamilton Biscuit & Confectionery Co.'s premises at Hamilton, Ont., were damaged by fire October 11. Loss about \$6,000.

The J. I. Case Mfg. Co., Racine, Wis., manufacturers of threshing machinery, etc., will establish a branch works at Fort William, Ont. They will give employment to about 400 men.

The Victor Varnish Co., Toronto, have acquired the business of the Robertso-Varnish Works and the business carried on by Messrs. Doyle and McWaters.

The Dominion Government have awarded another contract for 10,000 tons of steel rails to the Consolidated Lake Superior Co. at Sault Ste. Marie, Ont. This makes 20,000 tons which the Soo company are to supply to the Intercolonial. They are to be delivered at Montreal before the close of the present season.

The second Canadian ice-breaker was launched recently at Paisley, Scotland, by Messrs. Fleming & Ferguson. This is the Montcalm, now on the way to Canada from the yards of the same builders. The Montcalm is 250 feet in length, and designed especially to attempt the breaking of the Cap Rouge ice bridge. She will reach Canada not later than December 1. In summer she will be used as a lighthouse and buoy tender.

A by-law will be submitted to the ratepayers of Brantford, Ont., to raise \$60,000, for the erection of a new city hall.

The Milner Petrolca Wagon Co., Petrolca, Ont., have changed their name to the Petrolca Wagon Co., Limited.

Constructions, Limited, Toronto, have changed their name to the Port Credit Brick Co., Limited.

The Canadian Lead Co., Toronto, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and smelting business. The provisional directors include W. H. Eccles, H. A. Bonter and J. H. Vamplew, Toronto.

The Caste Stone & Supply Co., Hamilton, Ont., have been incorporated with a capital of \$100,000, to manufacture cement, building material, builders' supplies, etc. The provisional directors include M. A. Pigott, J. H. Tilden and A. Zimmerman, Hamilton.

The Lake Shore Natural Gas Co., Fort Erie, Ont., have been incorporated with a capital of \$5,000, to produce natural gas and

electricity for light, heat and power purposes. The provisional directors include J. F. Foster, Buffalo, N.Y., H. W. Wendt and G. A. Jackson, Bertie, Ont.

The Central Ontario Power Co., Peterboro, Ont., will deliver some six thousand electric horse power to the towns of Bowmanville, Port Hope, Cobourg and Peterboro, from Burleigh Falls, which is owned by the company, and from Buckhorn Falls. Bowmanville manufacturers have assured in writing nearly fifteen thousand dollars revenue, and the company's rates will cut their steam power bills down by from 30 to 50 per cent. Property values should now boom in Bowmanville. Rents have doubled in Peterboro since they got cheap electric power. Mr. Culverwell's company has this week a \$25 whole sheet advertisement in THE CANADIAN MANUFACTURER, booming Port Hope, Cobourg, and Bowmanville as manufacturing centres, speaking of their fine harbors and offering cheap electric powers. The company have already secured some fifty thousand dollars revenue from these towns for electric light and power. —Bowmanville Ont., News.

The Canadian Klondyke Mining Co., Windsor, Ont., have been incorporated with a capital of \$750,000, to carry on a mining, milling and smelting business. The provisional directors include M. J. Murphy, J. Dwyer and F. T. Moran, Detroit, Mich.

Commercial Publishers, Limited, Toronto, have been incorporated with a capital of \$200,000, to carry on a printing and publishing business. The provisional directors include C. B. Murray, A. W. Holmsted, and Jas. Milne, Toronto.

The Department of Railways and Canals, Ottawa, are inviting tenders for the deepening and widening of the channel east of the Vidal shoal of the upper channel of the Sault Ste. Marie Canal, Ont., also tenders for the foundations for the proposed elevator to be erected at Port Colborne, Ont., and tenders for lighting by electricity the Carillon and Grenville canals.

The General Illuminating Co., Ottawa, have been incorporated with a capital of \$50,000, to manufacture and produce gas and electricity for light, heat and power purposes, etc. The provisional directors include E. H. Bronson, W. G. Bronson and L. Crannell, Ottawa.

The New York-Lake Erie Oil & Gas Co., Windsor, Ont., have been incorporated with a capital of \$1,000,000, to produce petroleum oil, natural gas, etc. The provisional directors include J. W. Lovell, Pelee, Ont., A. H. Clarke, and A. R. Bartlet, Windsor, Ont.

The Imperial Hardware Mfg. Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture hardware, and to carry on a general foundry and metal working business. The provisional directors include S. Fader, H. H. Earl and E. J. H. Pauley, Toronto.

The National Cultivator Co., Windsor, Ont., have been incorporated with a capital of \$100,000, to manufacture implements, etc. The provisional directors include A. H. Clarke, P. A. Dewar and F. Hutton, Windsor.

The Brantford Felt & Rubber Co., Brantford, Ont., have been incorporated with a capital of \$100,000, to manufacture rubber, gutta-percha and leather goods, etc. The

provisional directors include J. F. Martin, J. P. Bell and F. W. Frank, Brantford.

The D. W. Thomson Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture caskets, coffins, hearses, etc. The provisional directors include P. J. Smyth, J. Dechert, and P. Endress, Toronto.

The Niagara Quarry Co., Orillia, Ont., have been incorporated with a capital of \$40,000, to manufacture stone, cement, etc. The provisional directors include J. B. Tudhope, W. H. Tudhope and Wm. Thomson, Orillia.

An American Syndicate are negotiating with the town of Rat Portage, Ont., for the establishment of a match factory there. For further information apply to Mr. Wm. Robertson, Board of Trade, Rat Portage.

The Battle Creek Health Food Co.'s factory at London, Ont., was destroyed by fire October 15. Loss about \$7,000.

The Department of Public Works, Ottawa, are inviting tenders for the construction of armouries at Woodstock, Ont., and Stratford, Ont.

A new market will be erected at Chatham, Ont.

Cawthra Mulock, Toronto, has donated \$100,000 towards the erection of an outdoor patient hospital for the free treatment of the poor in Toronto.

The Robert Simpson Co., Toronto, have purchased the Knox Church property at a cost of \$200,000. The congregation will erect a new church.

The Morris Piano Co.'s factory at Listowel, Ont., was damaged by lightning October 8.

The Department of Public Works, Ottawa, are inviting tenders for the erection of a drill hall at Chatham, Ont.

The Windsor Hotel at Sault Ste. Marie, Ont., which was partially destroyed by fire recently will be rebuilt and enlarged.

The Campbell House at Napanee, Ont., was damaged by an acetylene gas explosion October 8.

Within a month the Grand Valley Railway Co. expect to be running cars to Galt, Ont. The engine at the power house is now installed, and the switch to Blue Lake has been completed.

The Department of Public Works, Ottawa, are inviting tenders for the construction of a wharf at Deschambault, Que.

Messrs. Stanley Mills Co.'s departmental store at Hamilton, Ont., was damaged by fire October 12. Loss about \$70,000.

C. R. Somerville's chewing gum factory at London, Ont., was damaged by fire October 14.

The boiler in A. A. Davidson's sawmill in Beverly township, near Galt, Ont., exploded October 8.

The Ontario Pipe Line Co., who have secured a franchise for the supplying of natural gas in Hamilton, Ont., have closed a contract with the Canadian Drilling & Development Co. for the drilling of 30 gas wells in the counties of Lincoln, Haldimand and Welland, Ont.

The Massey-Harris Co. have taken over the business of the Kemp Manure Spreader Co., of Stratford, Ont., and will enlarge the works and operate same in future.

The City Council of St. Catharines, Ont., have granted an extension of six months to the Niagara & St. Catharines Fuel & Power Co., in which to lay their gas pipes in that city.

The traffic on the two Soo Canals in September, 1904, was carried on in 2,501 vessels, with a registered tonnage of 4,145,742 tons. The total freight carried in the month was 5,240,657 tons, of which east bound was 4,139,831 tons, and west bound 1,106,826 tons. Compared with September 1903, the figures of September, 1904, show an increase in vessels using the canals of 268, and of tonnage of 767,819. There is an increase of freight amounting to 981,007 tons.

Wm. Stroud's summer theatre at Nona Park, near Hamilton, Ont., was destroyed by fire October 11. Loss about \$7,000.

The steamer North Star, owned by Captain W. C. Harris of Gore's Landing, Ont., which has been running between Peterborough and Rice Lake points, was destroyed by fire October 10.

The Department of Public Works, Ottawa, are inviting tenders for the extension of the Toronto Island breakwater.

The Canada Coating Mills Co., Toronto, recently organized, with a capital of \$100,000, will erect mills at Georgetown, Ont. The buildings will be 200x80 feet and 220x55 feet; boiler house, 48x40 feet and engine room, 40x30 feet.

A one story addition will be built to the Clyde Woolen Mill at Lanark, Ont.

Messrs. J. Simpson Sons, Toronto, have purchased the machinery of the Enterprise Hosiery Co. at Toronto Junction and have installed same in their knitting mills.

The ratepayers of Merritt, Ont., have voted favorably on a by-law for the exemption from taxation of the Lybster Mills property to be acquired by the Lincoln Mills Co.

The Department of Public Works, Ottawa, are inviting tenders for the construction of a wharf at St. Fidele, Que.

The ratepayers of Rat Portage, Ont., will vote on a by-law to raise \$4,000, for the construction of a bridge across the Canadian Pacific Railway Co.'s tracks on Julius Street in that town.

The Mickle Dymont Co. will extend their factory at Brantford, Ont.

The Presbyterians of Port Hope, Ont., are considering the erection of a new church.

Messrs. A. B. Ormsby & Co., Toronto, have been awarded the contract for 60,000 feet of wired glass sky-lights for the Canadian Pacific Railway Co.'s shops at Winnipeg, Man.

The town council of East Toronto, Ont., have awarded contracts for the new system of waterworks as follows:—The Allis-Chalmers-Bullock Co., Montreal, for generators, the Goldie & McCulloch Co., Galt, Ont., for engines; the Canadian General Electric Co., and Canada Foundry, Toronto, for large induction motors, direct coupling to turbine pumps, three transformers and two steel tanks, 100,000 gallons each, to be 100 feet above the ground, supported by structural steel.

The coke blast furnace at the steel plant of the Lake Superior Corporation at Sault

Ste. Marie, Ont., has commenced work and is running satisfactorily, the first cast of iron being drawn off October 19. The charcoal furnace will be started shortly. The two will employ about 200 men.

The Department of Public Works, Ottawa, are inviting tenders for the construction of an approach to pier at St. Simeon, Que.

A. English, Indian Agent, Sarnia, Ont., will receive tenders for the construction of a steel highway bridge, 35 feet long, over Talbourn Creek, on the town line between the township of Moore and the Sarnia Indian Reserve.

The Metal Shingle & Siding Co.'s plant at Preston, Ont., was destroyed by fire October 19. Loss about \$30,000. The company will resume operations at once.

J. E. Belcher, architect, Peterboro, Ont., has completed plans for the new Collegiate Institute building to be built in that city at a cost of about \$50,000.

Willis Chipman, C.E., Toronto, has prepared plans for a brick outfall sewer which will be installed in Ashburnham, Ont., at a cost of \$10,000.

The Norton Mfg. Co., Hamilton, Ont., are inviting tenders for the erection of a three story building 100x60 feet.

The Department of Railways and Canals, Ottawa, are inviting tenders for sub-structure of Atwater Avenue bridge, Lachine, Que.

H. W. Pearson, secretary-treasurer of Temiskaming and Northern Ontario Railway Commission, Toronto, will receive tenders for the delivery of 225,000 ties along the right of way north of New Liskeard of the Temiskaming & Northern Ontario Railway.

The Canadian Otis Elevator Co., Hamilton, Ont., have been awarded the following contracts for elevators: International Stock Food Co., Toronto, Anderson Furniture Co., Newcastle, N.B.; Calgary Brewing & Malting Co., Calgary, N.W.T.; J. E. Seagram, Waterloo, Ont.; A. C. McCrea, Winnipeg, Man.; Laurentide Paper Co., Grand Mere, Que.; Rodger Hardware Co., Charlottetown, P.E.I.; National Trust Co., Toronto, Masonic Temple, London, Ont.; Warwick Bros. & Rutter, Toronto, St. Boniface Hospital, St. Boniface, Man.; School of Science, Toronto; Collingwood Meat Co., Collingwood, Ont.; Gutta Percha & Rubber Co., Toronto; Beardmore Belting Co., Toronto, Newfoundland Clothing Co., St. Johns, Nfld.

Work has commenced on enlarging the Grand Trunk Railway Co.'s roundhouse at Stratford, Ont. For about two-thirds of the way round a new cement wall is being built about 19 feet farther out, thus increasing the size of the building considerably.

Work has been commenced on the Crown Knitting Mill Co.'s new factory at Toronto Junction, Ont. The building will be 250x350 feet, one story high.

The Canada Foundry Co., Toronto, have a contract with the Canadian Pacific Railway Co. for the construction of a number of engines of the largest and most modern type.

The Iron & Steel Co. of Canada, Belleville, Ont., whose property at the rolling mills was seized for taxes, have issued a writ asking an injunction to restrain the city from selling and for unstated damages for interference with their business.

Hon. C. D. Haines, Kinderhook, N.Y., has asked the Wentworth County Council for favorable consideration of a scheme to construct an electric railway between Hamilton and Brantford, Ont. The proposed line to Brantford would cost about \$300,000.

Work will be commenced on the new conservatory at the Ontario Agricultural College, Guelph, Ont.

J. A. Cameron, Glencoe, Ont., will establish a grist mill there.

The Dominion Government have prepared plans for a new wharf and bridge to be built at the Holland River, Brantford, Ont.

Plans for the new lift lock at Kirkfield, on the Lake Simcoe section of the Trent Canal, will soon be complete, when tenders will be called for.

A new waterworks system is being installed at Oshawa, Ont.

The Taylor Forbes Co., Guelph, Ont., will erect a new factory at Midlands, Ont., at a cost of about \$50,000.

The Baptist church at Hespeler, Ont., will be remodelled at a cost of \$4,000.

Several representatives from St. Lawrence County have taken over two lumber companies at Trois Pistoles, Que., which control 155,000 acres of practically virgin forest. These companies will be amalgamated and will have a capital stock of \$300,000. They will erect modern sawmills with a capacity of 20,000,000 feet yearly.

The Grand Trunk Railway Co., Montreal, will extend their shops at St. Henri, at a cost of \$200,000.

The Metallic Bedstead Co., Quebec City, have been incorporated with a capital of \$50,000, to manufacture iron and copper bedsteads, mattresses, etc. The provisional directors include L. H. Grover, W. Mingle, Megantic, Que., and L. J. Montreuil, Quebec City.

La Fonderie Generale, Varennes, Que., have been incorporated with a capital of \$100,000, to manufacture articles of wood and iron, etc. The provisional directors include A. Bienvenu, G. Massie and C. J. Langlois, Varennes, Que.

The Hamelin & Ayers Co., Lachute Mills, Que., have been incorporated with a capital of \$100,000, to manufacture woollen goods, textiles, etc. The provisional directors include T. H. Ayers, J. T. Ayers and J. T. Griffith, Lachute Mills.

The Electric Maintenance & Supply Co., Montreal, have been incorporated with a capital of \$20,000, to manufacture electrical machinery, and apparatus, etc. The provisional directors include Thos. Sonne, M. A. Sammett and S. W. Smith, Montreal.

The De Lano Osborn Engineering Co., Montreal and Toronto, are preparing plans for an electric lighting and power plant for the city of Charlottetown, P.E.I. Owing to the high prices charged the municipality for public lighting by the local companies, the Council have determined to employ electrical experts to fully investigate the conditions and prepare the plans for a suitable civic lighting and power plant.

The Montreal Piano Mfg. Co., Montreal, have been incorporated with a capital of \$75,000, to manufacture pianos, organs, musical instruments, etc. The provisional

directors include V. Castonguay, E. Gingras, and N. Z. Cordeau, Montreal.

The steamer St. Lawrence owned by the North Shore Steamship Line, Quebec City, was wrecked October 8. Loss about \$40,000.

The Canada Flax Fibre Co., Montreal, have been incorporated with a capital of \$100,000, to manufacture fibre, etc. The provisional directors include T. H. Tombyll, and Jas. Walker, Montreal, G. W. Fowler, Sussex, N.B.

O-So-Ezy Mfg. Co., Montreal, have been incorporated with a capital of \$30,000, to manufacture compounds for polishing woods, etc.; also the compound known as O-So-Ezy. The provisional directors include R. T. Heneker, G. E. Clarke, and A. C. Calder, Montreal.

The Lachute Shuttle Co., Lachute Mills, Que., have been incorporated with a capital of \$50,000, to manufacture articles from wood and to carry on a lumbering business, etc. The provisional directors include T. H. Ayers, J. T. Ayers and J. T. Griffith, Lachute Mills.

Mr. J. de Clercy, C.E., Montreal, has recently installed the following gas engines, etc. of his own invention: A 35 h.p. gas engine with a gas producing plant for making gas from wood and peat in Messrs. Sylvestre Bros.' flour mill at Clairvaux, Que.; an 18 h.p. gas engine with gas producing plant at Sir Geo. Drummond's farm, Beaconsfield, Que. for power and lighting purposes, and a 70 h.p. gas engine and plant in Mr. Roux's sawmills at St. Therese, Que. Gas will be made from the sawdust of the mills and the power will be utilized for driving the machinery in the mills during the day and for lighting the town at night.

A new bleaching plant will be installed in the Montmorency Cotton Mill; at Montmorency Falls, Que., at a cost of about \$50,000.

The American Locomotive Co., Schenectady, N.Y., are now delivering to the Canadian Pacific Railway Co., at the rate of two a day, the twenty consolidated engines which were ordered some time ago.

The Simplex Railway Appliance Co., Montreal, will erect a bolster and brake beam shop 410 feet long at a cost of \$80,000, a steel car shop 700 feet long, a machine and blacksmith shop, a truck shop, a saw and planing mill; an engine and power house, a foundry and a stores department. The total cost of this plant will be about \$2,500,000.

Mr. H. M. Whitney, Boston, Mass., has purchased the asbestos mines at Thetford, Mines, Que. The mines will be worked on a large scale.

The steamer Canada, which was sunk some time ago, has been raised and will be towed to Quebec, where she will be repaired.

At a recent meeting of the Canadian Pacific Railway Co. at Montreal, they increased their capital by \$25,500,000.

The ratepayers of Glace Bay, N.S., will vote on a by law to provide \$15,000 for additional electric light machinery and \$10,000 for building a brick power house.

The Canadian Pacific Railway Co. will erect 30 cabooses at their Farnham, Que. shops at a cost of \$30,000.

The McLean Oil Co will build a large storage warehouse at St. John, N.B.

It is understood that the Dominion Iron & Steel Co., Sydney, N.S., have closed a contract with a German firm for installing a plant for the manufacture of pig iron from waste iron ore. This process, which was discovered a few years ago by Bruck, Kretsham & Co., Germany, reduces the cost of the production to not over 75 cents per ton. The plant will have a capacity of 75 tons per day, and this will be enlarged should the process do all that is expected.

The Nova Scotia Telephone Co will erect a new building at New Glasgow, N.S.

Mr. T. Folley, Newcastle, N.B., will erect a large hotel at that place.

The Dominion Atlantic Railway will erect a 200-room hotel at Digby, N.S.

The Louisburg Club House at Louisburg, N.S., was destroyed by fire October 1. Loss about \$2,000.

The Department of Public Works, Fredericton, N.B., are inviting tenders for the construction of Stinson Bridge in St. John County; rebuilding of Lucy Bridge in York County and for the erection of Roberts Hotel low water wharf in King's County, N.B.

R. C. Elkin, Limited, Fairville, N.B., have been incorporated with a capital of \$20,000, to construct ships, vessels, etc. The provisional directors include R. C. Elkin, F. P. Elkin and F. J. Elkin, St. John, N.B.

The following firms who had their factories and warehouses destroyed in the recent Halifax, N.S., fire, will rebuild: Messrs. Pickford & Black, N. & M. Smith, G. P. Mitchell & Sons, Bryant & Macdonald, and Wm. Robertson & Son.

The city of St. John, N.B., have purchased the St. John Sulphite Co.'s plant at Mispic, N.B., at a cost of \$115,000.

W. J. Boyd's bakery at Winnipeg, Man. was destroyed by fire October 9. Loss about \$50,000.

The Winnipeg Paint & Glass Co., Winnipeg, Man., have increased their capital from \$75,000 to \$250,000.

The Gilbert Plains Milling Co., Gilbert Plains, Man., have been incorporated with a capital of \$40,000, to manufacture flour, etc. The provisional directors include D. Cameron, C. A. Campbell and C. C. Baker, Gilbert Plains.

The new power house at Lac Du Bonnet, Man., is about completed. The building is 500x50 feet with a capacity of 20,000 h.p. and the Canadian General Electric Co., Toronto, will install nine generators.

The City Council of Winnipeg, Man., will purchase two new fire engines and other fire equipment.

A large fire occurred in Winnipeg, Man., October 11, which destroyed warehouses and factories of the following: Bulman Bros., lithographers; J. H. Ashdown Hardware Co.; W. A. Dixon, cigar manufacturer, Kyle, Cheselrough & Co., drygoods; Geo. E. Ellis & Co., jewellers; Grundy Music Co.;

Duffin & Co., photo supplies, and the Hings-ton-Smith Arms Co., sporting goods. Total loss about \$1,000,000.

The Department of Public Works, Ottawa, are inviting tenders for the erection of an armoury building at Virden, Man.

The Edmonton Brewing & Malting Co. are adding a malting plant to their brewery at Edmonton, N.W.T.

The Balgonie Milling Co. will build a flour mill with a capacity of 125 barrels at Balgonie, N.W.T.

A new building for children's shelter will be erected in Winnipeg, Man.

The Y.M.C.A. of Winnipeg, Man., will erect a new building in that city.

The Department of Public Works, Ottawa, are inviting tenders for the construction of a public building at Prince Albert, N.W.T.

The Greenwood-Strathmore Mines, Limited, Greenwood, B.C., have been incorporated with a capital of \$150,000, to carry on a mining, milling and refining business.

The Union Lumber Co., Vancouver, B.C., have been incorporated with a capital of \$100,000, to manufacture lumber, shingles, etc.

The Atlin Market Co., have been incorporated at Victoria, B.C., with a capital of \$10,000, to carry on a meat and fish packing business.

David Spencer, Limited, have been incorporated at Victoria, B.C., with a capital of \$250,000, to acquire the business of David Spencer and to manufacture dry goods, hardware, etc.

The Britannia Lumber Co., Vancouver, B.C., have been incorporated with a capital of \$5,000, to manufacture lumber, etc. The charter members include C. R. Drew, P. Foster, Vancouver, and A. Mattinson, Howe Sound, B.C.

The A. J. Burton Saw Works, Vancouver, B.C., have now completed their works and commenced the manufacture of all kinds of saws, etc.

The Great Northern Railway Co. are extending their road from Morrissey to Fernie, B.C., a distance of about 11 miles. This road will be in operation about December 1, 1904. The main object of building this road is to have a direct haul from the coal mines located here without transferring over the Canadian Pacific line between Fernie and Morrissey, as at present.

The Sullivan Mining Co. are building a large smelter at Marysville, B.C., and when completed it will probably place other properties in the district among the producers, as shipments of low grade ores will not have to be made so great a distance. A smelter will be built in the town of Fernie, B.C. for the purpose of handling zinc ores from West Kootenay. The ground has already been secured for this plant, and work is to commence at once. The smelter will cost \$100,000 when completed, and will give employment to about 75 men.

The Britannia Copper Co., Howe Sound, B.C., have about completed their plant which has cost \$350,000.

F. M. Rattenbury, Oak Bay, Vancouver, B.C., has prepared plans for the erection of a large hotel at that place at a cost of \$1,300,000.

The city of Victoria, B.C., will receive tenders for the delivery of 12,000 feet of cast-iron water pipe. Address W. W. Northcott, City Hall, Victoria, B.C.

The Baer Typewriter Improvement Co. have been incorporated at Victoria, B.C., with a capital of \$5,000, to manufacture typewriting machines, etc.

The British American Coral & Mycenian Marble Co. have been incorporated at Victoria, B.C., with a capital of \$100,000, to manufacture coral, mycenian marble, etc.

The simplicity of the handsome new office building of the B. F. Sturtevant Co., Hyde Park, Mass., brings it into harmony with the shop buildings and still it bears the appearance and grandeur of a modern school house. It is about 45 feet wide and 125 feet long, with four stories and a basement. One half of the basement is occupied by the printing plant and its stock room. Here are printed the catalogues, circulars, letter-heads and all printed forms used in the office and shops. Another portion is used as a lunch room for the office force, while the heating and ventilating apparatus is also located in the basement. Naturally the building is heated and ventilated by the Sturtevant fan system. The galvanized iron heat flues are built into the walls and convey the heated fresh air through register openings into the various rooms. On the first floor are located the production, time and costs departments and the publication department; on the second floor are the sales and accounting departments, cashier, clerks, etc., the manager's office and the filing department. The drafting rooms occupy the whole of the third floor, while the blue-print department is on the fourth floor. The fourth floor also contains two large vacant rooms which may be utilized for future growth, either as offices or drafting rooms. Eight large fire-proof vaults, each about 9 feet wide and 19 feet long give abundant room for the safe keeping of books, correspondence, drawings and valuable data. The first two floors are finished in quartered oak and the upper two in plain oak. The wainscoting, painting, the tinting of the walls and ceilings and the office fixtures are all very tasty and add much in making this office building one of the finest in the country.

Dodge & Day, engineers, Philadelphia, Pa., have placed the orders for generators and motors for Alexander Brothers, Philadelphia, with the Western Electric Co.; for the shafting, hangers, etc., with Geo. V. Cresson Co., and wiring with Buchanan Co., all of Philadelphia. This firm of engineers has just been commissioned to install a heating system in the building lately acquired by Alexander Bros. at No. 412 North Third Street, Philadelphia, and have also taken charge of the installation of additional motors at the plant of Schaum & Uhlinger, Second Street and Glenwood Ave., Philadelphia.

The trade of Cape Colony shows a fair advance for the calendar year 1903 over 1902. A return just made up at the Department of Trade and Commerce at Ottawa, gives the value of imports into the colony in 1903 as \$168,800,271, compared with \$160,530,766 from Canada, the imports increased from \$218,469 to \$1,100,002. The imports from the United States were \$22,080,271, an increase of \$5,750,000, while the imports into the colony from Great

Britain, which were \$108,550,951 in 1902, were \$5,000,000 less last year. The total exports of Cape Colony in 1903 were \$125,143,607, of which Great Britain took \$108,143,607, consisting mainly of raw gold and diamonds.

There was a very large decrease in the production of corundum and emery in the United States in 1903, which amounted to only 2,542 short tons, valued at \$64,102. This is a decrease of 1,709 tons in quantity and of \$40,503 in value as compared with the production of 4,251 tons, valued at \$104,605, in 1902. The imports of emery and corundum continue to be largely in excess of the home production, and in 1903 they were valued at \$321,569, as compared with \$214,842, the value of the 1902 imports. There continued to be an increase of corundum imported, almost wholly from Canada.

ELECTRICITY.

Electrical machinery and appliances of all kinds, electrical power plants and other progress in the electrical industries will be noted here.

There are now three telephone companies in New Brunswick, and all are extending their lines. The oldest, the New Brunswick Telephone Co., are spreading out in the upriver counties where the Union Co., with headquarters at Florenceville, are doing the same. The Central Co. have their headquarters at Bellisle, and there is a rumor of an amalgamation of the Union and Central. If this occurs there will be two strong rival companies in the province.

The latest electrical developments at Shawinigan Falls, Que., go to show how rapidly this branch of engineering is progressing in Canada. A 50,000-volt current is carried to Montreal, a distance of 85 miles and develops in the neighborhood of 10,000 h.p. Work is now in progress on an additional transmission line which will double the amount of power now delivered in Montreal. Half a dozen years ago this locality was almost unknown, its only means of access being a canoe. Now on account of its power riches, Shawinigan is a rapidly-growing city of manufacturing industries.

The Berlin & Waterloo Street Railway Co. are building a new electric power house and repair shops. A 150 k.w. Westinghouse dynamo will be installed.

A company have acquired the rights to the water power of the Gaspercan River in Nova Scotia, with the idea of furnishing electric light and power throughout the Annapolis Valley.

The Goldie & McCulloch Co., Galt, Ont., have just furnished the Winnipeg Street Railway Co. with a compound engine of the heavy duty type, the fly wheel of which weighs 100,000 pounds. This type of engine has been specially designed to meet the requirements of modern central station practice.

The Shawinigan Water & Power Co., Shawinigan Falls, Que., have contracted with the Canadian Westinghouse Co., Hamilton, Ont., for a two-phase rotating field alternator of 6,000 k.w. capacity and 2,200 kilowatts in transformers.

Toronto City Council have adopted the report of a special committee favoring a municipal telephone system and decided to submit to the ratepayers at the January election a by-law to raise \$10,000 for the installation of such a system.

The Western Telephone Co. have built a power house at Red Deer, N.W.T. with the object of furnishing electric light and telephone systems for that place. They may also furnish the power for operating the water works system.

The Bell Telephone Co. are completing a large addition to their main offices in Montreal. The switchboard to be installed will have a capacity for 10,000 subscribers.

A Danish electrical engineer has invented an attachment for the telephone by which messages received during the absence of the subscriber from his office can be recorded and reproduced at desire. The new instrument is called the telegraphone.

Mr. J. F. H. Wyse, formerly manager of the Brantford Electric & Operating Co., is now practising as a consulting electrical engineer. His office is at 16 King Street West, Toronto.

Mr. John Galt, C.E., and M.E., Toronto, has reported that water works and electric light systems for the town of Indian Head, N.W.T., would cost about \$87,000. The E. S. Harrison Co., Winnipeg, Man., have submitted a proposition to establish an electric plant at that place.

The Mexican Light & Power Co., which is controlled by Toronto and Montreal capitalists, have secured a contract from the Federal Government of Mexico for the entire lighting of the city of Mexico and suburbs till 1917, also for the lighting of the post offices and Government building in that city. The contracts were arranged by Mr. C. H. Caham, Halifax, N.S., attorney for the company.

The Electric Development & Securities Co., incorporated under the laws of the state of New York, have been granted a license to conduct business in Ontario, under the name of the International Electric Securities Co. Authority is given to develop power and to carry on a general contracting business. Mr. F. K. Foster, Toronto, is attorney for the company.

Messrs. Marchand & Co., electrical contractors, Ottawa, have acquired an interest in a water power at Bryson, Que., and have in contemplation a scheme to supply light and power to Bryson and the adjacent villages.

The Toronto Street Railway Co. have introduced on their system a testing car, which is a marvel in electrical ingenuity, and which, it is claimed, will not only save labor, but will be a means of preventing accidents. The car is so constructed that it registers every defective joint, rail or crossing, every weakness or escape of current, or other defect in the system as it travels along the car routes, and this register is so complete that as soon as the car runs into the barns the exact places where the defects exist are shown, and a repair wagon can go straight to the point. The car also registers the amount of current passing along the wire throughout its whole route.

The municipality of Chiviloy, province of Buenos Aires, S.A., is open for proposals

to build an electric lighting plant for that town.]

The municipality of Philippopolis, Bulgaria, will receive proposals for erecting an electric plant for lighting the city and furnishing power for running a tramway line.

The city of Wellington, N.Z., will extend its electric tramway system to Island Bay, Ohiro, and Kilbirnie, N.Z.

The Government of Roumania will install an electric lighting plant in the town of Caracul.

The Electrical Ovtsehar and Kablar in Tschatschak, Kingdom of Serbia, is open for bids to furnish turbines and generators, with requisite hydro-electrical material and cables for transmitting power to a distance of about 44 miles.

FUEL.

For names of fuel dealers see "Coal and Coke" in Classified Index.

The fuel supply question is a most important one to Canadian manufacturers. The information published in this department will keep the readers posted on sources of production.

A despatch from Shamokin, Pa., states that the fire in the Enterprise mine near there has assumed such alarming proportions that fears are entertained that part of the village of Excelsior, underneath which the mine runs, may be swallowed up by caverns if the fire is not checked. The Pennsylvania and Reading Railroads are also in peril. They run over part of the danger zone. The mine fire has raged so fiercely that all the timber in the slope has been consumed, and it is thought the flames pushed their way to the mammoth vein and gaited it. This vein is the thickest and the best in the coal field, and if it becomes ignited thoroughly it may take years to conquer the blaze.

The Nova Scotia Coal Co. are contemplating outside markets for their superfluous product. Two or three years ago, the experiment was made of a trial shipment for use on the Swedish Government railways, that proving successful, between 25,000 and 30,000 tons annually has been exported to Sweden for general consumption in that country. Now Mexico is to be tried also Ontario, and seeing that the markets in the last named province are now practically dominated by coal from the States, Nova Scotia fuel will probably in time become an important factor in Eastern Ontario districts. Even Canada's two great railroad companies make the bulk of their coal purchases in America, and they, no doubt, will readily take the other, particularly if, in course of time, a regular coal traffic is assured them to various points.

The control of the Cape Breton Coal, Iron & Railway Co. has been taken over by an English syndicate, headed by Mr. Horace Mayhew and Messrs. Coates Sons & Co., London. Mr. Thos. Lancaster, to whom the credit is due of carrying negotiations to a successful issue, went to London twice last fall to meet Messrs. Coates Sons & Co., and

has been conducting negotiations with them ever since. The spring of this year he invited Mr. Horace Mayhew to join. Messrs. Mayhew and Leech are large coal owners and operators in England, and control collieries there having an output exceeding 2,000,000 tons a year. The new directors are: H. Mayhew, president; T. Lancaster, vice-president, and Wm. Hanson (Hanson Bros., Montreal), treasurer; E. W. Molsley, secretary; and Messrs. Gladstone, Thompson, C. H. Hanson of London, N. Ferguson and Crowe, of Sydney. Plans are now being prepared in England at the office of Messrs. Mayhew and Leech for extensions and the equipment will be ordered as soon as the plans are completed. It is expected to have air compressors, screens, boilers, etc. erected, a short railway siding between the Sydney & Louisburg Railway, and the mines under rapid development by the first of the year.

George H. Mills has been appointed Buffalo sales agent of the Bessemer Coal & Coke Co., Cleveland, Ohio, and has opened an office in the Prudential Building.

The entire coal output of the United States, from the earliest times to the close of 1902, has been estimated to amount to 4,860,000,000 short tons to December 31, 1902. The cubical dimensions of a ton of coal will vary from 33 to 40 cubic feet. Taking 37 cubic feet as an average for the total product of the United States, we find that this mass of 4,860,000,000 tons would contain, approximately, 160,000,000,000 cubic feet. A pyramid built of this material as high as Pikes Peak (14,108 feet) would have for its base a rectangle, 114 miles square. A cube constructed of it would cover an area of 2.4 square miles.

A new fuel called radiant, to be used in connection with gas and other fires, has been invented by two engineers of Southend, England, and if it be proved that it can do all that is claimed for it it will cause as great a revolution in the present system of gas heating as did the introduction of the Webbech mantle in gas lighting. The inventors claim for radiant, (1) That it gives treble the heat with the same gas consumption as an ordinary gas fire; (2) That it takes up the carbonic oxide from the air and purifies the atmosphere; (3) That it does away with the unpleasant smell given off by gas fires; (4) That it burns brightly like a coal fire; (5) That it is as cheap as fire clay and is inexhaustible. The two young inventors are connected with one of the largest firms of gas engineers in England, and have been experimenting for years with a view to producing a fuel such as radiant. Radiant will take the place of the asbestos or fire clay lalls, and will, it is said, give out an intense heat. It is made from materials that are now waste products of chemical works. The new fuel captures the blue flame, which at present is lost, and converts it into intense heat and also possesses the power of retaining heat to a very great extent.

Owing to the inability of the railroads to handle the increasing coal tonnage, the Pittsburg & Buffalo Co. have bought a freight locomotive which is being used to shift cars at the Hazel mine at Canonsburg. The company own railway cars, and with the assistance of the extra engine are now

able to load 100 cars a day at this mine. They also expect to increase their motive power and make extensive additions to their rolling stock.

The coal supply for the new Canadian Pacific Railway line from Toronto to North Bay will be taken from Byng Inlet instead of Owen Sound, Ont. There is a line of boats already running from Buffalo to that inlet.

A large seam of coal has been discovered near East Kootenay, B.C., on property owned by the Western Oil & Coal Co., a concern composed largely of Vancouver capitalists. The district where the deposit was found is on the route of the Great Northern's new line to Fernie, B.C.

W. H. Aldridge, who is connected with the company that is developing the coal resources at Banff, N.W.T., says that about 200 tons of nut and the larger sizes of anthracite are being produced daily, and 100 tons of the small sizes. Between 400 and 500 men are employed, the majority on construction and development work, and another year will be required to bring the mines up to their full capacity. Plans are being matured for developing the soft coal seams at Banff, but it will be some time before actual mining operations will commence. The bulk of the anthracite shipments go to points west of Banff, some of the coal reaching the Pacific coast at Vancouver, B.C.

The Dominion Railway Commission have given judgment providing that the rate for coal from the Detroit and Michigan frontier shipping points to Almonte, Ont., must not be more than 20 cents above the rate to Carleton Place Junction, Ont. The Almonte Knitting Co., Almonte, Ont., showed that the Canadian Pacific Railway Co. was charging 40 cents over the rate to Carleton Junction, although only seven miles distant.

The total output of the Crow's Nest Pass Coal Co., during the year ended June 30, 1904, was 769,419 tons, of which 360,462 tons were converted into coke. The shipments of coke to the United States during the year amounted to 62,478 tons, valued at \$252,992, and the shipments of coal to 156,727 tons, valued at \$315,096.

The three coal companies operating at Frank, Blairmore, and Coleman, N.W.T., have been producing an average of 600 tons a day during the year. The entire product has been used in Canada.

New coal fields are being opened up on the Elk River about 50 miles north of Fernie, B.C., but it will be necessary to construct about 35 miles of railway to place these fields in touch with the market.

In order that some idea of the bulk represented by the coal production of the United States in 1903 may be obtained, it might be stated that, if the entire production were loaded on freight cars with a capacity of 30 tons each, the trains would occupy one-quarter of the entire railway trackage of the United States. Taking an average of 30 cars to a train, it would require 16 times as many freight locomotives as there are in the United States to move this tonnage in one day. If spread over the surface of Manhattan island, which has an area of 22 square miles, the entire island would be covered to a depth of nearly 25 feet.

COAL STORAGE IN CANADA.

A boat trip up or down the St. Lawrence River will show large accumulations of soft coal at every point which the Canadian railroads can use to advantage for storage purposes. Considered all together, this accumulation was remarked by parties with whom we talked to be unprecedented. Brockville, Ont., one of the few harbors where both the Grand Trunk and the Canadian Pacific have facilities, was noticed to be especially alive with activity. This is not only a strategic point for the Grand Trunk, but it is also a direct source of supply for the Brockville-Ottawa line of the Canadian Pacific, with numerous connections above with the latter system. When the present season closes it will have been a remarkably prosperous one for the coal handlers along this important waterway, as they have lost very little time and their pay ranges from 30 cents per hour for regular day labor to 50 cents per hour for Sunday work. Of the latter there has been considerable this summer to accomplish the prompt unloading and quick return of vessels for other cargoes. One shoveller at Brockville told us that he had several times worked from 30 to 34 hours without rest or sleep, and that twelve men in the Canadian Pacific road plant at that place had handled as much as 715 tons of coal per day, the respectable average of 59.7-12 tons apiece. Up to this time most of the coal along the St. Lawrence is handled in old-fashioned ways, but there are signs of a new interest in coal handling and storage facilities. Ogdensburg, N.Y., has long had modern plants on a large scale, and there are a few labor-saving devices on the Canadian side. At Alexandria Bay, N.Y., a start has been made in the way of quick fueling of pleasure yachts on the pocket principle, while a number of projects are being considered by the progressive retailers on both sides of the river. Farther up in Canada, also, the same heaven is working, and it seems likely that five or ten years more will witness a revolution in coal-handling methods throughout this section.

THE COLEMAN, N.W.T., COAL FIELDS.

A correspondent of the Nelson, B.C., Daily News, writing of the International Coal & Coke Co. at Coleman, N.W. T., says: Up here near the portal of the Crow's Nest Pass, nature with a lavish hand deposited bituminous coal measures, which for thickness and quality are not rivalled elsewhere. The development of this potential wealth, so essential to the economic progress of a young nation like the Dominion, dates back only yesterday. Coleman, where the Dennison colliery of the International Coal & Coke Co. is located, had no existence a year ago; to-day it is pulsating with life, and gives promise of soon becoming an important factor in the coal industry of the entire district. The transformation has been simply short of marvelous. The coal company is rapidly completing the installation of a plant with a capacity to handle an output of 2,000 tons of bituminous coal daily. Since last October no less than 30,000 tons of coal have been extracted in the course of development work. A fortnight hence, even before the most essential equipment shall have been installed, the colliery will be maintaining an output of 500 tons daily.

It is conservatively estimated that the production will reach 1,000 tons daily by January 1 next, and 2,000 tons per day, the limit of the plant, by May or June next. Thus far the entire output has been sold in advance. To accommodate the growing traffic, the Canadian Pacific Railway have already built two and three-quarter miles of track and sidings on the coal company's property at Coleman. A double battery of 104 ovens, capable of producing 140 tons of coke daily, were completed recently, and provision has been made for the erection of 300 additional ovens at an early date. A portion of the coking plant is now in operation. It is producing a superior quality of coke, which finds a ready market in British Columbia smelting centres, where it is utilized in the reduction of metalliferous ores.

This, in outline is the story of the result accomplished at Coleman in less than 12 months. The company employs about 300 men, including mechanics engaged in construction work. A noteworthy feature is the fact that the coal extracted in the course of development has thus far actually paid all costs of development of the mine.

The bituminous coal lands of the company extend about seven miles north and south on the strike of the coal measures, and have a width of one mile. The greater length of these lands is south of the railway. So advantageously are they situated that the main line of the Crow's Nest branch of the Canadian Pacific Railway passes within 200 yards of the main entry of the mine. The seams, seven in number, run parallel, north and south, and are embraced in an area of less than 700 feet wide. The croppings can easily be traced at intervals on the surface for two miles north and five miles south of the track, all within the limits of the property of the company. The seams have a westerly dip of about 45 degrees, and are regular and consistent, and in good condition wherever tested. With one exception they are all east of and under that now known as No. 2, and on which for the present most of the development has been done. No. 1, the most westerly seam, is about five feet in thickness; No. 2 is 14 feet; No. 3 which is opened two miles away to the southward, is 17 feet; No. 4 is eight feet, and No. 5 about seven feet. A Pittsburg consulting coal mining engineer last year estimated the coal in sight above the level of the Old Man River at 64,000,000 tons. The coal taken out in development is excellent for steaming purposes, being absolutely free from impurities. It runs from 60 to 65 per cent. in fixed carbon, and makes a firm coke of exceptional quality.

Development work is now being concentrated on No. 2 and No. 4 seams. The main entry and airway driven on No. 2 seam are now in about 2,200 feet. This seam is very uniform throughout, averaging 14 feet in thickness. Coal has been extracted from this working daily since the commencement of operations. At a point 1,000 feet distant from the pit mouth of the main entry and airway, a crosscut tunnel has been driven at the 45 degree angle through the rock, intersecting No. 3 seam 150 feet distant, and encountering No. 4 seam 80 feet farther east. The development of No. 3 seam has not yet been undertaken. An entry and airway have been driven south from the crosscut tunnel along No. 4 seam for a distance of about 500 feet. This seam is eight

feet in thickness, possesses a good roof and bottom and in the matter of dip presents the same uniform characteristics of No. 2 seam. The entries on the coal have already opened up a large area of ground. The mine is being developed on the stall and pillar system, with barrier pillars. Later on the crosscut tunnel from No. 2 to No. 4 seams will be extended farther east to intersect three other seams. The face, 2,000 feet from the portal of No. 2 seam, owing to the gradual rise of the mountain, gives a depth of 400 feet on the pitch of the seam. Lifts will be made every 300 feet. This will provide rooms 300 feet in length, thus affording a rapid and economical method of development and extraction, combined with the utmost safety. Every device known to modern coal mining is being utilized. The main system of car haulage will be compressed air. The workings will be ventilated by a Capell reversible fan, 16 feet in diameter, driven by a two speed 150 h.p. motor, and will furnish 150,000 cubic feet of air per minute. This fan is now being installed on No. 2 seam at the surface, and will be in operation shortly, enabling the mine forthwith to maintain an output of 500 tons of coal per day.

The broad and comprehensive policy of the company is evidenced by the large expenditure incurred in the erection of surface works, including the power house and tippie, all of which are in an advanced stage of completion. These works are situated north of the Old Man River and alongside the railway. The power house, 28x50 feet, is a fireproof stone structure. It contains six boilers, each of 125 h.p. capacity, furnished by the Erie City Iron Works, Erie Pa. The engines, two in number, are each of 400 h.p. capacity. They were built by the Phoenix Iron Co., Meadville, Pa. The engines are directly connected with two 250 kilowatt electric generators (equal to 335 h.p. each) supplied by the Westinghouse Electric Co., Pittsburg, Pa. These generators will furnish the electrical current for the various motors to operate the fan, tippie, larries, machine shop and for lighting the town of Coleman. Other machinery equipment comprises a Canadian Rand Drill compressor of 1,000 pounds pressure for the purpose of furnishing air for the car haulage throughout the mines. The machine compresses air at the rate of 750 cubic feet per minute.

The tippie, situated alongside the railway track, and 200 yards distant from the colliery, is the largest affair of its kind in the Crow's Nest district. It has a handling and storage capacity of 4,000 tons of coal daily. A steam hoist of 100 h.p. capacity, built by the Jenckes Machine Co., Sherbrooke, Que., will hoist the cars from the yard in a self-dumping cage of 80 feet to the top of the tippie. The coal, after passing over a number of screens, falls upon two picking tables with a capacity of 100 tons per hour, and driven by a 25 h.p. electric motor. Falling by gravity it is automatically screened and delivered in bins in the lower floor of the tippie, ready for shipment by rail. The slack coal previously separated, is delivered into other bins, whence it falls into the larries (cars) which in turn convey it and automatically dump it into the coke ovens a short distance away. The tippie has a capacity of 2,000 tons every ten hours. If worked full time it will be

able to handle the output of the mines for several years to come. The larries which convey the slack coal to the coke ovens are operated by electricity. The loading of the railway box cars will be effected by means of an Ottumwa box car loader, which is located in front of the tippie and alongside the railway track. This novel device is a great labor saver and prevents breakage of the coal. The company have also erected machine, blacksmith and wood-working shops. The power is furnished by a 25 h.p. electric motor.

At the present rate of development, Coleman is destined to become one of the largest and most prosperous towns on the Crow's Nest line. The Canadian Pacific Railway is a large consumer of coal, and the wants of thousands of settlers on the prairies for purely domestic purposes are growing apace and are likely soon to tax the productive capacity of many coal mines. A considerable proportion of the output will be converted into coke, for which a ready market is already assured not only in the smelter towns of British Columbia, but among leading American smelting centres like Great Falls, Helena, Butte and Anaconda. The market is practically unlimited, especially as Canadian coke is of the highest standard of quality, and can be sold as cheaply as western American coke of inferior grade; moreover the mileage to Montana is not greater than to Boundary smelting centres. The plant and equipment as well as the economical method of mining now in vogue at Coleman will absolutely enable Coleman coal to meet all competitors in the western markets on both sides of the line.

The president of the International Coal & Coke Co. is A. C. Flumerfelt, a capitalist of Victoria, B.C. Mr. Flumerfelt has long been a factor in the economic development of the West. He is largely interested in mining, smelting and lumbering. His decision to engage in coal mining was only reached after a careful study of the possibilities of the industry. Mr. Flumerfelt is president of the British American Trust Co., and a director of the Eastern Townships Bank, one of the solid financial institutions of eastern Canada. The general manager and vice-president of the coal company is H. N. Galer, who possesses exceptional executive ability and a capacity for hard work. Mr. Galer, two months ago, resigned the position of assistant general manager of the Granby Consolidated Mining, Smelting & Power Co. to assume the active management of the International Co. at Coleman. His administration here has resulted in the establishment of the most cordial and satisfactory relations between the management and the employes, embracing men of nearly every nationality.

The general superintendent is Edward E. Reynolds, C.E. and M.E., who resigned the office of mine inspector of the Seventh District, Pennsylvania, in January last to enter the service of the International Coal & Coke Co. Since his arrival in Coleman, Mr. Reynolds has directed the work of opening up the mine and the construction of the surface works. Mr. Reynolds has been engaged in coal mining operations since boyhood, filling every position from errand boy to mine manager. The coal measures at Coleman proved a revelation to him. He is authority for the statement that the No. 2 seam here is nearly twice the size and of equally good

quality as the famous coal seam in the Connelville region of Pennsylvania.

OPPORTUNITIES.

Manufacturers and others in need of machinery, supplies, etc., of any kind are requested to consult our advertising columns, and if they cannot find just what they want, if they will send us particulars we will make their wants known free of cost, and in this way secure the attention of those who may be able to supply them. No charge for publishing what is wanted nor for giving information. When writing to enquirers kindly mention The Canadian Manufacturer.

The Government of Cape Colony, South Africa, contemplate the erection of cold storage depots in all the ports and in the principal trade centres of that country, and the purchase of a large number of refrigerator cars for their railroad lines. The growing movement among the South Africans to form agricultural co-operative associations also tends toward the increase of cold storage facilities.

The Hungarian ministry of trade will purchase about 300 motor cars for use upon the local railways. The firm of Ganz & Co., in Budapest, have received an order to deliver 120 of these cars, at a cost of about \$821,700, which will be paid in installments. It is proposed to run these motor cars in addition to the regular scheduled trains whenever the traffic requires.

The town of Izel, Belgium, is about to construct waterworks.

The British Consul at Buenos Aires, S.A., reports that the demand for milk sterilizing apparatus is constantly increasing in that city.

The Belgian railroad department will contract for the delivery of 114 freight cars, 64 passenger cars, 18 baggage cars, and 21 iron turntables.

A branch railroad is to be built from the Campillos line to La Vega Azucarera Granadino, Granada, Spain.

Tenders for building a railway 37 miles in length from Ilheos to Conquista will be received by the secretary of agriculture, Bahia, Brazil.

PUBLICATIONS.

The publishers of The Canadian Manufacturer solicit in advance, if possible, catalogues, circulars, and other industrial publications issued by manufacturers. We wish to review such literature, and bring the principal points to the attention of our readers.

The Canton Foundry & Machine Co., Canton, Ohio, have issued a new catalogue on sheet metal machinery, etc.

The Automatic Threading Lathe is described in a new catalogue issued by the Automatic Machine Co., Bridgeport, Conn. H. W. Petrie, Toronto, is Canadian sales agent for the company.

Wayland Williams, Montreal, has issued folders on the Roberts patent filling machine for which he is agent.

The Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., have issued a new catalogue on power presses.

W. R. Scott, Toronto, is mailing catalogues on Victor safes for which he is Canadian agent.

The Bristol Co., Waterbury, Conn., have issued catalogue No. 16, devoted to the well known line of Bristol's recording volt, Ampere and Watt meters, which cancels all previous catalogues and lists. An accompanying bulletin shows the exhibit of this company in the Electricity Building at the St. Louis Fair.

A very valuable report is being compiled for the Department of Mines by Mr. J. Walter Wells, Ottawa, who is now investigating the lime, clay and shale deposits of Manitoba in the interests of the cement industry. If these materials abound to any extent it will mean a great thing for the settlers in the West, where timber for building is scarce and costly. This inquiry is another of the steps which the Minister of the Interior is taking to convert to practical use the natural resources of Canada.

The Proceedings of the Canadian Institute just issued contain a number of interesting papers read before the Institute during the past year.

The Garvin Machine Co., New York, have issued a most valuable booklet in which are illustrated and described about every machine tool yet invented. The booklet should be in the hands of every iron or wood worker for no one can fail to gain valuable information from it.

The Lloyd Automatic Weaving Machine Co., Minneapolis, Minn., have issued descriptive matter of their machinery. Messrs. Sheetz & Lynde, Toronto, are Canadian representatives.

Concerning the recent explosion at the Bolt Works of the Toronto Bolt & Forging Works, the Canadian Casualty & Boiler Insurance Co., Toronto, in a letter to their customers, say: "This boiler explosion is the third which has occurred during the last three months in the Province of Ontario, and in each case the cause has been traced to negligence, demonstrating that boilers do explode, consequently we now write requesting that you caution your engineer concerning the safety valves, glass water gauge, try cocks and blow-off pipes. These should always be kept in perfect working order—the first, that it may relieve the boiler of any undue increase of pressure, the second, that the exact height of water in the boiler may always be correctly known, and, the third, that they may not leak and cause a dangerous shortness of water."

"The Lubrication of Axles" is the title of the latest booklet of the Jos. Dixon Crucible Co., Jersey City, N.J., and the information given therein will be found of much value to those interested in the economies of lubrication.

The scope and purpose of trust companies and a brief account of their origin and development is contained in the little volume that has been issued by Ernest Heaton, B.A.,

of Osgoode Hall, Toronto. The book shows a wide knowledge of the subject with which it deals. "The trust company idea," is explained from an international standpoint. All the special features of the trust company in Britain, the United States, Australasia, and Canada are set forth concisely and clearly. The services rendered by the trust company, the greater safety in the management of estates, and the expert treatment of large financial affairs, are all dealt with in an authoritative manner. The work will prove of value to financiers and the legal profession.

The International Correspondence Schools, Temple Building, Toronto, have issued a new scholarship in structural and concrete work which they are now advertising.

The British Tariff Commission have published the first volume of their report on their investigation, a copy of which is now before us. All the members of the commission admit that Great Britain's iron and steel manufacture—compared with that of other countries—has retrograded. The cause for this, the commission declares, is not a lack of British energy or of able labor, but the lower prices at which German and American manufacturers sell their products in foreign markets, they obtaining high prices in their home markets, which are closed against outside competition by high tariff duties. Thus they can dump their surplus iron and steel products on British markets, which would not be possible if Great Britain were to discard its free trade policy. The commission deems it necessary that a protective tariff system be inaugurated containing maximum and minimum rates, the latter to be given to the products of those countries which levy low customs duties on British goods, and that, besides this, preferential rates be given to any British colony which discriminates in favor of manufactures of the United Kingdom. The commission proposes the following schedule as minimum rates on imported iron and steel manufactures: iron ore, free; pig iron, 5 per cent. of the value; partly manufactured products of iron, rails, girders, foundry iron, etc., 6½ per cent. of their value; fine plate, nails, screws, bolts, wheel tires, car wheels and axles, crucible cast steel, and other steel manufactures not named, 10 per cent. of their value. The report of the commission cites as a case in point the wire-tack industry, which has been destroyed in England by the free entry of the German and American products at extremely low prices. Later on, when the British-wire-tack manufacturers had been forced to quit, the prices of the foreign-made tacks were raised 15 per cent. to the British purchaser.

Mines and Minerals, Scranton, Pa., have sent us a copy of their classified directory of reliable manufacturers and dealers in mining and milling machinery supplies, etc. The various headings are alphabetically arranged so as to make it easy to find the names and addresses of concerns from whom any desired article may be purchased.

The Lowe Farm Elevator Co., Lowe Farm, Man., have been incorporated with a capital of \$6,000, to manufacture and erect grain elevators, chopping mills, etc. The provisional directors include J. Schroeder, P. K. Rempel and H. E. Peters, Lowe Farm.

PERSONALS.

Mr. H. K. Leighow, representing the Reese-Hammond Fire Brick Co., Bonivar, Pa., was in Toronto, Owen Sound, and other Ontario manufacturing centres last week in the interest of his company. He made a number of sales of fire brick on the trip.

The Engineers' Club, of Toronto, held a meeting on Wednesday evening last. The regular monthly meeting was held on Wednesday evening, October 12. The officers of the club are: president, Capt. Killaly Gamble, secretary, Willis Chipman, treasurer, A. C. Larkin.

The Fairbanks Co., Montreal and Toronto, have been appointed Canadian agents for Browne & Sharpe, Providence, R.I., manufacturers of machine tools.

The Toronto office of the International Correspondence Schools gave a free lecture and smoker in the Temple Building on the evening of October 15 to their many students and persons interested in their popular system of self education.

President Doolittle, of the Toronto Automobile Club, announces that the proposed automobile show, to be known as the Royal Canadian Automobile and Sportsmen's Exhibition, will be held in Toronto from February 27 to March 4 next.

Mr. W. C. Milner, Halifax, N.S., the author of a pamphlet dealing with the coal industry was in Toronto this week.

Mr. O. L. Remington, representing Messrs. Wm. McLean & Co., manufacturers' agents, 317-319 Flinders Lane, Melbourne, Victoria, Australia, who has been taking in the sights at the St. Louis Exposition, will probably extend his American visit to Toronto and other manufacturing centres in Canada.

Peter Lyall, head of the firm of Messrs. Peter Lyall & Sons, who are putting up the new arts building of Ottawa University, has retired from active business after being connected with the building industry for the last 30 years.

The John Bowman Hardware & Coal Co., London, Ont., are in the hands of receivers. It is understood that the liabilities amount to about \$100,000. The assets will likely be about \$75,000, and it is said that Mr. John Bowman, who is the sole owner of the stock, will make an offer to compromise with his creditors. Jenkins & Hardy, Toronto, have been appointed receivers. The firms most largely interested in the matter are located in Worcester, Springfield, Binghamton, New Haven, New York, Rochester, Buffalo, Columbus, Elmira, Austin, Pennsylvania and Syracuse. The only Canadian cities in which the failure will be felt are Toronto, Montreal and St. John, N.B. Mr. John Bowman is one of London's best known citizens, and is an ex-president of the Board of Trade. His many friends are hopeful that his business matters will soon be placed on a satisfactory basis.

Mr. R. H. Campbell, Ottawa secretary of the Canadian Forestry Association, was in Toronto consulting Mr. Southworth and Dr. Clark, of the Ontario Forestry Department, in connection with the issue of the first number of the organ of the Association.

At the recent regular monthly meeting of the Montreal branch of the Canadian Manufacturers' Association, Messrs. J. J. McGill, the Hon. J. D. Rolland and Mr. J. T. Hagar were appointed to represent the Montreal branch in the conference with the Dominion Trades and Labor Congress which will probably be held in Toronto within a few weeks. The National Trades and Labor Congress of Canada requested that in any conference held between employers and employees in this country the National Trades and Labor Conference should have a voice. The committee regarded the request with favor, and it was forwarded to the executive committee which has control of the arrangements so far as the Manufacturers' Association is concerned.

Dr. Hans Goldschmidt, the eminent Chemical Scientist, of Essen-Ruhr, Germany, was in Montreal last week, the guest of Mr. William Abbott, his representative in Canada, and on Friday last, delivered a lecture, illustrated by lantern slides, at McGill University, on the Alumino-Thermit process of welding, as well as on its use in metallurgy and its use in the foundry, with practical demonstrations.

The Booth Copper Co., Toronto, have opened offices and warehouses at 120 William St., Montreal. An attractive announcement of this extension of business has just been sent out by the company.

Dr. Haanel, Superintendent of Mines, Ottawa, has been notified that a gold medal has been awarded to the systematic collection of alluvial gold from British Columbia and the Yukon which was placed on exhibition at St. Louis. The collection consists of 75 specimens of gold dust from the Yukon Territory and 13 specimens of gold dust and five nuggets from British Columbia. Although not especially a show collection, it is of great educational value, and will probably find a place on the shelves of the National Museum when that building is completed.

The Ontario Lime Association, 118 Esplanade Street East, Toronto, have been appointed Canadian agents for the Dover Fire Brick Co., Cleveland, Ohio, manufacturers of the well-known "Dover" and "Buckeye" brands and various other fire clay products.

R. I. Henderson, managing director of the Henderson Roller Bearing Mfg. Co., is opening an office in Winnipeg, Man., to take care of the Western business of his company.

The Canadian Railway Club will meet in the King Edward Hotel, Toronto, on Friday evening, October 21, to hear a paper on "Fuel Economy" by Mr. John V. Paul, General Fuel and Locomotive Inspector of the Canadian Pacific Railway. This club is one of many organizations of its kind on this continent aiming to bring together railroad men, electric as well as steam, so that they can discuss together the problems of the day. The club has over 350 members, and publishes its own proceedings in magazine form. The headquarters are at the Windsor Hotel, Montreal, president, Mr. T. McHattie, Master Mechanic Grand Trunk Railway; secretary, Mr. W. H. Rosevear, jun., Montreal.

MARINE ENGINEERING.

Among the well known marine engineers and architects of Toronto may be mentioned Mr. Edward Ramage, who, for the past dozen years, has been connected with marine work in Toronto, during this time having been in charge of the construction of the hulls of many fine passenger and freight steamers. Mr. Ramage was for some years connected with the Bertram Iron Works and later with the Clyde Steel Works. Last year he was in charge of the extensive repair work on the steamer Chicora of the Niagara Navigation Co.'s line, since the completion of which he has been engaged in marine construction and repair work in Toronto. Mr. Ramage has leased the dock at the foot of Berkeley Street, upon which he is now erecting buildings suitable for carrying on the work of shipbuilding and repairing. He is prepared to handle all kinds of steel tank, structural and ship work and all kinds of marine repair and alteration work, etc.

CANADA'S MERCHANT MARINE

The total number of vessels on the registry books of the Dominion on December 31, 1903, including old and new vessels, sailing vessels and steamers and barges, was 7,020, registering 683,147 tons, an increase over 1902 of 184 vessels and 30,534 tons. The number of steamers on the registry books on the same date was 2,419, with a gross tonnage of 338,251 tons. Assuming the average value to be \$30 a ton, the value of the registered tonnage of Canada December 31, 1903, was about \$20,494,410. The number of new vessels built and registered in the Dominion during the last year was 328, of 30,323 tons. The estimated value of these vessels at \$45 a ton is \$1,364,535. The 7,020 ships and steamers are divided by provinces as follows: Ontario, 1,778; Quebec, 1,228; Nova Scotia, 2,069; New Brunswick, 929; British Columbia, 629; Prince Edward Island, 164; Manitoba, 139, and Yukon, 14.

There are 77 ports of registry in the Dominion, an increase of two in the year, distributed as follows: Ontario, 38; Nova Scotia, 21; New Brunswick, 7; Quebec, 5; British Columbia, 3; Prince Edward Island, Manitoba, and Yukon Territory, one each. The two ports added during the year are Fort William and Midland, Ont. Since these returns were made up the registry office at Port Rowan, Ont., has been closed and the records transferred to Simcoe, where the collector's office is situated. Quebec City still retains its position as the port where the greatest number of vessels are registered, the number being 640 against 654 in 1902, while Montreal has the largest tonnage, 94,526, against 91,347 in 1902. Toronto has the largest number of steamers on her registry, 255, against 240 in 1902; Montreal comes second with 217 steamers, and Ottawa third with 204; the tonnage of the 217 Montreal steamers being nearly double that of the 255 at Toronto. In point of ownership of net tonnage Canada stands eighth.

CANADIAN STEEL RAILS.

Mr. Thomas J. Drummond, Montreal, director of the Lake Superior Corporation, has made a statement regarding Sir Thomas Shaughnessy's criticism of the steel rail duty, which was recently published.

"The position taken by Sir Thomas Shaughnessy," said Mr. Drummond, "is quite proper. It is the position that was taken also by the Dominion Government in passing the act relating to steel rails in 1903, namely, that the duty should be imposed on steel rails exported into Canada whenever satisfactory evidence was presented that rails of suitable quality and in sufficient quantity were being made in Canada to supply the ordinary demand.

"This was the position taken by the Dominion Government also when the reorganized company proposed to start up the Soo mill; and Messrs. R. W. Hunt & Co., who are recognized as leading experts in matters of this kind, were authorized by the Dominion Government to make the necessary inspection, both as to quantity and quality, and the action of the Government has been based upon the report of R. W. Hunt & Co.

"A good deal has been said in regard to the mill and blast furnace plant at the Soo. In the main, these statements have been made without knowledge of the actual facts, and if followed up would be generally found to be based on statements made by parties who were antagonistic to the manufacture of rails in Canada. To anyone who is really interested in the question the simplest reply we can make is to refer them for information, as to both the blast furnaces and steel plant, to the Wellman-Seaver-Morgan Co., Cleveland, Ohio, who have inspected the works and are in a position to state from a mechanical point of view how they compare with similar plants in the United States and elsewhere.

"As for the quality of rails that can be turned out at the Soo and are being turned out to-day, we can refer them to Messrs. R. W. Hunt & Co., Chicago, Ill., who are acting as inspectors for the Dominion Government, and have inspected also for the Canadian Pacific Railway, and, in fact, for practically all the leading railways in the United States and Canada. I am quite sure that the officials of the different railway companies will be thoroughly well satisfied to accept the authorities I have mentioned in any matters relating to steel rails, mills, blast furnaces or quality of product.

"In so far as raw material is concerned, the ores that enter into the manufacture of over 70 per cent. of the rails manufactured in the United States pass through the locks at Sault Ste. Marie, and it is reasonable to suppose that the Algoma Steel Co. can arrange to buy sufficient of that material to provide for their own requirements. So that with a suitable plant and with the same raw materials as United States manufacturers are using, and with the mills under an experienced superintendent, with experienced assistants, there can be no question as to the quality of the rails.

"It may be further added that it is the intention of the Algoma Steel Co. to use a good proportion of charcoal pig iron in their mixtures, as the situation of the furnaces makes this possible. Anyone with a know-

ledge of iron and steel will readily admit that this should mean improvement in the matter of quality as compared with the product of other manufacturers."

A PROFIT SHARING SYSTEM.

The profit sharing system, whereby a premium is placed upon the efficient work of employees by manufacturing and other establishments, and which system is in wide operation in England and the United States, is being adopted by Canadian houses.

An instance of the successful operation of this system is given by the well-known Toronto machinery house of H. W. Petrie. This concern employs about 40 clerks, salesmen, machinists, etc. A year ago Mr. Petrie decided to put into force a profit sharing plan, whereby each employe would derive some benefit from the profits they helped to earn from day to day. The first distribution was made last month, and needless to say the plan has been successful, beyond all expectations. The bonus for each man was based on his salary, that is, his salary is assumed as so much capital in the business, and each and every one, from the manager to the office boy received his share. The employes one and all were much pleased with the result, and the plan has been so satisfactory that it will be continued.

A NEW COAL WASHERY.

The new coal washing plant of the Dominion Iron & Steel Co., Sydney, N.S., just completed is one of the largest and most modern of its kind on the continent. The plant is designed to prepare the coal as it comes from the mines for coking. The coal here mined contains quite a high percentage of sulphur, hence the installation of this new plant to remove considerable of this substance and insure the highest grade of coke for furnace and foundry purposes.

The new plant consists of a washing house and tippie, two breaker buildings and conveying belt galleries. The main building is 240x120 feet, and 100 feet high, built of structural steel and brick on concrete foundations. The two breaker buildings are each 40x25 feet, and 70 feet high, built in the same substantial manner and are located about 60 feet from the ends of the main building. Conveyor galleries connect the different buildings.

The processes of preparing the coal for coking purposes in this modern plant are interesting. Coal for coking purposes is not mined with the same care as coal for other uses. The product is taken as it comes from the mines and is known as "run of mine" coal. It is delivered at the washing plant in small cars and dumped on a rolling table, from which it is fed on a conveyor belt. This belt plays an interesting part in the process of coal washing. It is 30 inches in width and 5-8 of an inch thick and is made of layers of canvas and rubber. With the aid of small iron rollers, about 5 feet apart, on either edge, it is convexed, and, simple as it appears, it conveys the coal, at an angle of about 30 degrees to the top of the

breaker building, at the rate of 100 tons an hour.

The coal is then passed through the feeder which breaks it into small particles. Debris fall through a chute into cars and are taken to the dump.

Such as slate, rocks, etc., pass to one side and the broken coal is now passed into the crusher, where it is ground very fine and runs through a chute to the bottom of a bucket elevator. The buckets take up the coal, discharge it on a 24-inch belt conveyor, which takes it to a storage bin of 700 tons capacity in the upper part of the washing building. In order to keep this bin filled up evenly the conveyor belt runs through an automatic tripper which travels backwards and forwards automatically and drops the coal in a steady stream into all parts of the bin. The bottom of this bin has 24 holes with feed screws and through these the coal is fed into the washer tables. Steady streams of water flow continuously on the washer tables which move to and fro. Particles of refuse that may remain in the coal after leaving the breaker are separated on the washer tables by specific gravity, while the pure or washed coal, and such of the water as is not absorbed flow down a series of chutes into the storage pits. There are six storage pits, each of which has a capacity for holding 1,100 tons of the washed coal. The refuse, separated from the coal on the washer or bumper tables falls down in sluices into the refuse pits, of which there are four.

From the storage pits the washed coal is taken by means of ingeniously arranged travelling cranes and buckets, and placed on

conveying belts. The conveying belts drop it into buckets holding 200 pounds each. The buckets carry it up to an elevator from which it is delivered to the conveyor ready for coking.

The washing plant is in duplicate; so that in case of accident to either, the process of coal washing can go on without interruption. The capacity of the plant in operation is from 1,500 to 2,500 tons a day. The refuse from all sources is about 10 per cent. of the gross quantity of coal delivered from the mines for treatment at the plant.

The plant was designed and erected by Messrs. Heyl & Patterson, Pittsburg, Pa., who are well known throughout the United States in this line of work. A system of heating will be installed in the buildings by The B. F. Sturtevant Co., Hyde Park, Mass. When completed it will be one of the best coal washing plants extant, containing as it will all the latest modern improvements.

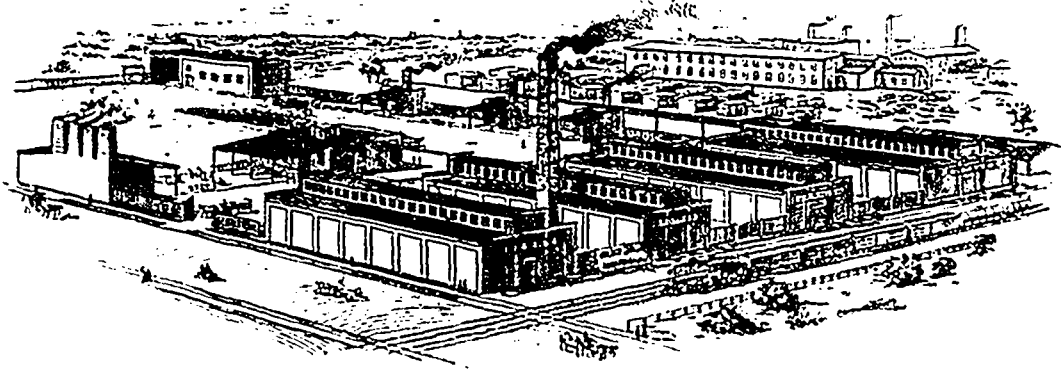
THE EXPOSITION SERVICE PLANT.

The main service plant for the Louisiana Purchase Exposition was installed by the Westinghouse Electric & Mfg. Co., and supplies electric power for general use throughout the Fair Grounds. The entire steam and electric station was designed and installed by Westinghouse, Church, Kerr & Co., and constitutes a model plant of 14,000 h.p. capacity, representative of thoroughly modern practice at minimum cost, such as may be seen in only a few large cities. The four 3,500 h.p. Westinghouse-Corliss vertical cross-compound reciprocating engines within the Westinghouse enclosure at the west end of

Machinery Hall, near the Westinghouse biograph auditorium and the headquarters office of the Westinghouse companies, the smaller engines driving exciters in Machinery Hall, the engines driving pumps, stokers, and cooling tower fans in the service plant section of the Steam, Gas and Fuels Building, or Boiler House, just west of Machinery Hall, and the Roney mechanical stokers in the latter building were manufactured by the Westinghouse Machine Co. The mechanical draft and cooling tower plants were built from special designs. The auxiliary electric apparatus and switchboard equipment was supplied by the Westinghouse Electric & Mfg. Co. The six national booths just north of the engine units in Machinery Hall were designed for the reception of guests of the different Westinghouse companies of the United States, England, Germany, Russia, France, and Canada.

The plant has been in continuous operation since April 15, maintaining its own load, and, from time to time, carrying extra loads which exhibit plants have been unable to sustain. The station records show the exacting character of service rendered, and the number of hours run.

The progress achieved in the manufacture of electric generating units of great capacity has been a very important feature of mechanical and electrical engineering since the time of the World's Columbian Exposition. The great central station at Chicago, in 1893, also a Westinghouse installation, was of about the same total capacity as the present plant, but the twelve Westinghouse generators, although then the largest polyphase alter-



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since we commenced to make Varnish. During this period we have acquired a knowledge not only of Varnish, but of the varied needs of varnish consumers that nothing but time can impart, and have also learned how to cater successfully to every varnish want.

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nating current machines ever constructed, were each of only 750 k.w., or 1,000 h.p. capacity. The twelve generating units of the Chicago plant constituted then the largest polyphase plant in service to-day the four 3,500 h.p. units of the Louisiana Purchase Exposition service plant, although three times as large as the largest at Chicago, are regarded as of only medium size. Indeed, entrance to the service plant is through a full size plaster model of the 35-foot stationary armature of the seventeen 7,000 h.p. Westinghouse generators built for the Manhattan elevated and subway roads, New York City, and eight 7,000 h.p. Westinghouse turbine units are being installed by the British Westinghouse Co., for the main generating stations of the Underground Electric Railways Co., of London. The Westinghouse Electric & Mfg. Co., now have under construction generators for the Ontario Power Co., of 10,000 k.w., or about 13,500 h.p. capacity, and the Westinghouse Machine Co. are building steam turbines in sizes up to 10,000 h.p. While the steam turbine is the most striking example of the space economy of modern prime movers, occupying less than half the floor space necessary for either vertical or horizontal piston engines of equal capacity, with a similar difference in height, it is inter-

esting to note that the floor space occupied by the Westinghouse-Corliss engines and their direct connected generators in the present Exposition service plant, 35x15 feet each, is proportionately only about one-ninth of that required at Chicago for six of the twelve 1,000 h.p. Westinghouse generating units there which were belt driven, each of the latter, with only one-third the capacity of the present units, covering a space 65x27 feet.

The Exposition service plant, although it furnishes the main source of power for the World's greatest fair, and carries all of the commercial operating and lighting load on the grounds and Pike, as well as a large part of the decorative night illumination of the main exhibit buildings, is of interest to engineers not so much for its size as for its completeness, and because it resembles in general design such big Westinghouse installations as the 40,000 h.p. station of the Metropolitan street railway system just completed at Kingsbridge, New York City, or the 75,000 h.p. station of the New York Edison Co., where eleven Westinghouse-Corliss three-cylinder compound engines, rated at 6,500 h.p. each, the largest engines in service, frequently carry a maximum load of 10,000 h.p. for short periods.

BERTRAM ENGINE WORKS CONTRACTS.

The Bertram Engine Works Co., Toronto, have closed a contract with the Keewatin Lumbering & Mfg Co., Keewatin, Ont., for a tug of the following dimensions: Length over all, 95 feet; length from stem to stern post, 86 feet; beam, 19 feet, depth, 10 feet 4 inches; draught, 8 feet 6 inches. She will have a steel frame and a steel deck with oak bottom planking, four steel bulkheads and a steel

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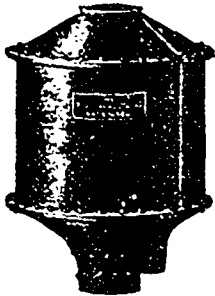
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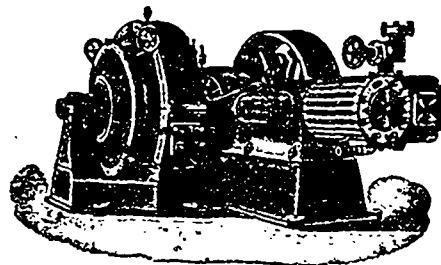
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deck house with quarters for officers. On top will be a steel Texas, a pilot house, and aft below the crew's quarters. The engine will be fore and aft compound condensing 14 and 28 by 20 inches built for a working pressure of 150 pounds and turning a 7-foot cast iron propeller wheel. The boiler will be of the Scotch return tubular type 10 feet in diameter by 12 feet long. This tug will be

built at Toronto, taken apart for shipment and re-erected at Keewatin.


The Bertram Co. are also building the steel hull for a ferry for the St. John, N.B., city council. The steamer is 140 feet over all, 114 feet long from stem to stern post, 34 feet beam, 49 feet over guards and 13 feet deep. She will be built similar to ferry boats on the East and Hudson Rivers at

New York. When ready for shipment it will take 20 cars to transport her to St. John. She will have double propeller with accommodation for passengers on guards and two open wagon roads, one on each side of the centre. The Phoenix Iron Works, St. John, N.B., are building the engines and boilers and will do the carpenter and joiner work.



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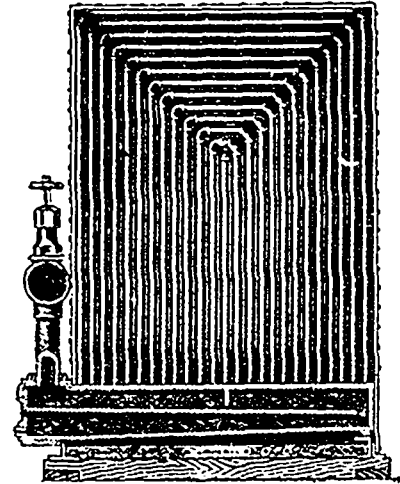
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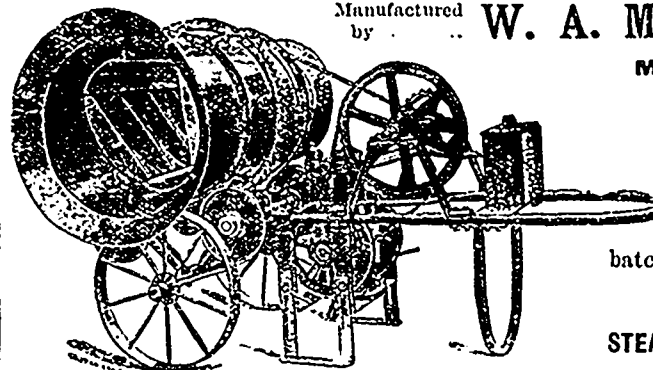
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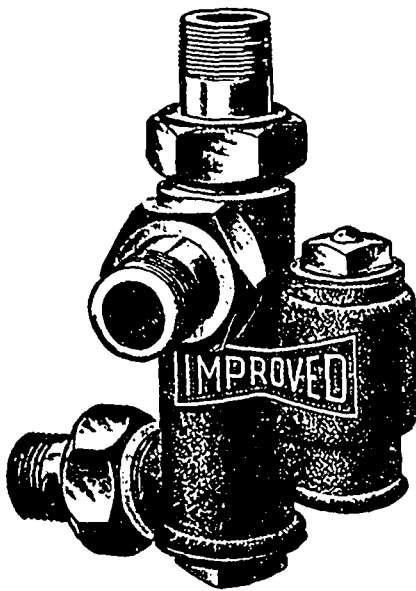
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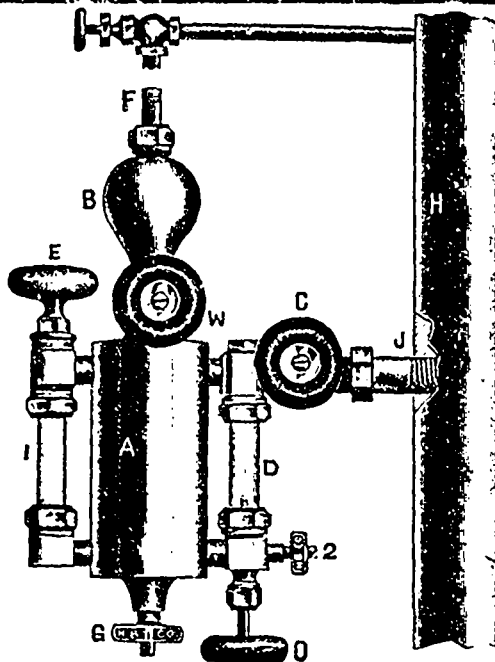
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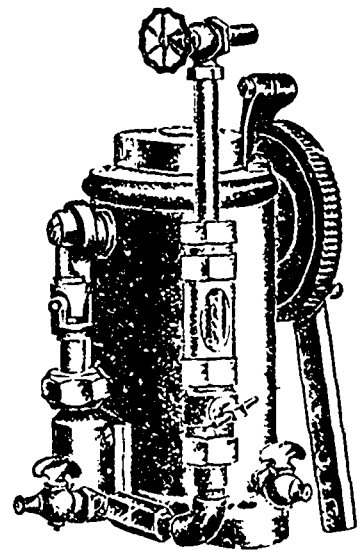
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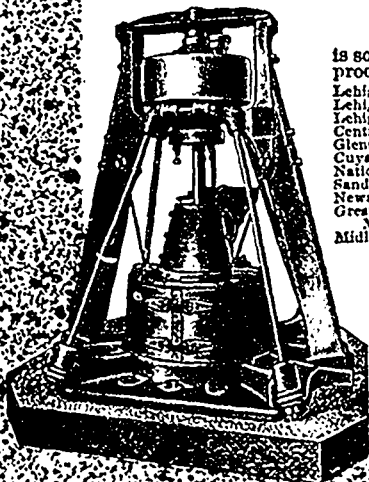


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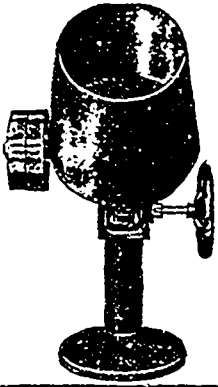
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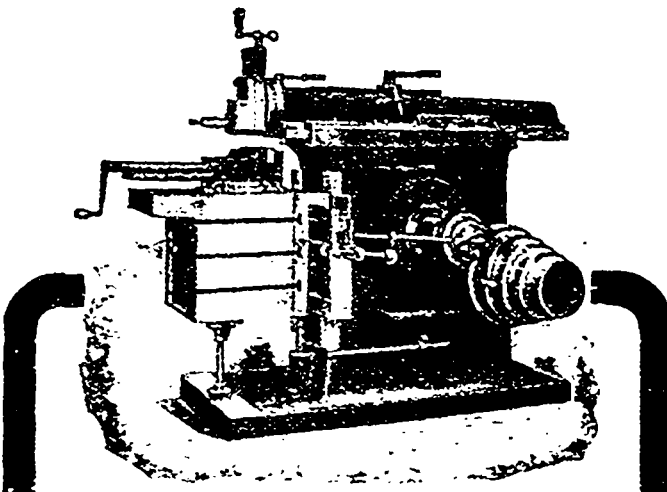
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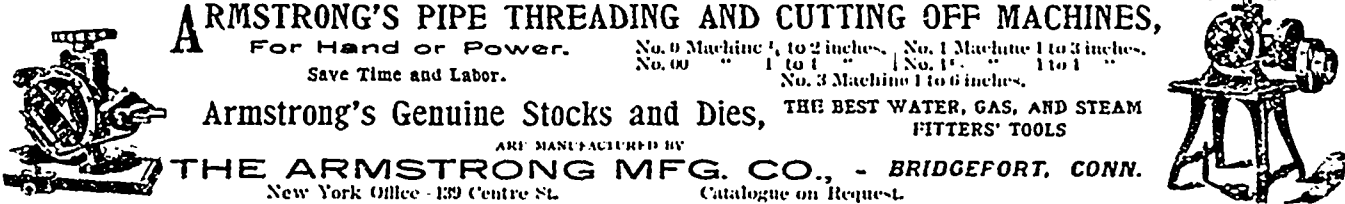
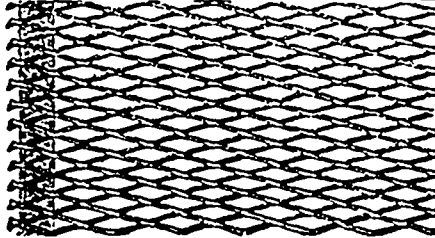
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 For Hand or Power. *Save Time and Labor.*

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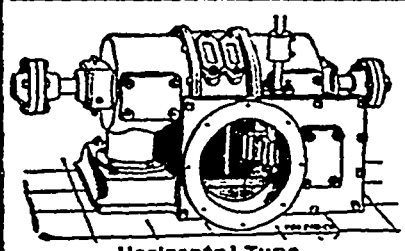
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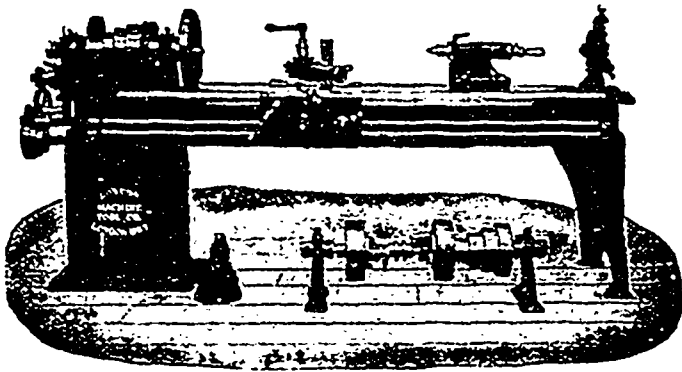
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Canadian Corundum Wheel Co., Hamilton, Ont.
Rice Lewis & Son, Toronto.
Williams, A. R. Machinery Co., Toronto.

Air Compressors

Allis-Chalmers-Bullock, Limited, Montreal.
American Steam Pump Co., Battle Creek, Mich.
Cana Foundry Co., Toronto.
Canadian Rand Drill Co., Sherbrooke, Que.
Corbett & B., Brooklyn, N.Y.
Darling Bros., Montreal.

Aluminum

Northern Aluminum Co., Pittsburg, Pa.
Syracuse Smelting Works, Montreal.

Angles, Beams and Girders

Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Hopkins, F. H. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Aniline Colors and Dyewood Extracts

Bellhouse, Dillon & Co., Montreal.
Benson, W. T. & Co., Montreal.
Brunner, Mond & Co., Northwich, England.
Casella Color Co., New York City.
Geigy Aniline & Extract Co., New York City.
Klinstein, A. & Co., New York City.
McArthur, Cornelle & Co., Montreal.
Winn & Holland, Montreal.

Annealing Muffles and Furnaces (Wire)

Leslie, A. C. & Co., Montreal.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Antimony

Syracuse Smelting Works, Montreal.

Anvils and Vises

Hopkins, F. H. & Co., Montreal.
Leslie, A. C. & Co., Montreal.
Rice Lewis & Son, Toronto.

Architects

Edwards, R. J., Toronto.
Parke, R. J., Toronto.
Vogel, C. H., Ottawa.

Axles

Hopkins, F. H. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Babbitt Metal

Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.
Syracuse Smelting Works, Montreal.

Banks

Bank of Hamilton, Hamilton, Ont.

Bar Iron and Steel

Bourne-Fuller Co., Cleveland, Ohio.
Hopkins, F. H. & Co., Montreal.
Leslie, A. C. & Co., Montreal.
Rice Lewis & Son, Toronto.

Belt Dressing

McLaren, J. C. Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto.
Rossendale Belting Co., Toronto.
Williams, A. R. Machinery Co., Toronto.

Belt Fasteners

Bristol Co., Waterbury, Conn.
McLaren, D. K., Montreal and Toronto.
McLaren, J. C. Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto.
Rossendale Belting Co., Toronto.
Williams, A. R. Machinery Co., Toronto.

Belting (Cotton)

Dominion Belting Co., Hamilton, Ont.
Fleming, W. A. & Co., Montreal.
Greay, Wm. & J. G., Toronto.
McLaren, D. K., Montreal and Toronto.
McLaren, J. C. Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.
Rossendale Belting Co., Toronto.
Wilby, P. H., Toronto, Ont.

Belting (Leather)

Canadian Oak Belting Co., Brockville, Ont.
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Greay, Wm. & J. G., Toronto.
McLaren, D. K., Montreal and Toronto.
McLaren, J. C. Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.
Rice Lewis & Son, Toronto.
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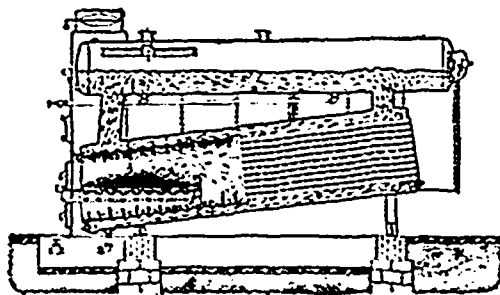
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Bristol Co., Waterbury, Conn.
 Canadian Oak Belting Co., Brockville, Ont.
 Dominion Belting Co., Hamilton, Ont.
 Fleming, W. A. & Co., Montreal.
 Greer, Wm. & J. G., Toronto.
 Gutta Percha & Rubber Mfg. Co., Toronto.
 Jeffrey Mfg. Co., Columbus, Ohio.
 McLaren, D. K., Montreal and Toronto.
 McLaren, J. C. Belting Co., Montreal and Toronto.
 Petrie, H. W., Toronto.
 Pittsburgh Shafting Co., Detroit, Mich.
 Rice Lewis & Son, Toronto.
 Rosendale Belting Co., Toronto.
 Wilby, P. H., Toronto.
 Williams, A. R. Machinery Co., Toronto.

Blast Furnace Brick

Dunbar Fire Brick Co., Pittsburgh, Pa.
 Hamilton Facing Mill Co., Hamilton, Ont.
 Harrison-Walker Refractories Co., Pittsburgh, Pa.
 Pennsylvania Fire Brick Co., Lock Haven, Pa.
 Pittsburgh & Buffalo Co., Buffalo, N.Y.
 Reese-Hammond Fire Brick Co., Bolivar, Pa.
 Stowe-Fuller Co., Cleveland, Ohio.
 Wynn, W. H. & Co., West Deatur, Pa.

Blowers

McEachren Heating & Ventilating Co., Galt, Ont.
 Sheldon & Sheldon, Galt, Ont.
 Sturtevant, B. F. Co., Boston, Mass.

Bobbins

Wilson Bros. Bobbin Co., Liverpool, England.

Boiler Compounds

Lord, Geo. W. Co., Philadelphia, Pa.
 Sleeth, D., Montreal.

Boiler Inspection

Canadian Casualty & Boiler Insurance Co., Toronto.

BOILERS (See Engines and BOLLERS)

Brass Founders

Hamilton Brass Mfg. Co., Hamilton, Ont.
 Meadows, Geo. B. Wire, Iron & Brass Works Co., Toronto.
 McKinnon Dash & Metal Works Co., St. Catharines, Ont.
 Penberthy Injector Co., Windsor, Ont.

Brick and Bricklaying Machinery

Allis-Chalmers-Bullock, Limited, Montreal.

Building Iron and Steel

Bourne-Fuller Co., Cleveland, Ohio.
 Canada Foundry Co., Toronto.
 Expanded Metal & Fireproofing Co., Toronto.

Bulldozers' Materials

Albert Mfg. Co., Hillsboro, Ont.
 Canada Foundry Co., Toronto.
 Canadian Otis Elevator Co., Toronto.
 Canadian Portland Cement Co., Deseronto, Ont.
 Expanded Metal & Fireproofing Co., Toronto.
 Gartsshore, John J., Toronto.
 Hopkins, F. H. & Co., Montreal.
 Meadows, Geo. B. Wire, Iron & Brass Works, Toronto.

Metallie Roofing Co., Toronto.
 Owen Sound Portland Cement Co., Owen Sound, Ont.
 Pittsburgh & Buffalo Co., Buffalo, N.Y.
 Pittsburgh Shafting Co., Detroit, Mich.
 Rice Lewis & Son, Toronto.
 Sheldon & Sheldon, Galt, Ont.

Cables

Dominion Wire Rope Co., Montreal.
 Phillips, Eugene F. Electrical Works, Montreal.
 Wire & Cable Co., Montreal.

Canada Plates

Leslie, A. C. & Co., Montreal.
 Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Canoes

Peterborough Canoe Co., Peterborough, Ont.

Caps

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

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McLaren, D. K., Montreal and Toronto.
 McLaren, J. C. Belting Co., Montreal and Toronto.

Cast Iron Pipe

Canada Foundry Co., Toronto.
 Gartsshore-Thomson Pipe & Foundry Co., Hamilton, Ont.
 Rice Lewis & Son, Toronto.
 Montreal Pipe Foundry Co., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Castings (Iron and Brass)

Bull Malleable Co., Detroit, Mich.
 Greer, Wm. & J. G., Toronto.
 Kerr Engine Co., Walkerville, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Cement Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
 Bradley Pulverizer Co., Boston, Mass.
 Greer, Wm. & J. G., Toronto.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Chain Making Machinery (Welded Coil Chain)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Channels

Bourne-Fuller Co., Cleveland, Ohio.
 Canada Foundry Co., Toronto.
 Leslie, A. C. & Co., Montreal.
 Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Charcoal Pig Iron

Canada Iron Furnace Co., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Chemists

Archbold, Dr. Geo., Prescott, Ont.
 Heys, Thomas & Son, Toronto.

Clay Working Machinery

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Coal and Coke

Alexander, John H., Windsor, Ont.
 Bourne-Fuller Co., Cleveland, Ohio.
 Brownlee, J., Galt, Ont.
 Ferguson, J. D., Hamilton, Ont.
 Hancock, J. M. & Co., Niagara Falls, N.Y.
 Hoffman, Jules G., Detroit, Mich.
 Milnes, James H. & Co., Toronto.
 Ohio & Michigan Coal Co., Detroit, Mich.
 Pittsburgh & Buffalo Co., Buffalo, N.Y.
 Pittsburgh Coal Co., Pittsburgh, Pa.
 Shawmut Coal & Coke Co., St. Mary's, Pa.
 Shepard, Charles G., Buffalo, N.Y.
 Shipman, O. W. Co., Detroit, Mich.
 Wick, H. K. & Co., Buffalo, N.Y.

Coal Cutting Machines

Allis-Chalmers-Bullock, Limited, Montreal.
 Canadian Band Drill Co., Sherbrooke, Que.
 Jeffrey Mfg. Co., Columbus, Ohio.

Coal Triples

Jeffrey Mfg. Co., Columbus, Ohio.

Coal Chains

Greening, B. Wire Co., Hamilton, Ont.
 Leslie, A. C. & Co., Montreal.

Coke Oven Brick

Dunbar Fire Brick Co., Pittsburgh, Pa.
 Stowe-Fuller Co., Cleveland, Ohio.

Collection Agency

Petrie, H. D., Hamilton, Ont.

Concrete Construction

Stevens, A. J., Toronto.

Concrete Mixers

Hopkins, F. H. & Co., Montreal.
 McKelvey, W. A., Toronto.

Contractors' Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
 Carlin's Thomas Sons Co., Allegheny, Pa.
 Gartsshore, John J., Toronto.
 Hopkins, F. H. & Co., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Sinclair, G. S. & Sons, Warton, Ont.

Contractor's Plants

Allis-Chalmers-Bullock, Limited, Montreal.
 Hopkins, F. H. & Co., Montreal.
 Petrie, H. W., Toronto.
 Von Jer Osten, E. & Co., Toronto.
 Williams, A. R. Machinery Co., Toronto.

Conveying Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
 Babcock & Wilcox, Limited, Montreal.
 Borden & Selleck Co., Chicago, Ill.
 Bull Malleable Co., Detroit, Mich.
 Canada Foundry Co., Toronto.
 Dodge Mfg. Co., Toronto.
 Greer, Wm. & J. G., Toronto.
 Jeffrey Mfg. Co., Columbus, Ohio.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Perrin, William R. & Co., Limited, Toronto.
 Pittsburg Shafting Co., Detroit, Mich.
 Rosendale Belting Co., Toronto.

Copper Materials

Greening, B. Wire Co., Hamilton, Ont.
 Phillips, Eugene F. Electrical Works, Montreal.
 Syracuse Smelting Works, Montreal.
 Wire & Cable Co., Montreal.

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 Rice Lewis & Son, Toronto.

Covers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.
 Pittsburg Crucible Works, Pittsburg, Pa.

Craysons

Lowell Crayon Co., Lowell, Mass.

Crucibles

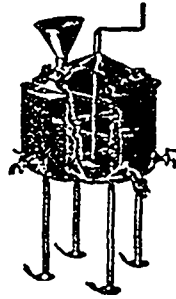
Dixon, Joseph, Crucible Co., Jersey City, N.Y.
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 Pittsburg Crucible Works, Pittsburg, Pa.

Dies (Socket, Sewer Pipe and Tile)
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 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

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 Allis-Chalmers-Bullock, Limited, Montreal.
 Canadian Westinghouse Co., Ltd., Hamilton, Ont.
 London Machine Tool Co., London, Ont.
 Petrie, H. W., Toronto.
 Pittsburgh Shafting Co., Detroit, Mich.

Drills (Pneumatic and Rock)
 Allis-Chalmers-Bullock, Limited, Montreal.
 Canadian Hand Drill Co., Sherbrooke, Que.
 Jeffrey Mfg. Co., Columbus, Ohio.

Drills (Twist)
 Cleveland Twist Drill Co., Cleveland, Ohio.
 Pittsburg Shafting Co., Detroit, Mich.

Drop Forgings
 Globe Machine & Stamping Co., Cleveland, Ohio.

Drop Forging Dies
 Globe Machine & Stamping Co., Cleveland, Ohio.

Dry Kiln Apparatus

Sheldon & Sheldon, Galt, Ont.
 Sturtevant, B. F. Co., Boston, Mass.

Dust and Shavings Separators
 Sheldon & Sheldon, Galt, Ont.
 Sturtevant, B. F. Co., Boston, Mass.

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 Bellhouse, Dillon & Co., Montreal.
 Benson, W. T. & Co., Montreal.
 Brunner, Mond & Co., Northwich, England.
 Casella Color Co., New York City.
 Geigy Aniline & Extract Co., New York City.
 Klipstein, A. & Co., New York City.
 McArthur, Cornelle & Co., Montreal.
 Winn & Holland, Montreal.

DYNAMOS (See Motors and Dynamos)

Electric Meters and Transformers
 Allis-Chalmers-Bullock, Limited, Montreal.
 Packard Electric Co., St. Catharines, Ont.

Electric Mine Locomotives
 Canadian General Electric Co., Toronto.
 Canadian Westinghouse Co., Ltd., Hamilton, Ont.
 Jeffrey Mfg. Co., Columbus, Ohio.

Electrical Repairs
 Volta Electric Repair Works, Toronto.

Electrical Supplies
 Allis-Chalmers-Bullock, Limited, Montreal.
 Bristol Co., Waterbury, Conn.
 Canadian General Electric Co., Toronto.
 Canadian Westinghouse Co., Ltd., Hamilton, Ont.
 Electrical Construction Co., London, Ont.
 Forman, John, Montreal.
 Jones & Moore Electric Co., Toronto.
 Packard Electric Co., St. Catharines, Ont.
 Toronto & Hamilton Electric Co., Hamilton, Ont.
 United Electric Co., Toronto.
 Worth & Martin, Toronto.

Elevators and Conveyors
 Allis-Chalmers-Bullock, Limited, Montreal.
 Buhl Malleable Co., Detroit, Mich.
 Canadian Otis Elevator Co., Toronto.
 Greyc, Wm. & J. G., Toronto.
 Darling Bros., Montreal.
 Jeffrey Mfg. Co., Columbus, Ohio.

Elevator Insurance
 Canadian Casualty & Boiler Insurance Co., Toronto.

Emery and Emery Wheels
 Canadian Corundum Wheel Co., Hamilton, Ont.
 Forman, John, Montreal.
 Petrie, H. W., Toronto.

Emery Grinders
 Robertson Mfg. Co., Buffalo, N.Y. and Bridgeburg, Ont.

Engineers (Chemical)
 Heys, Thomas & Son, Toronto.
 Hunt, Robert W. & Co., Chicago, Ill.

Engineers (Civil)
 Delano-Osborn Engineering Co., Toronto.
 Kelsch, R. S., Montreal.
 Parke, R. J., Toronto.
 Vogel, C. H., Ottawa.

Engineers (Consulting)
 Delano-Osborn Engineering Co., Toronto.
 Electrical Construction Co., London, Ont.
 Electrical Supervision Society, Toronto.
 Hunt, Robert W. & Co., Chicago, Ill.

Kelsch, R. S., Montreal.
 Marion & Marion, Montreal.
 Parke, R. J., Toronto.
 Perrin, William R. & Co., Limited, Toronto.
 Simpson, T. F., Deschenes, Que.
 Vogel, C. H., Ottawa.
 Volta Electric Repair Works, Toronto.
 Von der Osten, E. & Co., Toronto.

Engineers (Contracting)
 Babcock & Wilcox, Limited, Montreal.
 Canada Foundry Co., Toronto.
 Darling Bros., Montreal.
 Electrical Construction Co., London, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Robb Engineering Co., Amherst, N.S.

Engineers (Electrical)
 Allis-Chalmers-Bullock, Limited, Montreal.
 Canadian General Electric Co., Toronto.
 Canadian Westinghouse Co., Ltd., Hamilton, Ont.
 Delano-Osborn Engineering Co., Toronto.
 Electric Engineering & Supply Co., Montreal.
 Electrical Construction Co., London, Ont.
 Electrical Supervision Society, Toronto.
 Kelsch, R. S., Montreal.
 Jones & Moore Electric Co., Toronto.
 Marion & Marion, Montreal.
 Toronto & Hamilton Electric Co., Hamilton, Ont.
 United Electric Co., Toronto.
 Volta Electric Repair Works, Toronto.
 Worth & Martin, Toronto.

Engineers (Mechanical)
 Allis-Chalmers-Bullock, Limited, Montreal.
 Babcock & Wilcox, Limited, Montreal.
 Borden & Selleck Co., Chicago, Ill.
 Buhl Malleable Co., Detroit, Mich.
 Darling Bros., Montreal.
 Delano-Osborn Engineering Co., Toronto.
 Electrical Construction Co., London, Ont.
 Greyc, Wm. & J. G., Toronto.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Hunt, Robert W. & Co., Chicago, Ill.

Engineers (Mill and Hydraulic)
 Buhl Malleable Co., Detroit, Mich.
 Delano-Osborn Engineering Co., Toronto.
 Vogel, C. H., Ottawa.

Engineers (Mining)
 Buhl Malleable Co., Detroit, Mich.
 Heys, Thomas & Son, Toronto.
 Mills, S. D., Toronto.

Engineers (Municipal)
 Von der Osten, E. & Co., Toronto.

Engineers and Contractors
 Buhl Malleable Co., Detroit, Mich.
 Jeffrey Mfg. Co., Columbus, Ohio.

Engines and Boilers
 Allis-Chalmers-Bullock, Limited, Montreal.
 Babcock & Wilcox, Limited, Montreal.
 Bertram Engine Works Co., Toronto.
 Canada Foundry Co., Toronto.
 Canadian Heine Safety Boiler Co., Toronto.
 Corbett, R. B., Brooklyn, N.Y.
 Goldie & McCullough Co., Galt, Ont.
 Hamilton, Wm. Mfg. Co., Peterborough, Ont.
 Hopkins, F. H. & Co., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 McEachern Heating & Ventilating Co., Galt, Ont.
 Petrie, H. W., Toronto.
 Petroleum Iron Works Co., Washington, Pa.
 Pittsburgh Shafting Co., Detroit, Mich.
 Robb Engineering Co., Amherst, N.S.
 Sheldon & Sheldon, Galt, Ont.
 Sturtevant, B. F. Co., Boston, Mass.
 Williams, A. R. Machinery Co., Toronto.

Engravers
 Canadian Manufacturer, Toronto.
 Jones, J. L., Engraving Co., Toronto.

Exhaust Fans
 Sheldon & Sheldon, Galt, Ont.
 Sturtevant, B. F. Co., Boston, Mass.

Exhaust Heads
 Burt Mfg. Co., Akron, Ohio.
 Darling Bros., Montreal.

Factory Sites
 Central Ontario Power Co., Peterboro, Ont.

Feed Water Heaters
 Babcock & Wilcox, Limited, Montreal.
 Darling Bros., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Petroleum Iron Works Co., Washington, Pa.

Files
 Spence, R. & Co., Hamilton, Ont.

Financial
 Bradstreet's, New York City.
 Dun, R. G. & Co., Toronto.
 Neff & Postlethwaite, Toronto.
 Petrie, H. D., Hamilton, Ont.

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(CONTINUED).

Filters (Oil)

Babeck & Wilcox, Limited, Montreal.
Burt Mfg. Co., Akron, Ohio.
Darling Bros., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Perrin, William R. & Co., Limited, Toronto.

Filters and Filtering Systems (Water)

Babeck & Wilcox, Limited, Montreal.
McDougall John, Caledonian Iron Works Co., Montreal.

Fire Brick and Clay

Dunbar Fire Brick Co., Pittsburg, Pa.
Hamilton Facing Mill Co., Hamilton, Ont.
Habrisson-Walker Refractories Co., Pittsburg, Pa.
Pennsylvania Fire Brick Co., Lock Haven.
Pittsburgh & Buffalo Co., Buffalo, N.Y.
Reese-Hammond Fire Brick Co., Bolivar, Pa.
Scioto Fire Brick Co., Sciotoville, Ohio.
Stowe-Fuller Co., Cleveland, Ohio.
Wynn, W. H. & Co., West Decatur, Pa.

Fire Escapes

Darling Bros., Montreal.
Meadows, Geo. B., Wire, Iron & Brass Works, Toronto.

Flour Mill Machinery

Goldie & McCulloch Co., Galt, Ont.
Greay, Wm. & J. G., Toronto.

Forges and Blowers

Canada Foundry Co., Toronto.
McEachren Heating & Ventilating Co., Galt, Ont.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Founders

Canada Foundry Co., Toronto.
Cowan & Co., Galt, Ont.
Gartshore-Thomson Pipe & Foundry Co., Hamilton, Ont.

Goldie & McCulloch Co., Galt, Ont.
Greay, Wm. & J. G., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.

Sinclair, G. S. & Sons, Warton, Ont.

Foundry Facings and Supplies

Hamilton Facing Mill Co., Hamilton, Ont.

Fuel Economizers

Babeck & Wilcox, Limited, Montreal.
Sturtevant, B. F. Co., Hyde Park, Mass.

Furniture (Lodge, Opera and School)

Canadian Office & School Furniture Co., Preston, Ont.

Galvanizing

Ontario Wind Engine & Pump Co., Toronto.

Galvanizing and Tinning Machinery and Furnaces (Wire)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Gas and Gasoline Engines

Goldie & McCulloch Co., Galt, Ont.
Morrison, T. A. & Co., Montreal.
Robertson Mfg. Co., Buffalo, N.Y. and Bridgeburg, Ont.

Gauges (Recording Pressure)

Bristol Co., Waterbury, Conn.

Gauges (Steam)

American Steam Pump Co., Battle Creek, Mich.
Penberthy Injector Co., Windsor, Ont.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Gauges (Water)

Babeck & Wilcox, Limited, Montreal.

Penberthy Injector Co., Windsor, Ont.

Generators

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Phillips, Eugene F., Electrical Works, Montreal.
Toronto & Hamilton Electric Co., Hamilton, Ont.
Volta Electric Repair Works, Toronto.

Gloves, Mittens and Moccasins

Storey, W. H. & Son, Acton, Ont.

Glue Heaters

Advance Machinery Co., Toledo, Ohio.
Greay, Wm. & J. G., Toronto.

Glue Room Equipment

Advance Machinery Co., Toledo, Ohio.

Government Notices

Factory Inspectors,
Minister of Agriculture.

Graphite

Dixon, Jos., Crucible Co., Jersey City, N.J.
McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.

Grease Cups

Penberthy Injector Co., Windsor, Ont.

Grinding Machinery

Canadian Corundum Wheel Co., Hamilton, Ont.
Greay, Wm. & J. G., Toronto.

Grinding Pans

Carlin's, Thomas Sons Co., Allegheny, Pa.

Hardware

Butterfield & Co., Rock Island, Que.
Cleveland Twist Drill Co., Cleveland, Ohio.
Gartshore, John J., Toronto.
Globe Machine & Stamping Co., Cleveland, Ohio.
Hopkins, F. H. & Co., Montreal.
Morrow, John, Machine Screw Co., Ingersoll, Ont.
Rice Lewis & Son, Toronto.
Ryall Machine Screw Co., Montreal.
Stanyon Metallic Furniture Co., Toronto.

Heating and Ventilating Apparatus

Darling Bros., Montreal.
McEachren Heating & Ventilating Co., Galt, Ont.
Sheldon & Sheldon, Galt, Ont.
Stevens, Alfred J., Toronto.
Sturtevant, B. F. Co., Boston, Mass.

Holting Engines

Bertram Engine Works Co., Toronto.

Holsts (Chain and Pneumatic)

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Rand Drill Co., Sherbrooke, Que.
Hopkins, F. H. & Co., Montreal.

Hose (Fire and Pneumatic)

Gutta Percha & Rubber Mfg. Co., Toronto.
McLaren, J. C., Belting Co., Montreal and Toronto.

Hydrants

Kerr Engine Co., Walkerville, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.

Hydraulic Accumulators

McDougall, John, Caledonian Iron Works Co., Montreal.

Hydraulic Machinery

Canada Foundry Co., Toronto.
Darling Bros., Montreal.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.

Perrin, William R. & Co., Limited, Toronto

Petrie, H. W., Toronto.

Wilson, J. C. & Co., Glenora, Ont.

Industrial Plants

Von der Osten, E. & Co., Toronto.

Insulated Wires and Cables

Phillips, Eugene F., Electrical Works, Montreal.
Wire & Cable Co., Montreal.

Iron and Steel Specialties

Abbott, William, Montreal.
Armstrong Mfg. Co., Bridgeport, Conn.
Bailey-Underwood Co., New Glasgow, N. S.
Bourne-Fuller Co., Cleveland, Ohio.
Brown & Co., Paris, Ont.
Bull Malleable Co., Detroit, Mich.
Canada Foundry Co., Toronto.
Cleveland Twist Drill Co., Cleveland, Ohio.
Leslie, A. C. & Co., Montreal.
Lysaght, John, Limited, Bristol, England and Montreal.

Meadows, Geo. B., Wire, Iron & Brass Works Co., Toronto.

Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Petrie, H. W., Toronto.

Petroleum Iron Works Co., Washington, Pa.

Pittsburgh Shafting Co., Detroit, Mich.

Rice Lewis & Son, Toronto.

Ryall Machine Screw Co., Montreal.

Sinclair, G. S. & Sons, Warton, Ont.

Injectors

Canada Foundry Co., Toronto.

Hamilton Brass Mfg. Co., Hamilton, Ont.

Penberthy Injector Co., Windsor, Ont.

Williams, A. R. Machinery Co., Toronto.

Iron and Steel Inspection

Hunt, R. W. & Co., Chicago, Ill.

Lamps—Electric

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Forman, John, Montreal.
Packard Electric Co., St. Catharines, Ont.
Sunbeam Incandescent Lamp Co., Toronto and St. Catharines, Ont.

Lathes

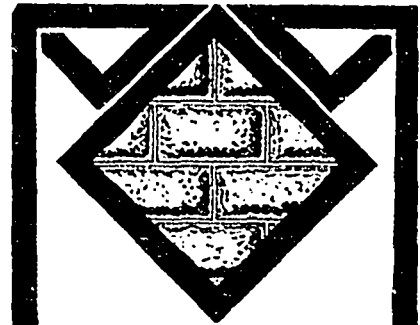
Cowdrey, C. H. Machine Works, Fitchburg, Mass.
London Machine Tool Co., London, Ont.
Petrie, H. W., Toronto.
Williams, A. R. & Co., Toronto.

Lathes (Wood-working)

Cowan & Son, Galt, Ont.
Goldie & McCulloch Co., Galt, Ont.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Lubricators

Penberthy Injector Co., Windsor, Ont.



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London, Ont.	Montreal, Que.
Ottawa, Ont.	Quebec, Que.
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Vancouver, B.C.	Winnipeg, Man.

THOMAS C. IRVING, Gen'l Manager Western Canada
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Machinists

Bertram Engine Works Co., Toronto.
Buhl Malleable Co., Detroit, Mich.
Goldie & McCullough Co., Galt, Ont.
Greay, Wm. & J. G., Toronto.
London Machine Tool Co., London, Ont.
Worth & Martin, Toronto.

Machinists' Supplies

Armstrong Mfg. Co., Bridgeport, Conn.
Buhl Malleable Co., Detroit, Mich.
Butterfield & Co., Rock Island, Que.
Cleveland Twist Drill Co., Cleveland, Ohio.
Goldie & McCullough Co., Galt, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hopkins, F. H. & Co., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
London Machine Tool Co., London, Ont.
Morrow, John, Machine Screw Co., Ingersoll, Ont.
Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.
Robertson Mfg. Co., Buffalo, N.Y. and Bridgeburg, Ont.
Ryall Machine Screw Co., Montreal.
Sinclair, G. S. & Sons, Warton, Ont.
Worth & Martin, Toronto.

Machine Tools

Abbott, William, Montreal.
Bertram, John & Sons Co., Dundas, Ont.
Cleveland Twist Drill Co., Cleveland, Ohio.
Cowdry, C. H. Machine Works, Fitchburg, Mass.
Darling Bros., Montreal.
London Machine Tool Co., London, Ont.
Petrie, H. W., Toronto.
Robertson Mfg. Co., Buffalo, N.Y. and Bridgeburg, Ont.

Machinery Repairs

Bertram Engine Works Co., Toronto.
Greay, Wm. & J. G., Toronto.

Malleable Iron Castings

Buhl Malleable Co., Detroit, Mich.
McKinnon Dash & Metal Works, Co., St. Catharines, Ont.
Smith's Falls Malleable Castings Co., Smith's Falls, Ont.

Marine and Stationary Engines and Boilers

Allis-Chalmers-Bullock, Limited, Montreal.
Bertram Engine Works Co., Toronto.

Mechanical Draft

Babeock & Wilcox, Limited, Montreal.
McEchren Heating & Ventilating Co., Galt, Ont.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Metal Stamping

Globe Machine & Stamping Co., Cleveland, Ohio.
Stanyon Metallic Furniture Co., Toronto.

Metallurgists

Mills, S. D., Toronto.

Mill Machinery and Supplies

Allis-Chalmers-Bullock, Limited, Montreal.
Armstrong Mfg. Co., Bridgeport, Conn.
Buhl Malleable Co., Detroit, Mich.
Cleveland Twist Drill Co., Cleveland, Ohio.
Cowan & Co., Galt, Ont.
Darling Bros., Montreal.
Fleming, W. A. & Co., Montreal.
Gartshore, John J., Toronto.
Goldie & McCullough Co., Galt, Ont.
Greay, Wm. & J. G., Toronto.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hamilton Brass Mfg. Co., Hamilton, Ont.
Hamilton, Wm., Mfg. Co., Peterborough, Ont.
Hay, Peter Knife Co., Galt, Ont.
Hopkins, F. H. & Co., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
London Machine Tool Co., London, Ont.
Morrow, John, Machine Screw Co., Ingersoll, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.

McLaren, D. K., Montreal and Toronto.

Penberthy Injector Co., Windsor, Ont.
Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.
Rice Lewis & Son, Toronto.
Robb Engineering Co., Amherst, N.S.
Robertson Mfg. Co., Buffalo, N.Y. and Bridgeburg, Ont.

Ryall Machine Screw Co., Montreal.

Sinclair, G. S. & Sons, Warton, Ont.
Snecce, R. & Co., Hamilton, Ont.
Wilson, J. C. & Co., Glenora, Ont.

Miners' Lamps

Allis-Chalmers-Bullock, Limited, Montreal.
Anton, John & Son, Monongahela, Pa.

Mining Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Buhl Malleable Co., Detroit, Mich.
Canadian Rand Drill Co., Sherbrooke, Que.
Cleveland Twist Drill Co., Cleveland, Ohio.
Corbett, R. B., Brooklyn, N.Y.
Gartshore, John J., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Hopkins, F. H. & Co., Montreal.

Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co., Montreal.
Perrin, William R. & Co., Limited, Toronto.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Motors and Dynamos

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Corbett, R. B., Brooklyn, N.Y.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Petrie, H. W., Toronto.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Volta Electric Repair Works, Toronto.

Moulding Sand

Hamilton Facing Mills Co., Hamilton, Ont.

Novelty Manufacturers

Worth & Martin, Toronto.

Nozzles

McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.

Office and Bank Fittings

Canadian Office & School Furniture Co., Preston, Ont.
Meadows, Geo. B., Wire, Iron & Brass Works Co., Toronto.

Oils and Lubricants

Dixon, Jos., Crucible Co., Jersey City, N.J.
Fleming, W. A. & Co., Montreal.
Hart & Co., Chicago, Ill.
Imperial Oil Co., Petrolia, Ont.
Queen City Oil Co., Toronto.

Oil Cloth

Dominion Oil Cloth Co., Montreal.

Oil Cups

Penberthy Injector Co., Windsor, Ont.

Paints and Colors

Bellhouse, Dillon & Co., Montreal.
Fleming, W. A. & Co., Montreal.
Geigy, Aniline & Extract Co., New York City.
Klipstein, A. & Co., New York City.
McArthur, Cornelia & Co., Montreal.

Paper Manufacturers

Barber, Wm., & Bros., Georgetown, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Patents

Budden, Hanbury, A., Montreal.
Case, Egerton R., Toronto.
Fetherstonhaugh & Co., Toronto.
Marion & Marion, Montreal.

Perforated Metals

Globe Machine & Stamping Co., Cleveland, Ohio.
Greening, B. Wire Co., Hamilton, Ont.
Stanyon Metallic Furniture Co., Toronto.

Personal Accident

Canadian Casualty & Boiler Insurance Co., Toronto

Phosphorizers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.

Pig Iron

Bourne-Fuller Co., Cleveland, Ohio.
Canada Iron Furnace Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Shepard, Charles G., Buffalo, N.Y.
Syracuse Smelting Works, Montreal.

Pipe (Riveted, Iron and Steel)

Babeock & Wilcox, Limited, Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Petroleum Iron Works Co., Washington, Pa.

Pipe Threading Machines

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que.
Petrie, H. W., Toronto.
Rice Lewis & Son, Toronto.

Pipes and Tubes

Abbott, William, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Corbett, R. B., Brooklyn, N.Y.
Gartshore-Thomson Pipe & Foundry Co., Hamilton, Ont.
Montreal Pipe Foundry Co., Montreal.
Rice Lewis & Son, Toronto.

Plaster

Albert Mfg. Co., Hillsborough, N.B.

Plates

Bourne-Fuller Co., Cleveland, Ohio.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Rice Lewis & Son, Toronto.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

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Plumbago

Hamilton Facing Mills Co., Hamilton, Ont.
McCallough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.

Pneumatic Tools

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Rand Drill Co., Sherbrooke, Que.

Pointer Rolls (For Rods and Wire)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Portland Cement

Canadian Portland Cement Co., Deseronto, Ont.
Owen Sound Portland Cement Co., Owen Sound, Ont.
Hathbin Co., Toronto.
St. Lawrence Portland Cement Co., Montreal.

Power Plants—Equipments

Allis-Chalmers-Bullock, Limited, Montreal.
Babeock & Wilcox, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Cleveland Twist Drill Co., Cleveland, Ohio.
Corbett, R. B., Brooklyn, N.Y.
Darling Bros., Montreal.
Deland-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Goldie & McCullough, Galt, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Kelsch, R. S., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Packard Electric Co., St. Catharines, Ont.
Perrin, William R. & Co., Limited, Toronto.
Petrie, H. W., Toronto.
Phillips, Eugene F., Electrical Works, Montreal.
Pittsburgh Shafting Co., Detroit, Mich.
Robb Engineering Co., Amherst, N.S.
Sinclair, G. S. & Sons, Warton, Ont.
Sturtevant, B. F. Co., Boston, Mass.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Wilson, J. C. & Co., Glenora, Ont.

Presses (Tile, Sewer Pipe, Nozzles and Sleeves)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Pulleys

Darling Bros., Montreal.
Goldie & McCullough Co., Galt, Ont.
Greay, Wm. & J. G., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co., Montreal.
McLaren, J. C., Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.
Wilson, J. C. & Co., Glenora, Ont.

Pumps and Pumping Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Canada Foundry Co., Toronto.
Corbett, R. B., Brooklyn, N.Y.
Darling Bros., Montreal.
Downie Pump Co., Downieville, Pa.
Goldie & McCullough Co., Galt, Ont.
Kerr Engine Co., Walkerville, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
Ontario Wind Engine & Pump Co., Toronto.
Petrie, H. W., Toronto.

Punches and Shears

Globe Machine & Stamping Co., Cleveland, Ohio.
Petrie, H. W., Toronto.

Purifiers

Babeock & Wilcox, Limited, Montreal.
Goldie & McCullough Co., Galt, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.

Purifying and Softening Systems (Water)

Babeock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.

Railroads

Chicago & North-Western Ry., Toronto & St. Paul, Minn.
Quebec Central Railway, Sherbrooke, Que.

Railway Supplies

Algoma Steel Co., Sault Ste. Marie, Ont.
Allis-Chalmers-Bullock, Limited, Montreal.
Garshore, John J., Toronto.
Greening, B. Wire Co., Hamilton, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hopkins, F. H. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Phillips, Eugene F., Electrical Works, Montreal.

Beamers

Butterfield & Co., Rock Island, Que.
Cleveland Twist Drill Co., Cleveland, Ohio.

Rivets

Bourne-Fuller Co., Cleveland, Ohio

Rock and Ore Crushers

Allis-Chalmers-Bullock, Limited, Montreal.
Bradley Pulverizer Co., Boston, Mass.

Roller Bearings

Pittsburg Shafting Co., Detroit, Mich.

Rolling Mill Engineers

Bourne-Fuller Co., Cleveland, Ohio.

Roofing

Bourne-Fuller Co., Cleveland, Ohio.
Metallic Roofing Co., Toronto.

Rubber Goods

Gutta Percha & Rubber Mfg. Co., Toronto.
Pittsburg Shafting Co., Detroit, Mich.

Rubber Packing

Gutta Percha & Rubber Mfg. Co., Toronto.

Rubber Washing Tubs

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Rural Mail Boxes

Globe Machine & Stamping Co., Cleveland, Ohio.

Safes and Vaults

Goldie & McCullough Co., Galt, Ont.

Screws

Morrow, John, Machine Screw Co., Ingersoll, Ont.
Ryall Machine Screw Co., Montreal.

Screw Plates

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que.

Sewer Pipe

Pittsburgh & Buffalo Co., Buffalo, N.Y.

Shafting

Allis-Chalmers-Bullock, Limited, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Goldie & McCullough Co., Galt, Ont.
Greay, Wm. & J. G., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.

Shafting Coupler

Sinclair, G. S. & Sons, Warton, Ont.

Shapers and Carvers

Advance Machinery Co., Toledo, Ohio.

Shear Knives

Carlin's, Thomas Sons Co., Allegheny, Pa.
Hay, Peter Knife Co., Galt, Ont.

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Abbott, William, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Leslie, A. C. & Co., Montreal.
Lysaght, John, Limited, Bristol, England and Montreal.

Sheet Metal Goods

Globe Machine & Stamping Co., Cleveland, Ohio.
Metallic Roofing Co., Toronto.
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Metallic Roofing Co., Toronto.
Ryall Machine Screw Works, Montreal.
Stanyon Metallic Furniture Co., Toronto.

Ship Builders

Bertram Engine Works Co., Toronto.
Ramage, Edward, Toronto.

Smoke Stacks

Hamilton, Wm. Mfg. Co., Peterborough, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
Petroleum Iron Works Co., Washington, Pa.

Solder

Globe Machine & Stamping Co., Cleveland, Ohio.
Syracuse Smelting Co., Montreal.

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Hamilton Stamp & Stencil Works, Hamilton, Ont.
Stanyon Metallic Furniture Co., Toronto.

Steam Pumps
Allis-Chalmers-Bullock, Limited, Montreal.
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Canada Foundry Co., Toronto.
Darling Bros., Montreal.
Goldie & McCullough Co., Galt, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.

Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.
Williams, A. R. Machinery Co., Toronto.

Steam Separators
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Darling Bros., Montreal.
McEachren Heating & Ventilating Co., Galt, Ont.

Steam Specialties
Darling Bros., Montreal.
McEachren Heating & Ventilating Co., Galt, Ont.
Pemberthy Injector Co., Windsor, Ont.
Sheldon & Sheldon, Galt, Ont.

Steam Valves
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Darling Bros., Montreal.
Kerr, Engine Co., Walkerville, Ont.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Steel and Composite Ships
Bertram Engine Works Co., Toronto.

Steel Rails
Algoma Steel Co., Sault Ste. Marie, Ont.
Drummond, McCall & Co., Montreal and Toronto.
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Steel Shafting
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Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Pittsburg Shafting Co., Detroit, Mich.
Wilson, J. C. & Co., Glenora, Ont.

Stocks and Dies
Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que.
Petrie, H. W., Toronto.
Rice Lewis & Son, Toronto.
Worth & Martin, Toronto.

Stoppers
McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.

Structural Steel
Abbott, William, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Hopkins, F. H. & Co., Montreal.

Suspension Furnaces
Continental Iron Works Co., New York City.

Tanks (Oil and Water)
Canada Foundry Co., Toronto.
Corbett, R. B., Brooklyn, N.Y.
Goldie & McCullough Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
Ontario Wind Engine & Pump Co., Toronto.
Petroleum Iron Works Co., Washington, Pa.

Taps and Dies
Butterfield & Co., Rock Island, Que.
Cleveland Twist Drill Co., Cleveland, Ohio.
Globe Machine & Stamping Co., Cleveland, Ohio.
Hamilton Stamp & Stencil Works, Hamilton, Ont.

Tees
Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.

Textile Manufacturers
Dominion Oil Cloth Co., Montreal.
Smith Mfg. Co., Toronto.
Storey, W. H. & Sons, Acton, Ont.

Textile Supplies
Greyc, Wm. & J. G., Toronto.
McLaren, J. C. Belting Co., Montreal and Toronto.

Thermometers (Recording)
Bristol Co., Waterbury, Conn.

Tin
Leslie, A. C. & Co., Montreal.
Syracuse Smelting Works, Montreal.

Tool Steel
Abbott, William, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Hopkins, F. H. & Co., Montreal.
Leslie, A. C. & Co., Montreal.

Trucks
Corbett, R. B., Brooklyn, N.Y.
Greyc, Wm. & J. G., Toronto.
Hopkins, F. H. & Co., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Sheldon & Sheldon, Galt, Ont.

Trucks (Railway)
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Trucks (Wire Mill Supplies)
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Tubs (Cleaning and Coating Wire)
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Tugs
Bertram Engine Works Co., Toronto.

Tumbling Barrels
Globe Machine & Stamping Co., Cleveland, Ohio.

Turbines
Canada Foundry Co., Toronto.
Greyc, Wm. & J. G., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Wilson, J. C. & Co., Glenora, Ont.

Typewriters and Supplies
United Typewriter Co., Toronto.

Valves
American Steam Pump Co., Battle Creek, Mich.
Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Hamilton Brass Mfg. Co., Hamilton, Ont.
Kerr Engine Co., Walkerville, Ont.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Valves (Rubber)
Gutta Percha & Rubber Mfg. Co., Toronto.

Varnishes
Berry Bros., Walkerville, Ont.

Ventilators
Darling Bros., Montreal.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Wagon and Carriage Wood Work
Hore, F. W. & Son, Hamilton, Ont.

Washers or Rollinders (Cleaning Rubber)
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

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Lord, Geo. W. Co., Philadelphia, Pa.
Sleeth, D., Montreal.

Windmills
Ontario Wind Engine & Pump Co., Toronto.

Wire Mill Supplies
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Wire and Wire Rope
Dominion Wire Rope Co., Montreal.
Greening, B. Wire Co., Hamilton, Ont.
Leslie, A. C. & Co., Montreal.
Phillips, Eugene F. Electrical Works, Montreal.
Pittsburg Shafting Co., Detroit, Mich.
Wire & Cable Co., Montreal.

Wire Rope Fittings
Dominion Wire Rope Co., Montreal.

Wire Cloth
Greening, B. Wire Co., Hamilton, Ont.

Wire Drawing Machinery
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Wire Specialties
Meadows, Geo. B. Wire, Iron & Brass Works Co., Toronto.
Stanyon Metallic Furniture Co., Toronto.

Wood-Working Machinery
Advance Machinery Co., Toledo, Ohio.
Cowan & Co., Galt, Ont.
Crowdy, C. H., Machine Works, Fitchburg, Mass.
Goldie & McCullough Co., Galt, Ont.
London Machine Tool Co., London, Ont.
Petrie, H. W., Toronto.
Sheldon & Sheldon, Galt, Ont.
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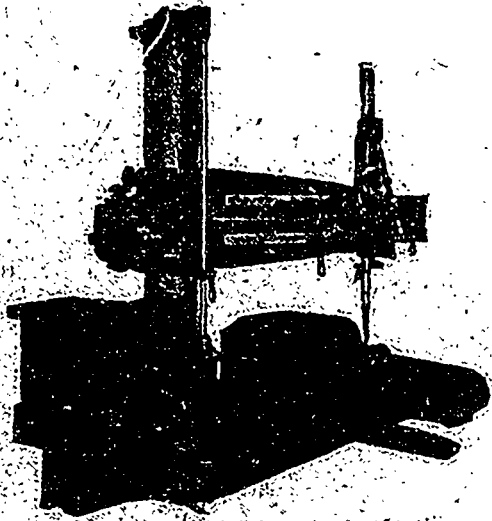
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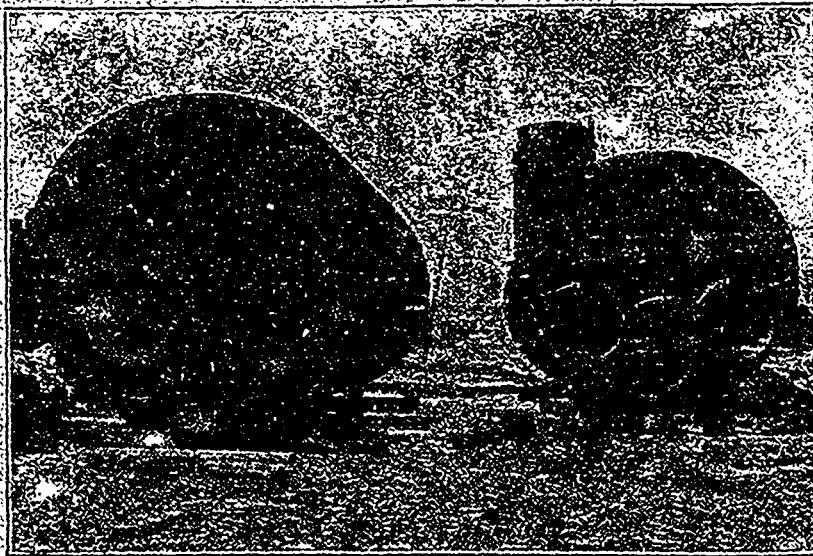
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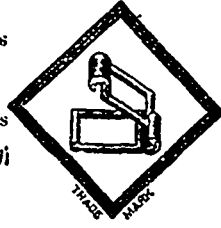
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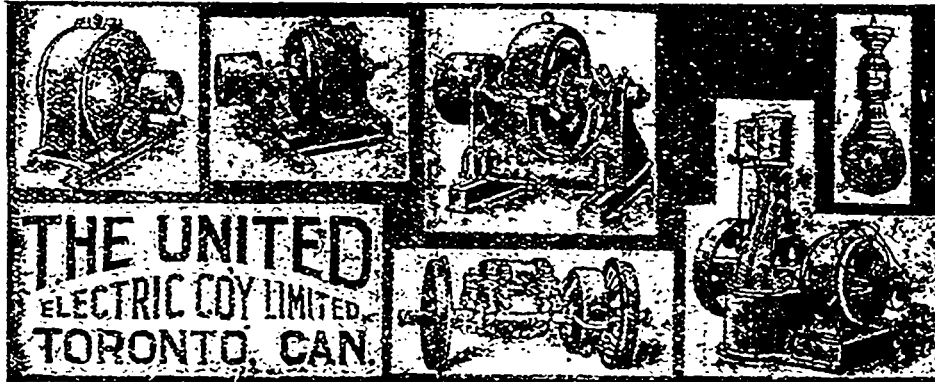
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