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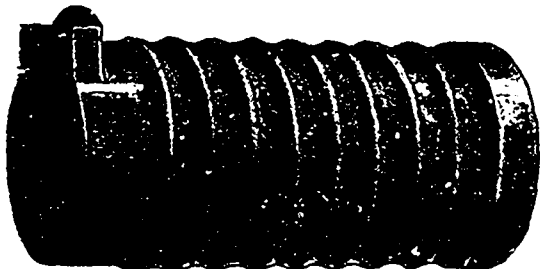
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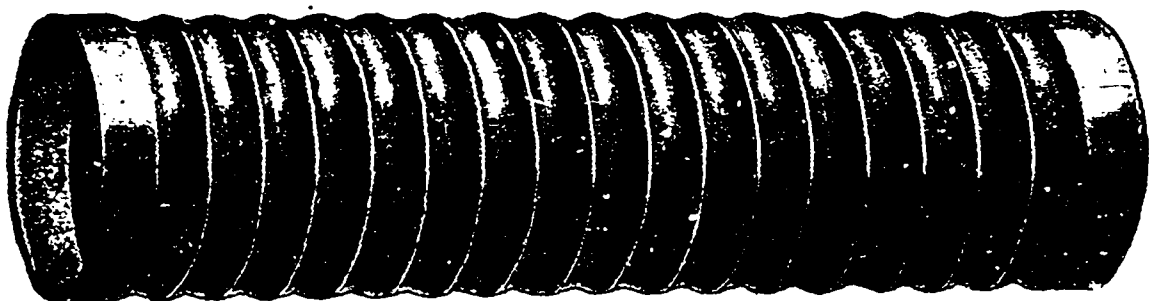


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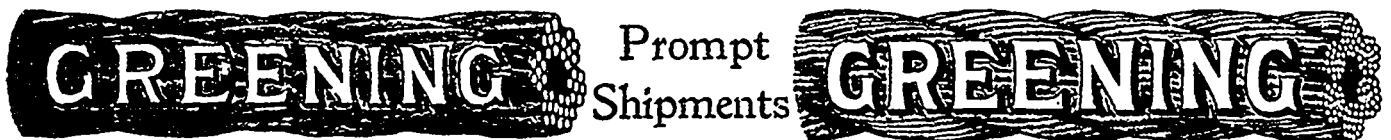
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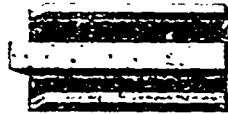
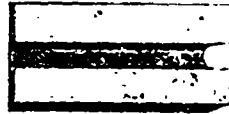
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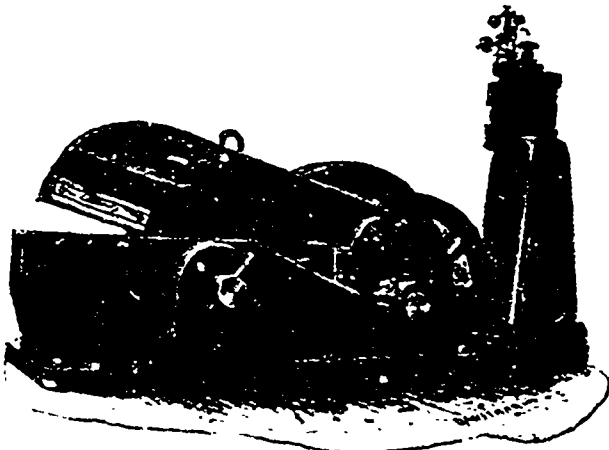
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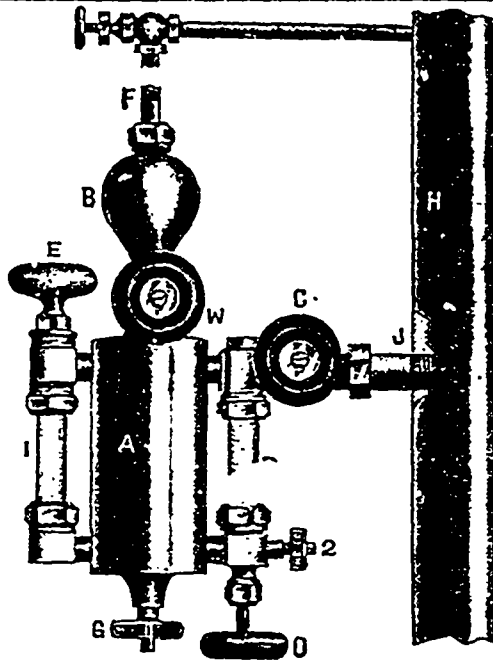
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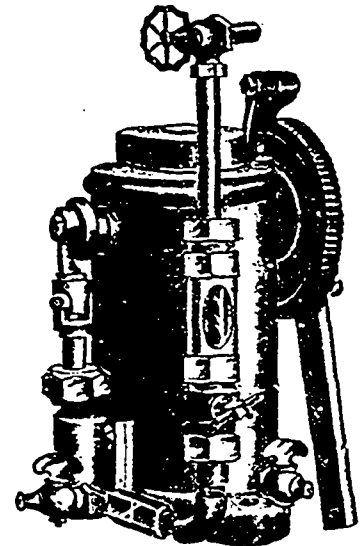
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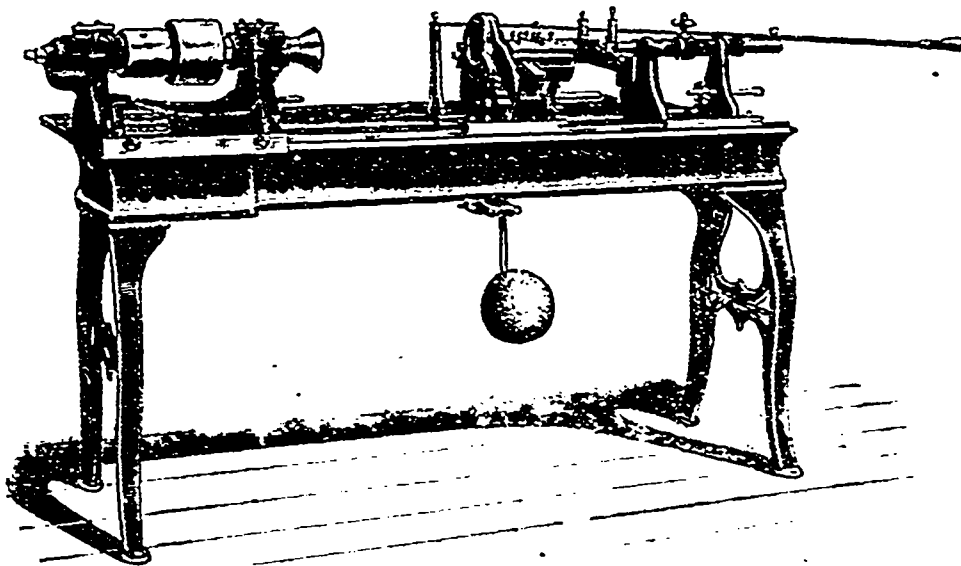
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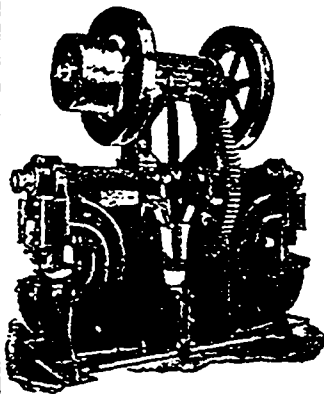
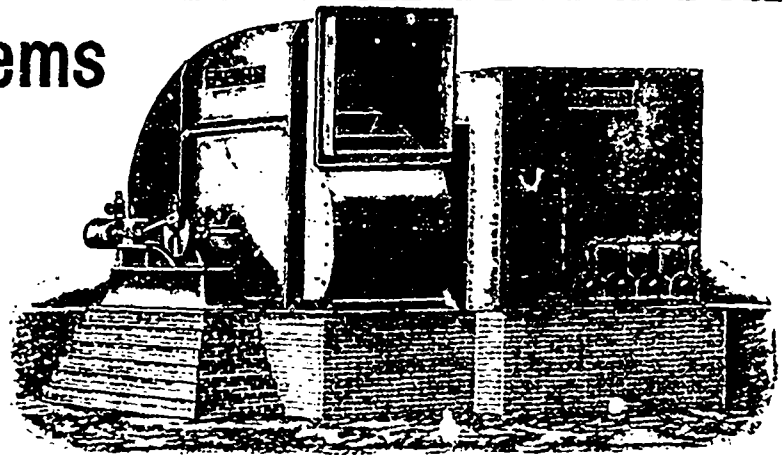
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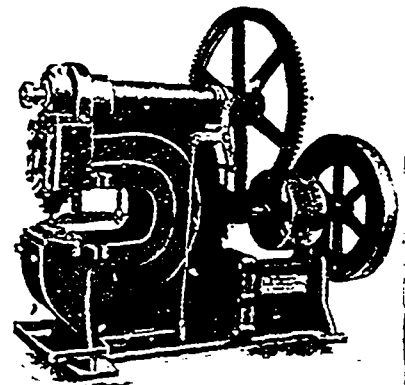
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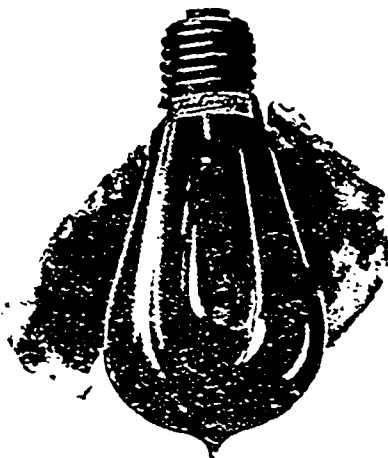
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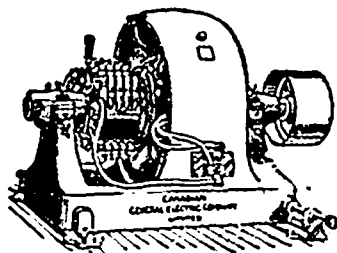
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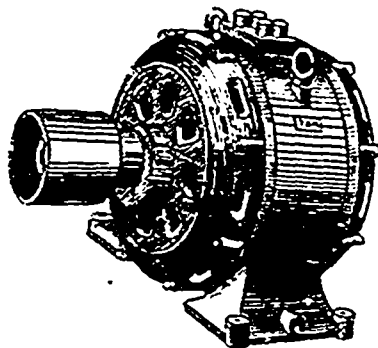
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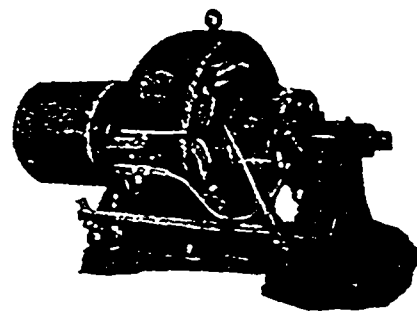
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McKinnon Building, Cor. Melinda and Jordan Sts., Toronto.

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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A BRIGHT OUTLOOK.

The building of the National Transcontinental Railway, otherwise and more familiarly known as the Grand Trunk Pacific Railway, will mean the spending of an enormous sum of money in Canada during the next few years. The length of the line may be set down at three thousand three hundred miles. The expenditure per mile will be rather less than two-thirds that of the Canadian Pacific. That road cost \$48,000 a mile, the new road will cost \$30,000 a mile. That means that a hundred million dollars will go into the building of the railway. The construction will cause the spending of huge sums in subsidiary enterprises. Additional capital will be attracted to the country to meet the expansion of the home market caused by the outlay on the railway. Additional workmen will be needed to supply the wants of the men working on the line. Some persons put the extra expenditure at another hundred millions. Two hundred millions spent in a country of Canada's population within the next few years will give an enormous impetus to industry and production.

An important phase of the situation, observes the Toronto News, is the number of workmen that will be needed. The expressed intention of the projectors of the scheme was to start work simultaneously at fifteen points, and to drive the railway through at top speed. Such a policy of compressing the work of building into five years will demand—according to competent judges—the continuous employment of 25,000 laborers. Twenty-five thousand additional laborers, we may say, for at present in Canada the demand for labor distinctly exceeds the supply. Wages are increasing already. They will take a further upward leap when the call goes out for the great army of navvies which will be needed on the new road. It is an interesting fact that the progress in labor-saving devices is such that the cost of railway construction work is decreasing in the face of the increase in the price of labor. It cost more to build the Canadian Pacific, when the men were paid \$1 and \$1.25 a day, than it costs to build similar lines to-day, although the men are paid \$1.75 and \$2 a day.

Two points stand out as of great and almost equal importance in the construction of the line. The all-rail outlet for the trade of the West cannot come too soon. The construction of branch lines through the prairies is an urgent need. It follows that the builders of the line will be obliged to balance their outlays and their demands for labor with great nicety. They must make all possible speed with the Winnipeg-to-Quebec section, they must simultaneously push the Grand Trunk Pacific Westward towards Edmonton, and they should leave themselves a residue of resources and of labor for the extension of feeder lines. It would, we hold, be sound policy for the Grand Trunk Pacific to spare from the outset a share of its energy and money for branches. They are the money-makers. By means of them a traffic should be waiting for the completion of the Government section. It will demand great skill of administration and possibly a measure of courage to carry out such a policy in the face of the high wages and probable difficulty in getting laborers which must be expected. But it is a policy worth adopting, difficult as it may prove. It will be worth while to seek to satisfy from the first the demand for branches which is one of the characteristics of the West. Slowness in providing railway facilities to the settlements which are starting up like magic in all parts of the country, might develop into a grievance. It might hurt the reputation of the country. The available supply of labor must be distributed with great skill. It will demand statesmanship to balance with accuracy the giving of immediate facilities to the farmers and the pushing ahead of the all-rail outlet.

A matter of great interest is the transition from construction to operation. It will not be a light thing to have an outlay of forty millions a year come to an end. It would be a serious matter were the whole twenty-five thousand laborers simultaneously thrown out of employment. We cannot believe that such a catastrophe will occur. Canada's power of absorbing workmen will probably increase with great rapidity. This will be a far bigger country in 1909 than it is in 1903. The opening of the West

is not the speculative enterprise which it was twenty years ago. It is in a far stronger economic position than it was when the last spike of the Canadian Pacific was driven. It possesses settled districts whose prosperity is due to their harvests, and not to settlers' capital expenditure. It possesses districts whose annual income is not diminished by the need for repaying debts. Henceforward we must expect to see side by side old-established districts of this character, newer regions whose farmers are paying off the obligations incurred in pioneer days, and the newest settlements where the initial expenditure is still promoting the first flush of prosperity.

A country of such a type has enormous digestive ability. For one thing, thousands of men who will be employed on the railway will be drawn into farming. For another, we may expect to see considerable railway work going on in the country after 1909. The Grand Trunk Pacific declare they have a plan to send a thousand-mile line into the Yukon. Branch-building probably will be very active in the Territories in the next decade. They will have Provincial powers then, and the Provincial Parliament will be likely to further the gridironing of the country.

The transition from building to operating, from capital expenditure to the earning of revenue, will be easier than it was in 1885. The fact of its approach should be kept in mind, and every possible step taken to make it as gradual as possible. The question appeals especially to Eastern Canada. To the older Provinces the chief source of profit in the building period will be found in the subsidiary industries. It will be important that the army of men on construction work remain in the country and continue to find something to do, whether as workmen on further railway enterprises, or as farmers, or in other occupations. As long as the home market is prevented from abnormal shrinkage, the East will be secure.

OBJECTIONABLE LEGISLATION SQUELCHED.

The Alien Labor Bill recently under discussion in the Dominion House of Commons, and which was finally passed in that body, received its quietus in the Senate the day before the adjournment. Peace to its ashes.

The Bill contained the following objectionable features:

It amended the present law so as to prevent the possibility of importing workmen from foreign countries.

While doing so, it provided a remedial clause by which employers might secure necessary labor through an order from a High Court judge. This order could be granted only after the case had been widely advertised by the judge, and an open court held where employees or any others might show reasons why the needed labor should not be imported, and where the employer would be obliged to open his business to his competitors and to the public. The delay, publicity and expense entailed by this "remedy" rendered the clause so objectionable that manufacturers would shun it rather than use it.

It provided that the Alien Labor Law should apply to all foreign countries, not to those only which enforced a similar law against Canada, as at present.

It amended the present objectionable law so that it might be more easily enforced.

It provided that any alien brought into Canada under promise of employment, might "be arrested without warrant and detained by immigration agents or special officers," for the purpose of being deported.

It provided for the appointment of special officers to administer the Act with as full measure of power as "is possessed by any court of record."

It penalized the making of false representations to induce immigration. With this we are heartily in sympathy but were refused the insertion of a clause providing similar penalty for the making of false representations to prevent immigration.

FORESTRY.

The preservation of forests for their influence on climate, fertility and water supply; the exploration of the public domain, and the reservation for timber production of lands unsuited for agriculture; the promotion of judicious methods in dealing with forests and woodlands; re-forestation where advisable; tree planting on the plains, and on streets and highways, and dissemination of information bearing on the forestry problem in general, should be objects of national importance, in which every citizen of Canada has a direct interest; and the work which the Canadian Forestry Association is doing in this direction is admirable. The subject of forest restoration has evoked an editorial in the Toronto Globe which we have pleasure in reproducing. It says:

The rapid disappearance of the forests of this continent gives vital interest to the question of preservation and reforestation. In the commercial and political administration of a heritage of forest wealth, Ontario has made a better showing than any State in the Union, and the methods of the Government are pointed to as the best yet adopted. In the practical work of preservation, too, the Province has an unequalled record. The recent report of a \$20,000,000 forest fire in Newfoundland shows the danger to which this form of wealth is constantly exposed, and at the same time proves, by comparison, the efficiency of our protection service. In the new occasions which have arisen through the denuding of the forests and the greater demand for all kinds of forest products Ontario must maintain her leading place. We have about 100,000,000 acres of forest land, of which some 40,000,000 must remain permanently wild, being unsuited for agriculture. In this area there is said to be the possibility of an annual revenue of \$40,000,000, or one dollar per acre. This seems like an unreasonably roseate prospect, but it is based on conservative estimates of the natural growth of standing pine and the possibility of cutting and restoring by seeding and planting. Without discussing the accuracy of estimated revenues, it is evident that the Province possesses a great source of permanent income in this forest land. Properly handled and systematically restored, it can be made to yield a yearly harvest that would permanently lessen the burdens of public administration and territorial development.

Reforestation is no longer an experiment, and it is well established that white pine can be planted and cropped with commercial profit. We must not wait for the pressure of necessity, but must show sufficient regard for the interests of posterity to lay a sound foundation for systematic work. Experience has shown that reforestation—the planting and harvesting of forest land—must be carried on by Governmental authority. Private enterprise cannot be enlisted where the returns are from 60 to 100 years in the future. The farmer may be induced to manage his wood lot with a view to continuous returns and with the added inducement of an advantageous wind-break; but the lumberman invariably desires to clear off the saleable timber and move to new limits. The practical work of reforestation may be regarded, roughly, as the planting of pine on such land as has been found unsuited for farming and in the limits from which the pine has been cut, and the strict reservation of sufficient pine for seeding in all limits under license. Natural seeding has been found effective where sufficient trees have been left for the purpose.

A natural aid to systematic work in the United States has been the establishment of colleges of forestry, and that plan could be followed with advantage in Ontario. At Yale and Ann Arbor the colleges of forestry are for men who have already graduated, and the course is two years. This plan seems to be the most satisfactory. There are many young men willing to spend the additional two years for training and a special degree in forestry. As the graduates are generally thrown on their own resources when embarking in practical work, the plan of a special course after graduating secures a maturity of judgment that might be wanting in case the study of forestry were made a branch of undergraduate work. At Cornell the undergraduates take a course in forestry, but the balance of advantage seems to be with the special course for more mature minds. At present the demand for trained men is greater than the supply, and this condition is likely to continue for many years. There will certainly be a demand for them in Ontario in the protection service, in estimating timber limits, scaling for stumpage dues, determining the trees to be cut and to be preserved for seeding, and in enforcing the more stringent requirements that will be necessary regarding the burning of brush and the clearing away of the debris of lumbering operations. Ontario must maintain her lead, and to that end the scientific training of students and the systematic restoration of denuded land have now become necessary.

LARGE COAL FIELDS UNDER THE SEA.

Mr. C. O. Macdonald, M.E. prepared a most interesting article for the *Industrial Advocate* upon the bituminous wealth of Nova Scotia which we have much pleasure in reproducing.

On April 11, 1903, says Mr. Macdonald, the Hon. Mr. Pipes, government leader in the Legislative Council of Nova Scotia, said, "Nova Scotia has three sources of wealth, (1) the wealth of the land, (2) the wealth of the sea and (3) the wealth under the sea. It is admitted,"

continued Mr. Pipes "beyond dispute, that there are hundreds of millions of tons of coal under the sea."

Four months earlier, the Royal Commission, to ascertain the amount of coal left in Britain, was calculating the quantity of coal available under the seas that surround Britain.

On that occasion one of the honorable commissioners made the statement which appears at the head of these notes, i.e., that there are large coal fields under the sea.

The expert before the Commission that day offered some interesting evidence on the value and importance of under sea collieries. Asked where the limit of the coal workable under the sea in his district was, he declared that he saw no limit to the extension of the collieries under the ocean, other than that of getting the men out to the distant working "faces" in time to do some efficient work. "Then," said the Commissioners, "there is no limit in view of the extension of the coal under the sea?"

"There is no limit in view" answered the expert. As the collieries under consideration are now miles out under the sea, this was considered important evidence and is well worth noting in Nova Scotia. Coal under the sea is recognized in Nova Scotia and in Britain, as a source of wealth of national interest.

The submarine collieries at Sydney Mines, Cape Breton, are a striking example in Nova Scotia of the usefulness of under sea collieries. These pits have been extending under the Atlantic for the last 30 years and others have followed, until there are now four under sea collieries in Eastern Cape Breton. There is nothing about them to suggest that they are under the sea. They look the same as mines under the land. In Britain coal has been worked under the sea for 150 years. Some of the "pillars" of coal standing in their now working under sea mines, are one hundred years old. Sometimes the collieries in Britain cannot be worked out from the land under water, in the coal, as is done in Cape Breton.

Shafts have to be sunk on the shore and tunnels set away under water, in the stone, at an angle which will catch the coal seams as they dip under water. Coal has been worked under such conditions to within about 90 feet of the water, taking out practically all the seam.

The under sea coal fields in Britain are relied upon to continue the world wide coal trade of the British Isles. The estimates prepared for "The Royal Commission on Coal Supplies," A.D. 1871, showed that there was then a huge tonnage of coal in their under sea coal fields. The experts calculated that in five of them there lay available a total of 3,000,000,000 tons of coal.

Since that time collieries have been digging it and have penetrated further under the sea than the commissioners of that day figured on. Expert calculations on the rich resources of the under sea coal fields in Eastern Cape Breton have also been made, for the Assembly of Nova Scotia. In A.D. 1877, Mr. H. S. Poole, then H. M. Inspector of Mines, reported that the under sea extension of the Sydney coal field, exclusive of seams thinner than three feet, should yield 1,866,000,000 tons of coal, within only three miles of the shore. The present Chief Inspec-

tor of Mines, Dr. Edwin Gilpin, Jr., made similar estimates in 1885.

The relative value of the land and under sea sections of the field can thus be recognized by a comparison of the Geological Survey of Canada's estimates of the coal available on the land, with Mr. Poole's estimate of the coal available under the sea ; e.g. :

| | Tons. |
|--|---------------|
| Coal available in land area; Sydney Coal field, exclusive of seams thinner than 4 feet, (Geological Survey of Canada's Estimate) | 1,000,000,000 |
| Coal available under the sea within 3 miles of the shore, exclusive of seams thinner than 3 feet. (H. S. Poole's estimate)..... | 1,866,000,000 |

The rich main seams now being worked at the collieries all lie in this under sea district. They do not exist at all over a large area of the land field, owing to the structure of the district causing them to rapidly run out inland. The under sea section of the field is thus obviously the richest comparison of the coal in the group of "old country" under sea coal fields, while the coal in the submarine field near Sydney also shows that Cape Breton is the inlet to one of the world's principal supplies of under sea coal. The extension of the great collieries of the Sydney coal field towards the sea, the location of new collieries near the sea shore and the thrusting of mines directly under the ocean is thus giving Canada access to one of the greatest under sea coal fields on the globe. The new population pouring into Canada will be an important factor in its development on a large scale.

The London (Eng.) Daily Mail, referring to the wonderful emigration to Canada, says that before many weeks have passed emigrants will be arriving in Canada from all parts of the world at the rate of a thousand a day. Never before in the history of the world, says the Mail, perhaps, has any country been peopled with such an astonishing swiftness. Whether this be all true or not it is certain that population is pouring in at a much faster rate than before. This increase in population cannot fail to create increased use for coal in manufacturing and other channels. The factories and coal consumers will call upon the Cape Breton collieries for ever increasing quantities of coal, and the pressure on these collieries, which possess only a small land area of the rich main seams, must cause a rapid opening up of this great under sea coal field, (in which the continuation of these main seams lies).

The accumulated experience of modern mining, the data of structural geology and the authentic records of coastlines retreating before encroachments of the sea, show that such coal fields are merely land coal fields with sea water spread over the top. The land in the Eastern Cape Breton (Sydney) coal field is waterproof.

In an old inhabited country like Britain, where records go back hundreds of years, the change of dry land to submarine land is traced by local historians, or by a comparison of old maps of the coast with the coast line

of 1904. Such records are not possible on so large a scale in so recently a populated country as Nova Scotia, but, through the observations of the late Richard Brown, for many years resident manager at Sydney Mines, we know that part of the land area of the Sydney coal field has become submarine coal field since the General Mining Association came to Cape Breton in 1827. Mr. Brown, in his "coal fields of Cape Breton," describes the process. He says: "The writer, from observations over a period of 30 years, has ascertained that the wearing away (by the sea) of the cliff, at one locality, averaged five inches per annum. In some cases this wasting of the land (surface) must have proceeded at a more rapid rate, as for instance at Cranberry Head, where some years ago (prior to 1871) a mass of strata 20 yards square and 15 yards high slipped off, into the sea. The effects of a similar land slip, on a much larger scale, may still be seen between Low Point lighthouse and the Barrasois, where a mass of strata, half a mile in length, 200 yards in width and 20 yards in height slipped down bodily, owing to the softening of the under clay, on one side by land springs and rains, on the other by the action of the surf." Of the transformation of land coal field into submarine coal field, in western Cape Breton, Mr. Brown says: "It is evident that a belt of coast, at least two miles wide has disappeared (on the coast of the Inverness coal field). If this process be repeated to the extent of only one mile more, the outcrops of coal now visible will be washed away. If correct plans are now made, showing the position of every seam, at a future time when all traces of them have disappeared they may be reached by cross cuts driven from the bottom of shafts sunk upon the adjacent shore and worked under the sea."

The writer of these notes has also seen this process of retreating cliffs and shore lines during his residence in Cape Breton.

The industrial future of Nova Scotia is thus so intimately associated with under sea coal fields that the study of submarine mining should be fostered; young engineers especially should thoroughly inform themselves on the structural geology, dips, strikes, etc. of the Sydney coal field and the surrounding region, the ocean soundings and configuration of the bottom of the sea, for upon their ability to lay out and direct collieries under the Atlantic must depend their selection for the high positions of the future.

EDITORIAL NOTE.

Chairman Bond, of the Advisory Board of Consulting Engineers of the Erie Canal, Col. Symonds and E. L. Corthell, members of the board, recently inspected the Peterboro lift lock, which has just been completed, and which is of cement construction. They find the stone parts of the Trent Valley Canal leaky and defective, while the cement portions could not be improved. They recommend cement construction for the locks on the proposed enlargement of the Erie Canal, which is to be made navigable for 1,000 ton barges.

PIONEERS OF CANADIAN INDUSTRY.

JOHN AND ALEXANDER GARTSHORE.



JOHN GARTSHORE.

John Gartshore, father of Alexander Gartshore, of Hamilton, Ont., recently deceased, was born in Lanarkshire, Scotland, in the year 1810, and came to Canada in 1829. Up to 1835 he was occupied in millwrighting in various parts of the country, finally settling in Fergus, Ont., where he built an oatmeal mill, which he operated until 1837, when it was destroyed by fire. Shortly after that he removed to Dundas, Ont., where he established what afterwards grew to be one of the chief manufacturing institutions of the country. He first built what was known as the Ewart mill, at Dundas, which he operated for some time, and then, in 1839, he started in the foundry business at that place, first in a small way as to its dimensions, but destined for an important future, for John Gartshore was the pioneer manufacturer of grist and saw mills in Canada. In 1846 he was again burned out, but soon had his works rebuilt and on a much larger scale. The construction of marine work was added, and during the time the Great Western Railway was being built, large quantities of machinery were manufactured by him for that road. Under John Gartshore's management the business steadily increased until it reached very large proportions. The average number of men employed for years in his establishment was about 300. John Gartshore died in 1873.

Alexander Gartshore, son of John Gartshore, was born in Dundas, Ont., in 1839, and died July 13, 1904. In 1854, when a

lad of fifteen, he went to West Point Foundry, New York State, to learn the trade of a machinist, and on his return home, four years later, he entered his father's works at Dundas, into which he was taken as a partner in 1865. It was during this time that the famous engines of the Hamilton Water Works were constructed and put into operation by this concern. They were built in 1858, and were the first compound double cylinder engines that were ever made in America. The type of engine was copied from those in use at that time in Leeds, England. The drawings were made at West Point by Alexander Gartshore in 1857, under the supervision of Mr. Rumph, the then superintendent of the West Point foundry. These engines are yet in active use, and are in perfect order. James Macfarlane, the man who was put in charge of these engines at the time of their installation, is still there in charge of the Hamilton Water Works, and previous to that time he was a valued employee in the Gartshore foundry in Dundas.

Another monument to the mechanical skill of John Gartshore and his son Alexander, was the manufacture of the engines of the steamer Great Western, the first railway ferry boat to run between Detroit and Windsor. This boat, which was put into service in 1867, is still running. In 1870 Alexander Gartshore moved to Hamilton, and went into the foundry business there. He first engaged in making castings for railways, until in 1876 he began the manufacture of cast iron pipe for water, sewer and gas purposes. In 1896, the business was converted into a joint stock company, under the name of the Gartshore, Thomson Pipe & Foundry Co.



ALEXANDER GARTSHORE.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

THE FRASER RIVER BRIDGE.

The new Provincial bridge over the Fraser River at New Westminster, B.C., was formally opened for traffic on July 23 last, by the Lieut.-Governor Sir Henri Jolly de Lotbiniere, the Prime Minister, Mr. McBride, ministers and members of the Provincial Department of Public Service and others.

The occasion was one of importance, not only because of the great size of the bridge itself, which is one of the largest in the Dominion, but also on account of the difficult engineering features which were met and overcome during the course of construction, and the great commercial advantage that will ensue now that it has been successfully completed.

This bridge is one of the most notable structures of its kind in Canada, and one portion, the peculiar spreading span at the New Westminster end of the structure, is probably unparalleled anywhere in the field of bridge construction. It was the erection of this portion which taxed the ingenuity of the contractors as the problems introduced, were such as rarely enter into the ordinary course of bridge construction.

The Fraser River at this point is about 2,200 feet in width, has a maximum depth of 85 feet and a very swift tidal current; the tides



Floating the spread span into position on scows.

The unusual feature of this bridge is the spreading span at the northern or New Westminster end. It was designed to permit of the approach of railway tracks from both east

This spreading span is 21 feet wide at its narrower end, and the trusses spread uniformly to a width of 135 feet, carrying a double line of stringers in the railway floor system, and an elevated plate girder highway system supported by steel columns resting upon the main floor beams of the railway floor. The long end floorbeam is a box plate girder, 12 feet deep, and weighs over 82 tons. It was shipped to the field in sections.

Some features of the erection may be worthy of note. The long fixed span (380 feet) which is situated where the water is the deepest, was erected upon the false work provided for the swing span, then raised by scows floated to place above its piers, then dropped into position by the falling tide. The weight of this span was over 804 tons.

In erecting the spread span, one truss was erected upon false work placed alongside the smaller spans in shallow water. This truss was then swung out upon scows to the proper position of skew, and securely anchored there. The other truss was then erected upon the same false work and the two braced together by the smaller floorbeams and the top lateral bracing. The span was then floated into place in a manner similar to the other spans. The longer floor beams which had been shipped in some 200 separate sections, were then erected upon scows, floated beneath the span and placed in position by the rising tide.

Following the formal ceremonies of the dedication, there was a long procession of river craft through the open draw, Indian

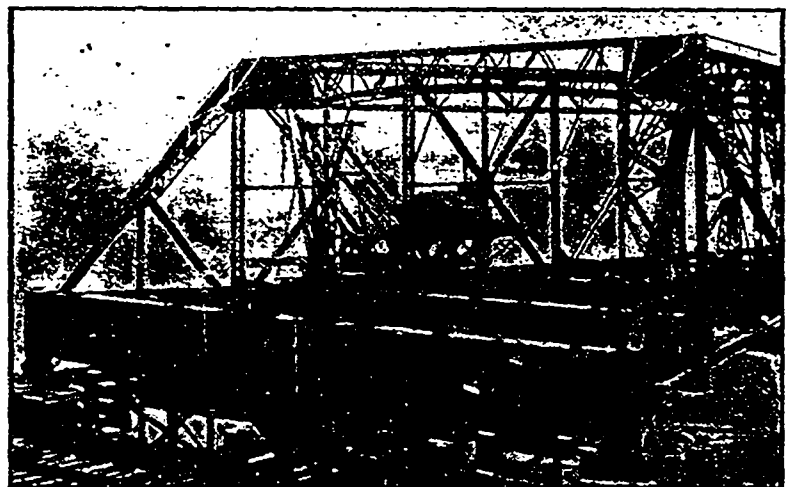


General view of the structure just after the spread span had been floated into place on its piers.

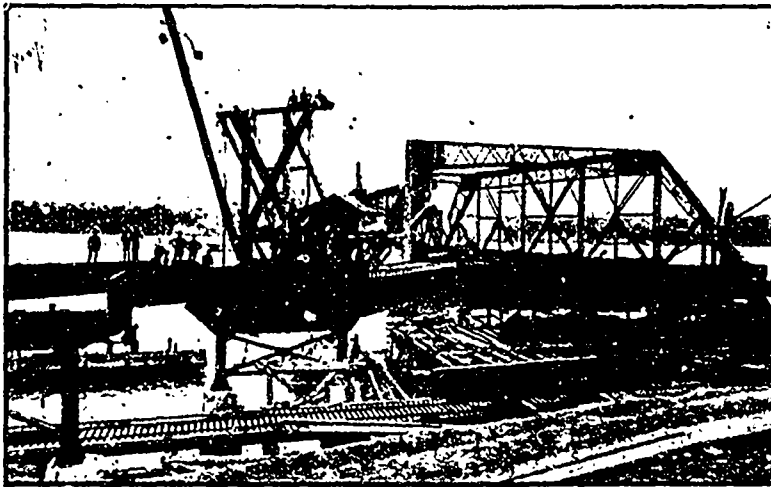
sometimes rising to a height of 14 feet. The bottom is covered to a depth of many feet with soft river mud, and it was in such a situation, the piers had to be located. The substructure work is granite masonry, resting upon solid concrete foundations, carried down through the soft bottom to the harder strata below. Timber cribs were sunk by dredging through wells, and in these the concrete foundations were placed. The footing of the deepest pier reached the great depth of 141 feet below the mark of high water.

Briefly stated, the steel superstructure consists of the following: Five similar through truss spans, each 159 feet in length, a draw span 380 feet in length, a heavy fixed span 380 feet in length, a spreading truss span 225 feet in length, plate girder approach spans of various lengths for both highway and railway. It is approached from the south by long trestle construction, making the total length of the bridge and its approaches more than two miles. The structure is designed to carry electric cars, railway and highway traffic. The railway floors occupy the lower deck, and the highway, passing over the tops of the five smaller spans, is supported through the others by a specially constructed deck, and reaches the street in New Westminster by a long plate girder approach. Some 4,000 tons of steel were used in this superstructure.

and west, where the main through track passes close to the end of the bridge, and is laid at the foot of a steep bluff, thus making a long straight approach out of the question.



The spread span with the big floor beams in place. End floor beam 135 feet long, weighing over 82 tons.



The railway approach curves at the northern end.

canoe races, a banquet tendered by the contractors, with toasts and speeches by the assembled officials and guests, and in the evening a grand exhibition of fireworks with a second procession of river craft, gaily decorated with colored lanterns.

Perhaps no better idea of the light in which this great structure is viewed by the people of British Columbia, can be conveyed than by quoting from the speech of the Minister of Lands and Works, the Hon. R. F. Green. Mr. Green said, "The building of this bridge is the greatest public work ever undertaken in British Columbia. Next to this come the parliament buildings at Victoria, but even these fall short of this. As an up country representative, I am prepared to say that the Province does not stand in a position of criticism for having been able to persuade the

Government to assist in building this magnificent structure. We should be proud of it because it is built by Canadians and of Canadian material; and I venture to say that there is no bridge in the world to-day that is better constructed than the Westminster bridge."

The work of construction of the Fraser River bridge began in August 1902, and was completed in July, 1904. The designs for the structure were prepared by Messrs. Waddell & Hedrick, consulting engineers, Kansas City, Mo. The inspection of the steel and supervision at the manufacturing shops was in charge of the DeLamo-Osborn Engineering Co., Limited, Toronto. The steel superstructure was built and erected by the Dominion Bridge Co., Montreal, and substructure by Armstrong, Morrison & Balfour, Vancouver.

THE CHAPMAN DOUBLE BALL-BEARING EQUIPMENT.

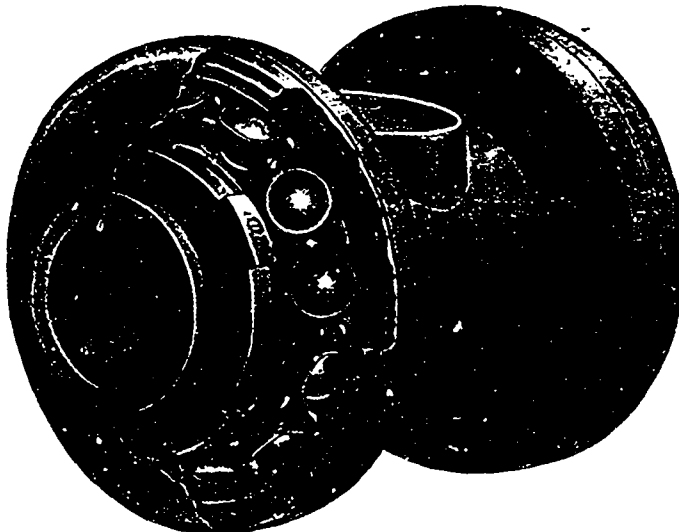
Among the many new and important Canadian manufacturing industries recently established is the Chapman Double Ball Bearing Co., of Canada, Limited. This company began the equipment of a plant for the manufacture of double ball bearings in November, 1903, and the bearings were placed on the market in April of this year. Since that time the company have installed their bearings in 35 different Canadian manufacturing establishments, including a number of the most prominent concerns in Canada. In every case the bearings have given complete satisfaction, and are showing a large saving in power under the most severe load and speed conditions.

The plant of the company is located at 39 Pearl Street, Toronto, and is thoroughly equipped with the most modern machinery for the manufacture of these bearings, a large part of the special equipment being built by the company themselves.

In the Chapman bearing, as will be seen from the accompanying cut, every alternate ball is smaller in size, and rolls between the adjoining balls of larger size, on which the working pressure is brought. The balls are retained

in a steel cage accurately fitted in such position as to insure a positive rolling motion, and all cross friction and sliding motion is thus eliminated. The cones are held rigidly upon the sleeve by the adjusting nut. This feature insures perfect alignment, and gives the entire inner surface of the cone for a bearing. The cones, ball races and balls are of a quality of steel best adapted to this work, accurately ground to size, and the result is a bearing that combines correct scientific principles with simplicity and durability of construction.

The question of the journal bearing compared with the Chapman Double Ball Bearing as a device for saving power reduces itself to this. In the first instance, two surfaces rep-



The Chapman Double Ball-Bearing.

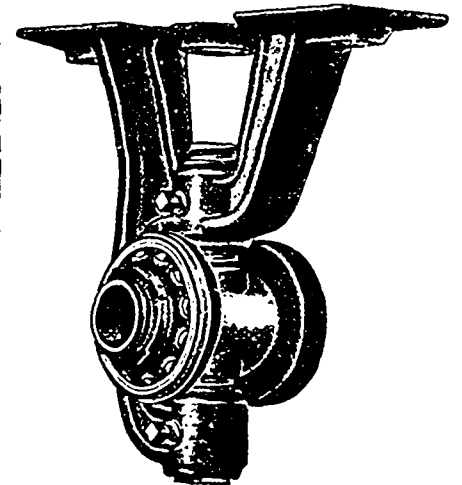
resenting sliding friction are separated by a film of oil to overcome the journal friction; and as the load is increased the friction of the journal is increased in direct proportion. Here the elimination of the friction between the two surfaces is wholly dependent upon a film of oil, which in actual practice decreases as the load is increased. On the other hand, the positive rolling motion as developed in the Chapman type of bearing does not depend upon a lubricant to overcome friction; and as the load is increased the load friction is increased only in proportion to the weight, supported on points in rolling contact.

A comparative test recently made between the ordinary journal bearing and the Chapman bearing in which the pressure in each case was gradually increased to 8,000 pounds, illustrates this very clearly. The increase in the load was indicated by a General Electric Watt meter in circuit with the motor. The motor required five hectowatts.

Following are the results:—

| Weight. | Journal Bearing. | Ball Bearing. |
|------------|------------------|---------------|
| No. load. | 11 h.w. | 5½ h.w. |
| 500 lbs. | 13½ " | 5½ " |
| 1,000 lbs. | 15 " | 5½ " |
| 2,000 lbs. | 16½ " | 5½ " |
| 3,000 lbs. | 17 " | 6 " |
| 4,000 lbs. | 18½ " | 6 " |
| 5,000 lbs. | 20 " | 6½ " |
| 6,000 lbs. | 21 " | 6½ " |
| 8,000 lbs. | 23½ " | 7½ " |

The double ball bearing in addition to the saving in power which it effects, does away



Chapman Hanger No. 1.

almost entirely with oiling and attention which are necessary with the journal bearing, and entirely eliminates the danger of fire caused by hot boxes, as the bearings run perfectly cool under the highest speeds.

These bearings have undergone the most severe tests during the past four years in the United States. In the Orswell Mills of Fitchburg, Mass., they have been running under 125 h.p. load at a speed of 600 revolutions per minute for three and a half years, and the saving in shaft friction in this case amounted to 23½ per cent. of the entire power.

Among the Canadian plants in which these bearings have been installed are the following: McLaughlin Carriage Co., Williams Piano Co., and Oshawa Steam & Gas Fitting Co., Oshawa, Ont.; Canada Carriage Co. and Jas. Smart Mfg. Co., Brockville, Ont.; The Gurney Tilden Co. and the John McPherson Co., Hamilton, Ont.; the Metallic Roofing Co., Graham Nail Works, Canadian Feather & Mattress Co., Sheppard Bros., and Watt & Watson, Toronto; the United Factories, Newmarket, Ont.; John Leins, Bornholm, Ont.; Cowan & Britton and Watt Bros., Ganano-

que, Ont.; Horn Bros., Lindsay, Ont.; Dominion Organ & Piano Co., Bowmanville, Ont.; Dominion Linen Mills, Bracebridge, Ont.; Barrie Carriage Co., Barrie, Ont.; Keenan Bros. Owen Sound, Ont.; Geo. Pattinson, & Co., and the Preston Furniture Co., Preston, Ont.; Clark Dental Mfg. Co., Gravenhurst, Ont.; and the Alabastine Co., Paris, Ont.

The bearings are now made for all standard sizes of shafting, and are adapted to all adjustable hangers. These bearings are now in use in all classes of manufacturing establishments in which the production of power on an economical basis is considered. The company guarantee a saving of 75 per cent. of the shafting friction, and the success already attained indicates a rapid introduction of this type of bearing in Canadian industrial establishments.

Last year the company made a very attractive exhibit at the Toronto Exhibition, and all line shafting in Machinery Hall was equipped with these bearings. Comparative tests were made with the plain journal equipment, which showed a saving of 80 per cent. in favor of the ball bearings, and the results were so satisfactory that the shafting will again turn on ball bearings this year. The company will also have an attractive exhibit at the Exhibition this year of the different classes of bearings which they manufacture.

GROWTH OF CANADIAN LAKE MARINE.

An examination of the registry of the vessels engaged in the freight or freight and passenger trade of Canada reveals that there are very few modern vessels of large capacity engaged in the trade. On the Atlantic coast, with the exception of the coal carrying trade from Sydney and Parrsboro, Nova Scotia, the trade is done in locally built schooners, or small coasting steamers of less than 200 tons register. In regard to the trade from Parrsboro, the coal is carried mainly in tow barges having a capacity of about 2,000 tons dead-weight, while from Sydney it is carried in steamers, some of which are owned by the Dominion Coal Co., and the others are chartered. All these vessels, however, have been built in Great Britain, and the smaller ones only are owned in Canada, the remainder being owned mostly in Norway. There are a number of fairly large steamers engaged in the coasting trade, freight and passenger, between Montreal and Quebec and maritime province ports, but they also are British built, though Canadian owned. The British type of vessel predominates on the Atlantic coast, as it does on the Pacific, so far as freighting is concerned. The only exceptions on the western coast is in the vessels engaged on the river trade, where flat-bottomed and stern-wheeled steamers are used. This type of steamer is susceptible of little improvement in its general design, consequently it is not necessary to say anything about it. Of the vessels engaged on the minor internal waters there are but few vessels of any size, the most noticeable being those found on Lake Winnipeg, the Lake of the Woods, Lake Temiskaming and Muskoka Lake. Those on the latter lake are almost entirely for the passenger trade, and of those on the other lakes, the Keenora, on the Lake of the Woods, and the Meteor, on Lake Temiskaming, were built since 1897.

Coming to the Great Lakes and the St. Lawrence river system of fresh water navigation, a disinterested and unprejudiced

observer would be inclined to state that the Canadian merchant marine there was little more than a myth. There are but few modern steamers in the service, and of these the majority are British built, and only a few of the British built steamers having been specially built for the trade. Of the Canadian built vessels engaged in freighting on the Great Lakes there are only a few that can be said to be of recent construction and equipment. The reason for this is not hard to see, because there was no necessity in Canada for large freighters until within the last few years, and even to-day, the quantity of cargo freight, as distinguished from package freight, is limited. The cargo freight is entirely eastbound, and consists of grain from Lake Superior to Georgian Bay points, or Kingston, for transhipment to Montreal, and iron ore from Michipicoten to Hamilton. The total of this trade will not run to much over 1,000,000 tons in a year. This trade has been a growing one, because 20 years ago there was no surplus produce in the North-West for export, and the Helen mine was unknown seven years ago. Twenty years ago the Canadian Pacific Railway placed on the upper lakes the steamers Alberta, Athabasca, and Algoma, built in Great Britain, and of about 1,550 tons register each. Of these, the Algoma was lost, but was replaced by the Manitoba, 1,699 tons register, built at Owen Sound, by the Polson Iron Works, of Toronto, in 1889. These steamers are constructed for the freight and passenger trade, and this type of steamer, judging from the number built since for trading between Canadian ports, has been the most profitable during the period of growth. A glance over the registry of vessels published by the marine department, and of the list of vessels brought on to the Great Lakes within the last three or four years, but which are registered elsewhere, shows that there are about sixty-five steamers of over 300 tons register engaged in cargo freight trade, or the freight and passenger trade. Of these, thirty-five were built in Canada, eight in the United States, and twenty-two in Great Britain. Of those built in Great Britain, eighteen were built to suit the trade, and four were purchased as being suitable for the trade. Coming to the age of these vessels, there are two built in 1867 and 1868 respectively, six built between 1870 and 1879, seven built between 1880 and 1889, twenty-two between 1890 and 1899, and seventeen between 1900 and 1903, inclusive. Of those built between 1890-1899 four were only placed on the upper lakes in 1902.

So far as the type of vessel is concerned there are two classes, one of which is intended for trade on the upper lakes only, and the other of Welland Canal size. Looking at the small number of vessels engaged in the trade it will be sufficient to say that we are only at the beginning of the development of the freight vessel for navigation on the Canadian inland waters. Following is a list of the vessels added to the different lines from 1900 to the end of 1903, with names of owners, etc., as gathered from official and other sources:

1900—Ottawa, built for J. R. Booth, Ottawa, at Toronto; length, 256 feet; beam 43.2 feet; depth, 15.2 feet; gross tonnage, 2,431; net tonnage, 1,344.

Donnalona and Stratheona, built for the Hamilton and Fort William Navigation Co. in Great Britain; 1,222 tons and 1,465 tons register, respectively.

1901—Midland Queen, 1,348 tons register, built in Scotland for the Midland Navigation Co., Midland, Ont.

1902—Turret Court, 1,197 tons register; Turret Crown, 1,190 tons register; Turret Chief, 1,197 tons register; Turret Cape, 1,142 tons register. These steamers were built at Sunderland, England, in 1895-96, and are of

the turret type. They were run between Sydney and Montreal by the Dominion Coal Co., when W. Petersen, of Newcastle-on-Tyne, England, the owner, purchased the Canadian Lake and Ocean Navigation Co., Toronto, and transferred the steamers to the Upper Lakes under its management. The company subsequently had built in England and Scotland three additional steamers specially designed for passing through the Welland Canal. These steamers are of about 2,000 tons register, and are: J. H. Plummer, H. M. Pellatt and A. E. Ames.

Simla, built at Garden Island, Ont., for the Calvin Co., 973 tons register.

Huronic, built at Collingwood, Ont., for the North-West Transportation Co., (Northern Navigation Co.); 3,530 tons register.

Tadenac, built at Toronto for the St. Lawrence and Chicago Steam Navigation Co., Toronto; 3,150 tons register.

Fairmount, built in Great Britain for the Montreal Transportation Co.; 1,183 tons register.

1903—Midland King, 4,900 tons gross, built at Collingwood, Ont., for the Midland Navigation Co., Midland, Ont.

W. D. Matthews, 3,959 tons register, built at Collingwood, Ont., for the St. Lawrence and Chicago Steam Navigation Co., Toronto.

Westmount, 1,172 tons register, built in Great Britain for the Montreal Transportation Co.

Neeburg, 3,000 tons dead-weight capacity, built in Great Britain for the Neeburg Navigation Co., Port Arthur, Ont.

Wacandah, 966 tons register, and Nee-pawah, 990 tons register, built in Great Britain for the New Ontario Steamship Co., Hamilton, Ont.

Tadusac, 2,500 tons register, built at Toronto, for A. Wright (Toronto Victoria Harbor Lumber Co.)

Freemount, 3,400 tons gross, built in Great Britain for the Farrar Transportation Co., Collingwood, Ont.

Wexford, 3,500 tons gross, built in Great Britain about 1890, and bought by a Collingwood company.

No mention is made of the Algoma Central Railway Co.'s fleet, which consists of two freight and passenger steamers purchased in the United States, but registered at Sault Ste. Marie, Ont., and the owner at St. John's, N.F.; a number of freight carriers registered at United States ports, where they were purchased, and a 6,000 gross ton barge, the Agawa, built at Collingwood in 1902.

Of the freight carrying steamers built in Canada, the Bertram Engine Works Co., Toronto, have built those of canal size, while the others were built by the Collingwood Shipbuilding Co., Collingwood, Ont. The former company have now under construction a grain and package freight carrier capable of carrying 70,000 bushels of grain through the canals. Her dimensions are: Length over all, 256 feet; breadth, 42 feet; depth, 18 feet; and she will be fitted with one triple expansion engine, cylinders 15 inches, 25 inches and 42x30-inch stroke, to which steam will be supplied by two return tubular Scotch boilers, 10 feet diameter, by 11 feet long, at a pressure of 180 pounds. It is expected to develop a speed of 12 miles light and 10½ miles loaded. Accommodation is also being provided with all modern conveniences for the package freight trade, including six 3-ton deck cranes. So far as the Polson Iron Works, Toronto, is concerned, it has been lately engaged in the construction of dredges, lightships and other vessels for the Dominion Government, and yachts, etc., for private owners. With the entrance into the construction field of the Canadian Shipbuilding Co., which will probably be this season, it is believed that there will be some extensive developments in the way of shipbuilding.—Marine Review.

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 telephono, 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 machine machinery, or supplies, such as steam engines and boilers, shafting, pulleys, belt ing, 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 Fort William Contracting Co., Fort William, Ont., have been incorporated with a capital of \$10,000, to carry on a contracting and warehousing business. The provisional directors include C. W. Jarvis, A. Snelgrove and C. Beaton, Fort William, Ont.

The Silver King Gold & Copper Co., Toronto, have been incorporated with a capital of \$2,000,000, to carry on a mining, milling and reduction business. The provisional directors include H. L. Holmes, Niagara Falls, N.Y., W. H. Merrill and G. W. Morris, Buffalo, N.Y.

The Lockhart Photo Supply Co., Toronto, have been incorporated with a capital of \$15,000, to manufacture photographic supplies, etc. The provisional directors include F. R. Lockhart, A. Oakley and W. L. Matthews, Toronto.

The Canadian Cement Brick Co., Toronto, have been incorporated with a capital of \$150,000, to manufacture cement, brick, machinery, presses, etc. The provisional directors include Wm. Williamson, C. D. Scott and Jas. T. Scott, Toronto.

The Wilson Fyle Co., Niagara Falls, Ont., have been incorporated with a capital of \$20,000, to acquire the business of Wilson, Fyle & Co., and to manufacture medicines, etc. The provisional directors include T. A. Wilson, Zephyr, Ont., W. J. Fyle, Niagara Falls, N.Y., and J. J. Foster, Buffalo, N.Y.

The Reformer Printing Co., Galt, Ont., have been incorporated with a capital of \$20,000, to carry on a printing and publishing business. The provisional directors include J. M. Cameron, J. H. Fryer and Geo. Laird, Galt.

The Canadian Talking Scale Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture automatic scales, etc. The provisional directors include A. McL. Macdonell, R. W. Ball and T. H. Barton, Toronto.

The Dominion Cement Brick Co., Toronto, have been incorporated with a capital of \$50,000, to manufacture cement, cement bricks, etc. The provisional directors include W. J. McMurtry, J. E. Webb and J. D. Dobie, Toronto.

A new steamer named the Egin L. Lewis, for the freight and passenger trade on Lake Simcoe, has been launched at Orillia, Ont. She will have accommodation for 125 passengers.

The Lake of the Woods system of navigation is an international one, as it borders on the state of Minnesota for some distance. On the United States side the government is doing considerable dredging at War-road, and the War-road Transportation Co. are having

a new steamer built for the trade. In Canada the department of public works recently had an engineer going over the Rainy River, which connects the Lake of the Woods and Rainy Lake, forming the international boundary, to see what it is necessary to do to improve the navigation along it.

The London, Aylmer & North Shore Electric Railway Co. will finish their road, which will be 45 miles long, and will erect a power station and repair shops at Aylmer, Ont.

The Hamilton & Toronto Electric Railway Co., have arranged with the Grand Trunk Railway Co., for the use of their track across Burlington Beach and will construct another track on the Grand Trunk right of way.

A company in which Geo. E. Watson, of the Watson Pattern Works, Toronto, is interested, is being formed to manufacture a line of brass goods, including lubricators, injectors, valves, etc.

The Grand Trunk Railway will install a water plant at Stratford, Ont., at a cost of \$20,000.

A new clamshell unloader is being installed at the Pittsburg Coal Co.'s dock at Sandwich, Ont.

It is stated that a contract has been entered into by the Canadian General Electric Co., Toronto, to supply \$2,000,000 worth of machinery to the Ontario Power Co., at Niagara Falls, Ont. The contract includes practically all of the plant for the Ontario company, including machinery for generating turbines and the necessary equipment for the transmission of power.

The Campbell Milling Co., Toronto Junction, Ont., have been incorporated with a capital of \$150,000, to carry on a flour milling and manufacturing business. The provisional directors include A. Campbell, D. A. Campbell and J. McEachern, Toronto Junction.

A. F. Dickson's flour mill at Atwood, Ont., was destroyed by fire July 16.

The Toronto & Hamilton Electric Railway Co. propose constructing an underground crossing under the tracks of the Canadian Pacific Railroad and Grand Trunk Railroad at Toronto Junction, near the Grand Trunk Railroad station, and then enter Toronto from the north-west.

The Ontario Traction Co., Walkerville, Ont., have been granted a thirty-year franchise to operate electric cars in Sandwich East, Ont.

The Grand Trunk Railway Co. have about completed plans for extensive new shunting yards and a round house at Mimico, a western suburb of Toronto.

The Mimico & Toronto Electric Railway

owned by the Toronto Street Railway Co., are applying for permission to cross the Grand Trunk Railroad line at Sunnyside.

The Canadian Electric Traction Co., recently incorporated in London, Ont., to construct a high-speed electric railway on the polyphase system from London through the city of St. Thomas to Port Stanley on Lake Erie and from London to Hamilton, Ont., have awarded the contract for the equipment of their power plant to Messrs. Bruce, Pebbles & Co., Edinburgh, Scotland. There will be ten motor cars with a capacity for fifty passengers. The motor equipments will be of 250 h.p. each, and the power house equipment will have a capacity of 1,000 h.p. The value of the contract is £42,250.

Work has been commenced on the building of seven new crude oil tanks on the property recently purchased by the Imperial Oil Co. at Sarnia, Ont. Five of the tanks will be of the capacity of 35,000 barrels each, and two of them will have a capacity of 10,000 barrels each.

Messrs. E. & S. Currie Co., whose premises were destroyed in the great Toronto fire, will erect a seven-story fire-proof building.

Wm. Breeze's woolen mill and sawmill at Forest Mills, Ont., were destroyed by fire July 22. Loss about \$6,000.

A by-law will be voted on at Cornwall, Ont., to loan J. B. Atchison \$17,500, for the erection of a sawmill and sash and door factory to give employment to 30 hands.

The ratepayers of Cornwall, Ont., will vote on a by-law to exempt the woolen mill of the Canadian Colored Cotton Co. from taxation, in consideration for which the company will equip the mill and resume operations at an early day.

The Polson Iron Works Co., Toronto, propose starting the construction of motor boats, and are acting as agents for the Thorneycroft firm of London, England. A sauple motor boat making 20 miles an hour has been brought out by Mr. F. B. Polson.

The Aylmer Iron Works Co., Aylmer, Ont. will increase their capital from \$30,000 to \$70,000.

The Barrie Carriage Co., Barrie, Ont., will increase their capital from \$10,000 to \$100,000.

Typograph, Limited, Windsor, Ont., have been incorporated with a capital of \$80,000, to manufacture machinery, tools and apparatus for producing light, heat, etc. The provisional directors include J. B. Allen, Detroit, Mich., F. H. Macpherson, and S. B. Best, Windsor.

The Northern Mfg. Co., Windsor, Ont., have been incorporated with a capital of \$10,000, to manufacture machinery, tools, engines, etc. The provisional directors include F. H. Macpherson, Windsor, J. T. Nichols and I. W. Durfee, Detroit, Mich.

The Pandora Cap Co., London, Ont., have been incorporated with a capital of \$25,000 to manufacture hats, caps, etc. The provisional directors include F. A. Jones, E. Jones and Geo. Brooks, London, Ont.

The Canadian Newspaper Co., Toronto, have been incorporated with a capital of \$40,000, to carry on a newspaper publishing business, etc. The provisional directors include E. H. P. Thomson, Morrisburg, Ont., A. H. Lougheed, and D. Bain, Toronto.

The British Columbia Process Co., Toronto, have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include A. B. Cook, G. E. Kingsley and R. M. Melville, Toronto.

The Windsor Pump & Foundry Co., Windsor, Ont., have been incorporated with a capital of \$40,000, to manufacture machinery, agricultural implements, etc. The provisional directors include N. Beneteau, G. B. McLeod, and A. L. Thibodeau, Windsor.

The Canadian Ore Concentration, Limited, a British incorporation, have been licensed to carry on a mining and smelting business in Ontario. R. C. Donald, Toronto, is their attorney.

Gerhard Heintzman, Limited, Toronto, have been incorporated with a capital of \$350,000, to acquire the business of Gerhard Heintzman & Co., and to manufacture pianos, organs, etc. The provisional directors include Gerhard Heintzman, A. N. Heintzman, and K. A. Heintzman, Toronto.

Messrs. Taylor & Smart, Limited, Toronto, have been incorporated with a capital of \$50,000, to acquire the business of Robert Taylor, and to manufacture millinery, hosiery, gloves, etc. The provisional directors include Robt. Taylor, D. W. Smart and A. Hutchison, Toronto.

The Goderich Cement Brick Co., Goderich, Ont., have been incorporated with a capital of \$40,000, to manufacture cement, cement bricks, etc. The provisional directors include Geo. Acheson, J. A. McIntosh and Wm. Proudfoot, Goderich, Ont.

The Labor Temple Co., Toronto, have been incorporated with a capital of \$40,000, to afford accommodation for the trades and labor organizations. The provisional directors include Jas. Simpson, A. J. Raynor and J. H. Huddleston, Toronto.

The Stewart, Howe & Meek Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture wearing apparel, etc. The provisional directors include A. J. Stewart, L. F. Howe, New York City, and C. S. Meek, Toronto.

Rhys D. Fairbairn, Limited, Toronto, have been incorporated with a capital of \$50,000, to manufacture dry goods, etc. The provisional directors include R. D. Fairbairn, I. A. Fairbairn and R. B. Henderson, Toronto.

The International Varnish Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture paints, varnishes, etc. The provisional directors include H. Rosenberg, M. Wolf and F. W. Herz, New York City.

The Stratford Chair Co., Stratford, Ont., have been incorporated with a capital of \$60,000, to manufacture furniture, etc. The provisional directors include W. H. Crowe, F. A. Nichols and A. J. McPherson, Stratford.

The Alpena Oil & Gas Co., Chatham, Ont., have been incorporated with a capital of \$100,000, to carry on a mining, milling and reduction business. The provisional directors include S. T. Bell, Alpena, Mich., Thos. Robinson, Romney, Ont., and R. L. Gosnell, Blenheim, Ont.

The Dominion Roller Screen Co., Toronto, have been incorporated with a capital of \$150,000, to manufacture screens, and the Mansell Patent Roller Screen. The provisional directors include F. A. Mansell, J. N. Lynde and C. T. Rodman, Toronto.

The Southern Light & Power Co., Toronto, have been incorporated with a capital of \$300,000, to supply steam, heat, electricity, etc. The provisional directors include F. J. A. Davidson, C. A. Stone and D. A. Dixon, Toronto.

Geo. S. Sinclair & Sons, Limited, Warton, Ont., mention of which organization was made in our last issue, are sending out an announcement of their plans. The company

will at once enlarge their foundry business acquired from the old firm, and engage extensively in the manufacture of the Sinclair Patent Shaft Coupler, the Canadian patents of which are owned by the company. The Sinclair Patent Coupler has passed the experimental stage, and is now firmly established on the Canadian market, and the company have many flattering recommendations from manufacturers. They will also erect and operate a dry dock at Warton. The capital stock of the company is \$40,000.

The Victor Varnish Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture varnishes, paints, etc. The provisional directors include A. C. McMaster, G. R. Geary, and W. P. Brodie, Toronto.

The Imperial Leather Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture leather, leather goods, etc. The provisional directors include C. A. Crawford, T. L. Bryar and H. Hunter, Toronto.

M. A. Piggott, Hamilton, Ont., has been awarded the contract for the construction of about 25 miles of railway for the Canadian Pacific Railway between Guelph and Goderich, Ont.

The Imperial Export Co., Toronto, have been incorporated with a capital of \$100,000, to carry on a warehousing and forwarding business. The provisional directors include W. H. Kimpton, J. P. MacGregor and E. B. Ryckman, Toronto.

The Bertram Engine Works Co., Toronto, will convert the Knapp roller boat into a steam barge. She will be fitted with twin screws and steel ends, her top will be opened and deck and pilot houses built above the plates. She will be employed in the coal-carrying trade.

Mr. F. A. Ritchie, President of the Kinleith Paper Co., St. Catharines, Ont., writes in reference to the accident at the company's mills on August 12, that as the small boiler used for cooking rags under low pressure which exploded was contained in a separate outbuilding, very little damage was done except to that building and the adjoining wall. The two paper machines were not injured. One of them continued running as usual, the other will be in operation in a few days, so that the deliveries of goods will not be interfered with to any extent.

The new boiler and engine room under Victoria Street, in connection with the King Edward Hotel, Toronto, is completed and the surface of the street cleared for traffic. About \$50,000 was spent beneath the roadway, including the cost of engines and boilers.

The Grand Trunk station at Blyth, Ont. was destroyed by fire August 11.

The car barns of the London, Ont., Street Railway and Messrs. Welford Bros.' broom factory were destroyed by fire August 9. Loss about \$35,000.

A seven-story office building will be erected on King Street West, Toronto. The Toronto Star Newspaper Co. will occupy four floors.

The Sandwich County Council have authorized the raising of \$30,000 for the purpose of building half a dozen iron bridges across Belle River, Ont., in different sections of the county.

H. Dixon's foundry at Collingwood, Ont., was destroyed by fire recently. Loss about \$8,000.

J. L. Reaume's stave mill at Essex, Ont., was destroyed by fire July 28. Loss about \$3,000.

In the face of keen American competition, Messrs. C. & W. Walker, Limited, of the Midland Iron Works, Donnington, Salop, have secured from Toronto an order for a steel tank

184 feet diameter by 33 feet deep and a telescopic gasholder of four lifts to be erected in same. The capacity of this holder will be equal to three million cubic feet of gas, and will be one of the largest in Canada. The total amount of the whole contract—i.e., the tank, gasholder, and guide framing, will approach close upon the sum of £30,000. It is said that the balance in favor of the British firm was just turned by the preferential tariff, without which the work would not have come to this country. If the Canadian municipalities would only give British firms the opportunity to tender we should have far more of these trade gains over America to record. Commercial Intelligence.

H. Johnston's planing mills at Essex, Ont., were destroyed by fire recently.

The Galt Knitting Co., Galt, Ont., will enlarge their works.

Messrs. Manion, Graham & Horne, Fort William, Ont., will erect a brick block, 100x70 feet, four stories high.

The Canada Foundry Co., Toronto, have closed a contract with the Canadian Northern Railway for a bridge over the North Saskatchewan and north-west of Battleford, at what is known as the Second Crossing. It will consist of 11 spans, and the total length of the steel superstructure will be approximately 1,570 feet, not including the length of the approaches. The total weight of steel entering into the structure of this bridge will be approximately 3,500,000 pounds.

Contracts for the construction of the James Bay Railway from Toronto to Parry Sound, Ont., have been awarded to Messrs. Mann & Mackenzie.

The Dominion Government will issue regulations governing the payment of the bounty on Canadian crude oil. Each applicant for bounty will have to forward corroborative evidence to sustain his claims from the books of the refinery or other purchaser.

Representatives of the Toledo Shovel Works are making arrangements with the city of Hamilton, Ont., to establish a branch there.

C. Forler will erect a planing mill at New Hamburg, Ont.

Messrs. Currie & Thrasher are building a new saw mill at Deux Rivieres, Ont.

Messrs. H. Cargill & Son, Cargill, Ont., will erect a new planing mill and sash and door factory there.

J. L. Reaume, Essex, Ont., will erect a saw-mill, stave and heading factory at Kearney, Ont.

Hon. Wm. Paterson states that for the year ended June 30, 1904, the sum of \$113,474 had been paid in the form of rebates to the manufacturers of agricultural implements. Of this sum, the Massey-Harris Co. received \$80,380, and the Verity Plow Co. \$10,748.

The Ontario Crown Lands Department have granted the application of the Backus Syndicate of Minneapolis for an extension of time for the completion of the power works at Fort Frances, Ont. The syndicate claimed that they were unable to get a contractor to undertake to complete the work by May 1, 1906, as specified in the agreement, and the Government has now given them until January 1, 1907, when the contract provides that the power of the falls right across the river, which is the international boundary, shall be developed. The syndicate have practically completed arrangements for the erection on the Canadian side of the river of a three thousand barrel flour mill.

Work has been begun on the dredging contract which Dunbar & Sullivan secured from

the United States Government for lowering the channel at Amherstburg Beach, Ont., running from the Lime Kilns Crossing to Bar Point on the Detroit River. The contract was for nearly one million dollars, and it is estimated that the work will require three years for completion. When completed it is expected that this obstruction to navigation, which in high south winds has laid up twenty to thirty boats, will have been overcome, and that vessels of 19 foot draft can pass unhindered.

The new Archives Building to be erected at Ottawa will be a three-story fire-proof structure provided with steel fittings throughout.

The Toronto & Niagara Power Co., Toronto will award contracts for the erection of the new power house and sub-station at Niagara Falls, Ont. The power house will cost \$300,000, and will be 500 feet long, 50 feet high, built of white granite. The sub-station will cost \$100,000. The company will also erect another sub-station on Davenport Road, Toronto, to be 225x80 feet at a cost of \$100,000.

The Consumers' Gas Co., Toronto, have awarded the contract for a gas tank of 3,000,000 cubic feet capacity to Messrs. C. & W. Walker, Limited, Midland Iron Works, England.

The Citizens' League will erect a temperance hotel at Toronto Junction, Ont., at a cost of \$12,000.

Mr. Galt, Toronto, the engineer in charge of the pneumatic tube system, was in Ottawa recently, and in an interview with the Postmaster-General he submitted specifications for iron piping, which were approved of, and tenders will be invited at once, both for Toronto and Montreal. The piping will have an inside diameter of 10 inches.

The Marconi Wireless Telegraph Co. of Canada announce that they will transmit messages to incoming and outgoing steamships from the following stations on the Gulf: Fame Point, Heath Point, Point Amour and Belle Isle. The following ships of the Allan Line are fitted with wireless appliances: Bavarian, Tunisian, Parisian, Virginian, and Victorian, the two latter being now under construction.

The Dominion Government will establish an ammunition factory at or near Ottawa, with a capacity of ten million rounds a year, and later similar factories will be erected in Manitoba and British Columbia.

Contracts have been awarded for the erection of the new St. George's Hall in Ottawa, at a cost of \$20,000.

The Canadian Folding Collapsible Box Co., Brantford, Ont., recently organized, are installing new machinery and will commence operations shortly.

The Bertram Engine Works Co., Toronto, have recently constructed a ferry steamer, called Tom Fawcett, for the Wolfe Island Township Council. Her dimensions are 133x33 feet, with compound engines 13x26x36 inches and Scotch return tubular boiler 9x8 feet.

The Bertram Engine Works Co., Toronto, are building an iron ferry steamer for St. John, N.B.

The Consumers' Gas Co., Toronto, have increased their capital from \$2,000,000 to \$3,500,000, to be spent on improvements to their plant including the new tank of 3,000,000 cubic feet capacity and a gas plant.

The Grand Trunk Railway Co. will erect a series of new shops at Stratford, Ont., at a cost of \$170,000. The buildings are to be

erected and the machinery installed by December 15.

Charles Hopewell, of Ottawa, purposes establishing a sash and door factory in Winnipeg, Man.

John Todd, Collingwood, Ont., will establish a box factory in Owen Sound, Ont.

The total number of vessels on the registry books of the Dominion on December 31, 1903, including old and new vessels, sailing vessels, steamers and barges, was 7,020, measuring 683,147 tons register tonnage, being an increase of 184 vessels, and an increase of 30,534 tons register as compared with 1902. 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 per ton, the value of the registered tonnage of Canada on December 31 last would be \$20,491,410. The number of new vessels built in the Dominion of Canada during the last year was 328, measuring 30,323 tons register tonnage. Estimating the value of the new tonnage at \$45 per ton, it gives a total value of \$1,364,535 for new vessels. The 7,020 ships and steamers are divided by Provinces as follows: Ontario, 1,778; Quebec, 1,288; Nova Scotia, 2,069; New Brunswick, 969; British Columbia, 639; Prince Edward Island, 164; Manitoba, 139; Yukon, 14.

City Engineer Rust, Toronto, is preparing plans and estimates for a sea wall from Sunnyside to the Humber River to protect the Lake Shore road. What he proposes is a wall of concrete close to the shore line sunk four feet in the sand and rising two feet above the water. It will be five feet across at the base and two feet at the top. It will necessitate a cofferdam. Mr. Rust said that that would necessitate building the wall 200 feet from the shore. At present the water at that distance from the shore is six feet deep.

The Government breakwater along the south shore of Toronto Island is to be extended west another 1,000 feet at a cost in the neighborhood of \$40,000. Major Grey, resident Government engineer, has received instructions to proceed with the work at once. The extension will afford protection for that portion of the Island shore that was so badly damaged by storms this season.

The Imperial Lumber Co., Toronto, have under consideration the establishment of a saw mill and lumber yards at Owen Sound, Ont.

Messrs. Fleming & Ferguson, an English firm, have been awarded the contract for the construction of an ice-breaker steamer for the Lower St. Lawrence River at a cost of \$272,500. The dimensions are to be 200 feet long, depth 18 feet, and breadth 43 feet. There will be two sets of triple expansion engines.

Two new industries will be in operation along the northern line of the Grand Trunk Railway within a few weeks. The new building of the Dominion Linen Mills at Bracebridge, Ont., is completed, and the machinery is all installed. The factory of the Clarke Mfg. Co. at Gravenhurst, Ont., is nearing completion, and some of the machinery is already in place. The concern will manufacture all kinds of dental supplies and dentists' and barbers' chairs. Dr. Beattie Nesbitt, M.P.P., Toronto, is president of both companies.

The town of Orillia, Ont., have awarded to Joseph Battle, of Thorold, Ont., the contract for the erection of a wooden dam at Ragged Rapids, the work to be completed and electric power supplied by the 15th of October.

The J. I. Case Threshing Machine Co., Racine, Wis., will establish a branch works at Sault Ste. Marie, Ont., giving employment to about 500 men.

A public school building will be erected at Rainy River, Ont., at a cost of \$25,000.

The power house connected with the Hamilton, Ont., Street Railway circuit at Beamsville, was struck by lightning and burned August 13.

The Royal Canadian Yacht Club house at Toronto Island was destroyed by fire August 15. Loss about \$15,000. Rebuilding operations will commence at once.

The Public Library Board of the town of Listowel, Ont., have accepted the plans of H. R. Barber, architect, for a library building to be erected in cement, at a cost of \$10,000.

The Grand Trunk Railway Co.'s new elevator with a capacity of 1,500,000 bushels, now being constructed at Montreal will be completed before the beginning of next season and will bring the total elevator capacity of that port to 6,500,000 bushels.

The Dominion Wire Mfg. Co., Montreal, have been awarded the contract for the erection of two wires that will transmit 70,000 h.p. from the plant of the Toronto & Niagara Power Co., at Niagara Falls, Ont., to Toronto. The contract is for 1,500,000 pounds of copper cable. Six cables will be strung on steel towers forty feet high, and situated 400 feet apart. The carrying out of the work will cost about \$250,000.

The Railway Spring & Supply Co., Montreal, have been incorporated with a capital of \$49,000, to manufacture railway supplies, machinery, etc. The provisional directors include Jas. Rogers, C. Coughlin and J. A. Rowan, Montreal.

Messrs. Babcock & Wilcox, Montreal, have been awarded the contract for the supply of three new boilers for the low level pumping station, that city, at a cost of \$15,530.

Messrs. Pillow & Hersey's rolling mills at St. Henri, Que., were damaged by an explosion August 9.

W. Comstock's sawmill, T. W. Gold's handle factory and J. W. Tilton's shingle mill at Mack's Mills, Que., were destroyed by fire August 6. Loss about \$15,000.

Messrs. Girard & Godin's coffin factory at Three Rivers, Que., was destroyed by fire recently. Loss about \$40,000.

The Shawinigan Construction Co., Shawinigan Falls, Que., have been incorporated with a capital of \$20,000, to acquire the business of A. Heon & Co., and to manufacture building materials, etc. The provisional directors include V. Burrill, J. B. B. Leman and A. Heon, Shawinigan Falls, Que.

The Dominion Government will erect a new branch post office in Montreal at a cost of \$75,000, and will also spend \$55,000 for the installation of pneumatic tube system between the main and branch office, and \$25,000 for improvements in the general post office building.

The Grand Trunk Railway Co., Montreal, have on file plans and specifications for the equipment of their tunnel lines with electricity. The third-rail system has been decided upon as most efficient; estimates place the cost of the change at \$400,000.

The first of the ten locomotives which the Grand Trunk ordered a few months ago from the Montreal Locomotive & Machine Co., have been turned out. They are of the large ten-wheeled type, and will be used for passenger traffic.

The Montmorency Cotton Co., Montmorency Falls, Que., will erect a bleaching plant at a cost of \$50,000.

The Levis County Railway Co., Levis, Que., will install a steam plant of 500 h.p. in a

location along the river, giving ample water and coal facilities. A battery of 500 h.p. of Babcock & Wilcox boilers will be erected, and a 350 h.p. Robb compound condensing engine will be installed. The intention is to belt from the engine to one of the two motor-generator sets of 250 k.w. each, removing for this purpose the alternating current end.

The St. Johns, N.B., Street Railway Co., have made some improvements and addition to their plant. A horizontal cross-compound condensing Corliss engine has been installed, also a new 600 k.w. direct-connected generator, supplied by the Canadian General Electric Co., Toronto. The company retains, in addition to this new equipment, all the other machinery which was used in the street railway service, and also own the electric lighting plant.

An effort is being made to revive interest in the Maritime Sulphite Fibre mill at Chatham, N.B. At a recent public meeting of the citizens it was decided to offer absolute exemption from taxation to any one who will operate the mill.

The McAdenite works at St. John, N.B., will be re-opened and a considerable quantity of new machinery installed. The chief plant of the McAdenite Metal Co., is at New Brighton, Staten Island, N.Y., but a profitable business is expected to be worked up in Canada.

The Department of Public Works, Fredericton, N.B., are inviting tenders for the re-building of Dunbar Bridge, at St. Mary's, N.B.

The Moncton Wood Working Co., Moncton, N.B., have been incorporated with a capital of \$8,000, to manufacture shingles, sashes, doors, etc. The provisional directors include J. M. O. Steeves, F. Bishop and J. A. Bishop, Moncton.

The Victoria Acetylene Mfg. Co., Hampton, N.B., have been incorporated with a capital of \$25,000, to manufacture gas machines, generators, etc. The provisional directors include Jas. H. Whitman, Port Dufferin, N.S., Jas. Hunter, St. John, N.B., and J. Heaton, Hampton, N.B.

The new plant of the Maritime Nail Works at St. John, N.B., is now in operation. The company are installing two chemical tanks of 110 gallons capacity each for fire protection.

C. M. Sherwood is erecting a flour mill with a capacity of 100 barrels at Centerville, N.B.

New Glasgow, N.S., is calling for tenders for laying 20,000 lined feet of water pipe. Good progress is being made with the construction of the Springhill water service and the contractors expect to have the system completed at an early day.

The Halifax, N.S., City Council, have decided to engage an expert waterworks engineer to go over their system and report on the most feasible way to increase the water supply.

The first kiln of firebrick has been turned out at the new plant of the Intercolonial Coal Mining Co. at Westville, N.S. This is the first fire brick to be manufactured in Canada from native clay, and in case the product proves satisfactory a new and important industry will be inaugurated.

The Wellman-Seaver-Morgan Co., Cleveland, Ohio, have been awarded the contract for building the large rail mill to be installed by the Dominion Iron & Steel Co. at their works at Sydney, N.S. The Wellman-Seaver-Morgan Co. are also carrying on extensive work in Nova Scotia for the Nova Scotia Steel & Coal Co., being engineers for their new steel

works, and in addition constructing an extensive ore handling plant, which is equipped with the company's latest design of ore handling cranes, etc.

At the recent session of the Dominion Parliament the following amounts were voted for equipment on the Prince Edward Island Railway: For applying Westinghouse air brakes and air signals, \$35,500; to fit up locomotives and passenger cars for steam heating, \$14,500; to apply couplers to rolling stock, \$26,500.

A report from St. Johns, Nfld., states that Sir Alfred Harcusworth and a number of newspaper proprietors of London, Eng., have closed negotiations for 1,500 square miles of timber areas in the interior of Newfoundland on which they propose to erect a large pulp mill.

A new pier 750x50 feet is under construction for the Dominion Government at Halifax, N.S. When the work is completed it will join together piers 8 and 9, thus giving a width of 125 feet for some distance from the shore and 90 feet for the remainder of the distance. A shed 650x50 feet wide and 30 feet high will be constructed on the pier.

The supplementary estimates contain \$150,000 for double tracking the Intercolonial Railway between Rockingham and Bedford, N.S., a distance of four miles.

McNeil Bros., New Glasgow, N.S., propose erecting an iron working plant at Port Hawkesbury, N.S., at a cost of \$35,000, and give employment to about 50 men on the condition that a bonus of \$5,000 be given and the plant be exempted from taxation for a term of years.

Messrs. McLaughlin & Ellis' elevator at Cartwright, Man., was destroyed by fire July 17.

Senator Gustavus Thelen, Minneapolis, Minn., representing an American syndicate, has been in Calgary, N.W.T., in connection with the establishment of a beet sugar factory there which will cost about \$800,000.

The School Board at Arisa, N.W.T., are inviting tenders for the erection of a new school house.

Messrs. Knittle & Dunbar, Carlyle, N.W.T., will enlarge their hotel building.

Revilion Freres, Edmonton, N.W.T., are inviting tenders for the erection of a new warehouse.

J. H. Keam, Moose Jaw, N.W.T., will erect a large addition to the Maple Leaf Hotel.

A Catholic church building and manse will be erected at Vegreville, N.W.T.

The Manitoba Construction Co., Winnipeg, Man., have been awarded the contract for the erection of the new immigration hall at a cost of about \$200,000.

The Canadian Pacific Railway oil sheds at Brandon, Man., were destroyed by fire a few days ago.

A number of additions and improvements are being made to Dow & Curry's oatmeal mill at Pilot Mound, Man. A new dry kiln is in course of construction and an elevator will be built.

The Brackman-Kerr Milling Co., will construct an additional elevator at Edmonton, N.W.T., which will bring the storage capacity at that point up to over 500,000 bushels. The new house will be built of steel and brick.

Tenders are being invited for a new Canadian Pacific Railway round house at Regina, N.W.T.

The Sheppard-Macdougall Co., Winnipeg,

Man., have been incorporated with a capital of 100,000, to manufacture cloth, furs, dry goods, etc. The provisional directors include E. L. Howell, C. S. Richardson, and J. W. B. Macdougall, Winnipeg.

The Williams Quarry Co., Winnipeg, Man., have been incorporated with a capital of \$100,000, to manufacture lime, cement, etc., and to carry on a general contracting business. The provisional directors include A. Davidson, J. Williams and J. Dolmer, Winnipeg.

The Greek Catholics of Winnipeg, Man., will erect a church building at a cost of \$25,000.

The city of Winnipeg, Man., is inviting tenders for the supply of a new fire apparatus.

D. Hamilton will erect a hotel building at Neepawa, Man. at a cost of \$30,000.

The Albion Iron Works at Victoria, B.C., were badly damaged by fire August 9. Loss about \$150,000.

The Neptune Salvage Co., Tacoma, Wash., have begun operations to raise the wreck of the Canadian Pacific steamer Islander, which was wrecked in the channel between Douglas Island and the mainland, Alaska, some years ago. Salvage operations are being conducted in a conical diving bell which is said to work without discomfort in sixty fathoms of water.

The British Columbia General Contract Co., have been incorporated at Victoria, B.C., with a capital of \$50,000, to construct railroads, bridges, buildings, etc.

The International Roller Bearing Co., have been incorporated at Victoria, B.C., with a capital of \$125,000, to acquire the Kincaid Patent Roller Bearings and to manufacture same.

The Green City Mining & Improvement Co. have been incorporated at Victoria, B.C., with a capital of \$100,000 to carry on a mining, milling and reduction business.

The Ross & Howard Ironworks Co., Vancouver, B.C., have been incorporated with a capital of \$250,000, to acquire the business of Ross & Howard, and to manufacture mining, milling and canning machinery, etc.

The North Star Lumber Co., Cranbrook, B.C., will erect a new planing mill.

The Fernie Lumber Co., Fernie, B.C., will construct a logging railway at a cost of \$2,000.

J. A. Sayward, Victoria, B.C., will erect a band saw mill of 100,000 feet daily capacity.

The Standard Lumber Co., Mayook, B.C., purpose erecting a new saw mill with a capacity of 50,000 feet per day, at Fort Steele Junction, B.C.

James Muirhead, of the Victoria Planing Mills, Victoria, B.C., will erect an addition to his wharf and install additional plant in his mill.

A report from Rossland, B.C., to the Nelson News says, the Canadian Smelting Works, Trail, B.C., will establish a new industry by manufacturing the completed lead products. The machinery is at the smelter to manufacture lead pipe and plans are being prepared for sheet lead machinery. Contracts are about to be closed for corrodng works, to be located in Montreal, with the probability of a small branch corrodng plant at Trail for the Western market. The total cost for the manufactories is about \$100,000.

The British America Dredging Co., Pine Creek, Adm, B.C., will operate two dredges on the Adm leases at a cost of \$500,000.

The Crows Nest Pass Lumber Co., Wardner, B.C., purpose erecting a shingle mill with a capacity of 150,000 shingles a day, and a sash

and door factory to work up their high grade material.

The Bank of Commerce, Fernie, B.C., are inviting tenders for the erection of a new two-story banking building.

The Trites Wood Co., Fernie, B.C., will erect a stone block of buildings 114x90 feet.

The Grandby Mining & Smelting Co., Grand Forks, B.C., will spend \$100,000 in additional mine equipment.

The total tonnage of copper matte blister copper, lead bullion, and pig lead shipped from British Columbia during June was 2,646 tons.

The Elk Lumber Mfg. Co.'s Mills across the Elk River from Fernie, B.C., were destroyed by fire recently.

The Georgia Rock Co., have been incorporated at Victoria, B.C., with a capital of \$10,000, to excavate granite, marble, limestone, gravel, etc.

The Washington Cedar Lumber Co., Ballard, Wash., will erect a large lumber mill on Clayoquot Sound, B.C.

McLachlan Bros., Limited, Vancouver, B.C., have been incorporated with a capital of \$25,000, to acquire the business of McLachlan Bros., and to manufacture hardware, cutlery, etc.

The British Columbia Box Co., have been incorporated at Victoria, B.C., with a capital of \$25,000, to manufacture wooden ware, packing boxes, crates, etc.

The Valkyrie Packing Co., Limited, Gabriola Pass, B.C., have been incorporated with a capital of \$25,000, to acquire the business of Valkyrie Packing Co., and to carry on a fish and fruit packing business.

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.

Mr. H. H. Witherspoon, jr., compressed fuel expert, who has made extensive tests of peat for fuel purposes has been connected with the Peatcoal Co., 30 Broad street, N.Y.

During the year ending June 30, 1904, the imports of bituminous coal into Canada from the United States amounted to 4,434,762 tons, a gain of 720,120 tons over the preceding year. During the same time the imports of anthracite increased from 1,370,752 tons to 2,022,810 tons. The exports of Canadian bituminous coal to the United States for the year ending June 30, amounted to 1,317,979 tons.

An official statement of coal output in the United States during 1903 shows 285,107,392 tons bituminous, an increase of 24,890,548 tons over the previous year, and 74,313,919 tons anthracite, a gain of 32,940,324 tons over 1902. The total of 359,421,311 tons is about double the production ten years ago, and the increase alone over the previous year was equal to the total yield twenty-five years ago.

The Grand Valley Peat Products, Limited, Toronto, have been incorporated with a capital of \$200,000, to manufacture peat, peat fuel, etc., and to carry on a mining, milling and reduction business. The provisional directors include J. C. Steele, Newtonbrook, Ont., W. D. Farney and W. H. Jackson, Toronto.

The Canadian Low-Coke & Gas Co., Mon-

triel, have been incorporated with a capital of \$1,000,000, to manufacture by-products of gas, coal and coke, also machinery and supplies, etc. The provisional directors include A. W. G. Macalister, Wm. J. Henderson and W. G. Mitchell, Montreal.

The St. Lawrence Coal Co., Montreal, have been incorporated with a capital of \$500,000, to mine and refine coal, coke, iron, etc. The provisional directors include Jas. Robinson, G. A. Forbes and C. Brandeis, Montreal.

Hon. E. J. Davis, Commissioner of Ontario Crown Lands, has replied to a communication from Guelph and Toronto trades and labor bodies calling his attention to the probable existence of coal areas in Ontario, and pointing out the necessity of protecting them from monopolists. Mr. Davis, in reply, says "the Department is on the alert with reference to coal discoveries. Last year we sent out a special party to various sections of Northern Ontario, where we had reason to believe there might be a possibility of finding coal. The result was that we obtained a great deal of information and the indications are that there are coal deposits of more or less magnitude in the northern portion of the Province, but there are some doubts as to whether it will be anthracite of the best quality. However, until our railway system is extended further it would be difficult to thoroughly develop and make accessible such deposits as there may be. You can rest assured that no effort will be omitted in order to discover any deposits of coal that there may be. If valuable discoveries are found and become accessible, I feel quite confident the Government will provide such regulations as in the public interests will prevent monopoly."

THE WINNIPEG FAIR.

Among the well-known manufacturing concerns in Ontario and the East who exhibited at the Dominion of Canada Exhibition at Winnipeg, Man., may be mentioned the following: Canadian General Electric Co., Canada Foundry Co., Gurney Foundry Co., Metallic Roofing Co., Pease Furnace Co., Henderson Roller Bearing Co., Independent Cordage Co., Siebe Gas Co., and A. R. Williams Machinery Co., Toronto; Goldie & McCulloch Co., and Shurley & Deitrich, Galt, Ont.; Canada Radiator Co., Port Hope, Ont.; Western Foundry Co., Wingham, Ont.; Doherty Mfg. Co., Sarnia, Ont.; Penberthy Injector Co., Windsor, Ont.; Jas. Smart Mfg. Co., Brockville, Ont.; Canadian Heating & Ventilating Co., Owen Sound, Ont.; W. J. Copp, Sons & Co. and Record Foundry & Machinery Co., Fort William, Ont.; Canadian Steel & Wire Co., Hamilton, Ont.; Canada Horse Nail Co., and Mica Boiler Covering Mfg. Co., Montreal; Robt Engineering Co., Amherst, N.S.; Monroe Wire Works, New Glasgow, N.S., and Enterprise Foundry Co., Sackville, N.B.

A LARGE BELTING CONTRACT.

The Rosendale Belting Co., Manchester, England, whose Canadian headquarters are located at 59-63 Front Street East, Toronto, and are in charge of Mr. L. J. Rowland, have just received one of the largest belting contracts recently awarded by Canadian firms, and probably the largest contract ever made, by a Canadian Portland cement company. The order was secured by the Toronto office of the company, and is from the Vancouver Portland Cement Co., Vancouver, B.C., and calls for 3,000 feet of "M.A.Y." Rosendale belting, ranging in width from four inches to 60 inches, including single, double and triple strength belting, also four ply carrying belts and belt fasteners. This consignment will be

shipped from the factory in Manchester direct to Vancouver, via Suez.

The Toronto offices of this company have been in existence but little more than a year, during which time their line of belting has been introduced in several hundred Canadian manufacturing establishments and is giving the best possible results. The success of this Company in Canada aptly illustrates the opportunities for English manufacturers in this field when their efforts are directed in the proper channels, and live representatives are placed in charge of their business.

A MODERN SMELTER.

One of the most modern smelter plants in Canada or the United States is the new 1,000 ton smelter of the Canadian Copper Co., now in operation at Copper Cliff, Ont.

There were several objects that had to be borne in mind in this work, among them the cheap handling of a large tonnage of ore, the storage during the winter months of coke and coal, which can be received by boat during summer; the elimination of all needless manual labor, and the thorough efficiency of the power department. The plant was designed to be erected on two levels; the large amount of slag produced had to be taken into consideration, and the disposition of this slag was an important factor in determining the site. The plant, as it now stands, was built along the face of a cliff on the northern side of the deep valley in which the town of Copper Cliff stands.

The problem was to take the roasted pyrrhotite from roast heaps and convert it into 80 per cent. matte, the presence of nickel precluding the advisability of a higher concentration.

On the upper edge of the cliff a system of bins had been constructed for storage purposes. The smelter building proper is situated parallel to these bins with the power house at the eastern end. A trestle was built on the grade level of the bottom of the bins, which is also the grade level of the charging floor, connecting the charging floor with the bins and also with the power house, making a circular track, without switches, running on both sides of the furnaces, and passing the coal chute in front of the power house, which leads directly into the boiler room.

The scheme of operation is as follows: Three miles from the plant is the largest mine. The ore is taken from this mine to the roasting beds, which are about one-half mile from the smelter. After roasting, the ore is loaded into hopper-bottom cars and drawn up to the top of the bins. The track leading to the top of the trestle is on an easy grade all the way, and is also connected with the main track leading to the Canadian Pacific Railway.

All ore, flux, coke, coal, etc., is handled on these tracks and dumped directly into the bins. Running on the circular track underneath the bins and into the smelter building and past the power house is an electric railroad, with side-dumping cars drawn by electric locomotives. The ore, coke, etc., is loaded into these cars, weighed on the end of the trestle, and dumped into the coal chute next to the power house. All trains are kept

moving in one direction, and there is no switching or cross-over.

The site consists of two levels with a difference of 35 feet in elevation. The upper level is the same elevation as the feed-floor, and is occupied by a double track pocket trestle 32x34x 600 feet. The storage pockets were made to hold enough coal to last over the period of closed navigation, coal being received by boat at a nearby port on Georgian Bay, as well as coke, ore, silica and clay.

On the lower level are located the power house, 156x102 feet; the blast furnace building, 282x54 feet; the foundations for the trestle carrying the electric tramway, connecting the storage pockets with the feed-floor; the coal bins of the boiler room; the dust chamber 444 feet long, 16 feet wide, and 18 feet high; the stack, 15 feet inside diameter, 210 feet high; together with the necessary slag tracks, sunken tracks for loading metal for shipment, tracks to storehouse, etc.

The power house is equipped with two horizontal, cross compound, condensing blowing engines with steam cylinders 13 inches and 24 inches by 42 inches, and air cylinders 57 inches and 57 inches by 42 inches. When operating under usual working conditions, these engines will deliver 20,000 cubic feet of free air per minute against a pressure of 40 ounces for use in the blast furnaces. One horizontal, cross compound, condensing, blowing engine, with steam cylinders 15 inches and 30 inches by 42 inches, and air cylinders 40 inches and 40 inches by 42 inches. This engine will deliver 10,000 cubic feet of free air per minute against a pressure of 15 pounds for use in the converters. Two 13 inches and 26 inches by 20 inches horizontal compound condensing engines built by the Robb Engineering Co., Amherst, N.S., to each of which is directly connected one 200 k.w. 600-volt 3-phase alternating current generator, built by the Canadian General Electric Co., Toronto, each generator having its own exciter of 11 k.w. capacity, belt driven from generator shaft. The electrical energy thus generated is used for hoisting and pumping at the mines, operating the electric tramway for charging cars, turning the converters, and operating the travelling crane in furnace building. The station is also equipped with one 25 k.w. motor-driven generator set, for furnishing direct current to the electric locomotives. A travelling crane of ample capacity is installed in the engine room for handling all this apparatus. A gravity oiling and oil filtration system is installed on all engines.

In the boiler room the present installation of boilers consists of four 400 h.p., 150 pounds pressure, horizontal water tube boilers, and space is provided for two more boilers of the same size.

Coal is brought to the power plant by the electric locomotive train above referred to, and dumped into bins built in trestle along the west side of building. Thence it runs through coal chutes to one-half ton coal cars in boiler room, from which cars it is shoveled into boiler furnaces.

The only available water for boiler use contains considerable sulphuric acid and scale-forming elements, and, to eliminate these, the water is subjected to a chemical treatment and precipitation in a water purifying system. In this way the acid is neutralized, and the scale-forming material is removed before the water enters the boilers. The condenser is of the elevated barometric type.

The blast furnace building contains two Holthoff copper blast furnaces; three stands for Holthoff converters; one 40-ton electric crane; the necessary matte settlers, clay mills, silica and clay storage bins, etc. Room is provided for expansion.

In operation the ore, coke and flux for blast furnaces, silica and clay for lining converters and coal for boilers is delivered into the top of the trestle pockets by standard gauge cars—Ingoldsby side-dumping in the case of ore—and drawn from the bottom of the pockets into trains of six 2-ton, 86 inch gauge, side-dump Koppel cars, which are hauled to the blast furnace, silica and clay storage bins or coal bins, by 25 h.p. Canadian General Electric Co., electric locomotives. When feeding the blast furnaces, a train of six cars is made up of four cars containing two tons of smelting mixture, and two cars, each containing the proper amount of coke to go with four tons of charge.

The slag and matte runs from the blast furnace into 16-inch settlers, the slag overflowing into 225 cubic feet capacity cinder cars, which are hauled to the dump by standard gauge locomotives. The matte is tapped into 10-ton cast steel ladles and taken to the converter by a 40-ton electric crane. The same crane removes to the converter shells for relining, and takes care of the converter slag and white metal, pouring them into moulds for return into the pocket trestle, or for shipment to the refinery. The coal bins at the boilers and the silica and clay bins at the clay mills are kept full by six car train loads of material.

The flue dust is drawn from the dust chamber into a standard gauge, bottom dump gondola especially fitted for the service, and this car is hauled to the top of the pocket trestle on the upper level and the dust drawn into a pocket fitted for the purpose, whence it is drawn to a briquetting machine, pressed into briquettes and added to the charge.

The electric tramway consists of two parallel 36-inch gauge tracks running under two lines of grates under the pocket trestle, then over suspension scales to opposite sides of the furnaces on the feed-floor level, passing over the top of the boiler room, coal bins and converter lining house, silica and clay bins. The two tracks have cross-over connections, but under normal working conditions each track carries a train entirely independent of the other.

The blast furnaces are 201 by 50 inches inches at the tuyeres; 14 feet 9 inches from centre of tuyeres to the feed-floor, and have on each side four lower jackets, each 51 inches wide and 8 feet 6 inches high, and two upper jackets 8 feet 6 inches wide and 6 feet high.

Each lower side-jacket carries four 6-inch tuyeres. Both ends of the furnace are made alike, so that either end can be used for removing matte and slag. There is no brick work under the deck beams. The converters are 81 inches by 126 inches, and are tilted by a train of gears and a worm, driven by the electric motor.

The water for the plant is supplied by a 16-inch diameter pipe running from a dam situated about 5,000 feet from the plant itself. The water is run by gravity into the jackets, and when drawn out is pumped into a tank above the smelting plant for fire purposes, or into the reservoir, which is near the foot of the plant, and the hot water is also used in the boilers in order to economize at that point.

WANTED.

Manufacturers and others in need of machines, 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 enquiries kindly mention The Canadian Manufacturer.

RUTILE. The American Rutile Co., Pacific Building, Washington, D.C., desire correspondence with Canadian concerns who will manufacture a ferrotitanium alloy out of their rutile. They manufacture high-grade rutile concentrates for titanium alloys, mordants, pigments, etc.; in iron and steel, enameling, electrical, dyeing, etc.

The G. B. Perry Knitting Co., Hamilton, Ont., are doubling their capacity and desire to hear from parties having good secondhand machinery for sale. They make women's and children's cotton and wool ribbed underwear, and now operate 10 latch needle machines and 10 sewing machines.

The city of Victoria, B.C., advertises for tenders for 12,000 feet of cast iron pipe to be delivered in Victoria on or before May 1, 1905. The tenders, sealed, endorsed "Tenders for Water Pipes," and addressed to W. W. Northcott, purchasing agent, City Hall, Victoria, B.C., must be received before 3 p.m. on Monday, September 12, 1904. Competition is open to all, but the city advertises that the lowest or any tender will not necessarily be accepted.

FACTORY LOCATIONS.

The following Canadian municipalities are offering inducements to secure manufacturing establishments. Inquiries should be addressed to the Mayor, Town Clerk or Board of Trade of the respective cities:

Brantford, Ont.
Hamilton, Ont.
Lindsay, Ont.
Orillia, Ont.
Peterboro, Ont.
Sherbrooke, Que.
Stayner, Ont.
Toronto, Ont.

INDUSTRIAL 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 Turner Brass Works, manufacturers of improved mechanical appliances, Franklin and Michigan Streets, Chicago, announce that they have purchased from the White Mfg. Co., that city, that portion of their business pertaining to blow torches, furnaces, brazers, ovens, etc., together with the trade mark "Hot Blast" and all the patents under which these goods have been made. The Turner Co. have also secured the services of Mr. Robert Kerr, former manager of the White Co., who will have charge of these departments.

In a few weeks the Federal Department of Mines will issue a beautifully illustrated and exhaustive report on the smelting of iron ores by the electric process and the manufacture of iron and steel. Dr. Hamel, Superintendent of Mines, will give a general outline of the work done by the commission in their recent visit to Europe and will also describe the furnaces used in European processes. Mr. Brown, who was electrician to the commission will make a detailed statement on the cost and consumption of electric energy in the processes inspected. Professor Harbord has prepared the metallurgists' report on the quality of the steel produced by the electric process, which will be of a highly favorable character. The volume will likewise contain a special report by the commission which investigated the Marcus Ruthenburg process for the electric smelting of magnetite at Lockport, N.J.,

in July, 1903. There will also be an appendix containing important papers on the subject of electro-metallurgy of steel and iron by Hamel and Stissano, and of copper by Vattier.

The Borden & Selleck Co., Chicago, engineers and manufacturers of coal handling machinery for coal mines, coal yards, docks and power houses have issued a catalogue of their complete line of machinery, which they will be pleased to mail to those contemplating such installations. Among the Canadian coal handling plants equipped by this company are two yards of the Elias Rogers Co., in Toronto and one in Hamilton, Ont., and the plant of the Montreal Gas Co., Montreal.

The Packard Electric Co., St. Catharines, Ont., are issuing a series of monthly calendars in the shape of blotters. Those for August illustrate the Packard lamp and type "G" meter.

The latest folders of the Canadian General Electric Co., Toronto, refer to connectors for motor leads, and Haycox electric car signals.

The McKelvey Concrete Mixer, manufactured by W. A. McKelvey, Toronto, is described and illustrated in a catalogue recently issued by him. This machine is now in wide use by manufacturers, contractors and others interested in the building trades throughout Canada.

The Jeffrey Mfg. Co., Columbus, Ohio, represented in Canada by The A. R. Williams Machinery Co., Toronto, have issued a booklet of instructions for the care and operation of direct current electric generators.

The Canadian Westinghouse Co., Hamilton, Ont., have issued a folder on Westinghouse direct current fan motors. Another folder describes Westinghouse M. P. lightning arresters.

The Penberthy Injector Co., Windsor, Ont., have issued their catalogue No. 21, in which is fully described and illustrated the extensive lines of injectors, ejectors, water gauges, steam gauges, lubricators, and other steam specialties manufactured by them. A prominent feature of the catalogue is the "Penberthy" trade mark which appears on nearly every page. This catalogue is of interest to every power user, and can be obtained from the Penberthy Injector Co., Windsor, Ont., or their eastern agents, the Laurie Engine Co., Montreal.

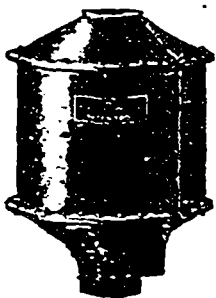
The Steel Square Pocket Book, By Dwight L. Stoddard, 109 pages, 112 illustrations, 32mo, cloth. Price, 50 cents. New York: The Industrial Publication Co. The book is entirely different from any other book on carpentry previously issued by this company, as it is more of a reference book. It is a compact volume, and in its 109 pages is crammed more information than is contained in some books ten times its size.

The Worthington steam-hydraulic accumulator is described in Bulletin 100, published by Henry R. Worthington, 114 Liberty Street, New York City. This device consists of an ordinary steam cylinder combined with a ram cylinder similar to that of a weighted hydraulic accumulator and is applicable to all purposes requiring the storage of water under high pressure. Its advantages over the weighted accumulator are that it is cheaper and occupies less room, and is free from the shocks and fluctuations of pressure due to the momentum of the heavy weights used on weighted accumulators. For further information address the John McDougall Caledonian Iron Works Co., Montreal.

The Sunbeam Incandescent Lamp Co., Toronto, are distributing an advertising novelty in shape of a perpetual pencil which is

That Incessant Spraying

and dripping of water and oil from the exhaust pipe, which rots, rusts and does other damage to roofs and walls,



CAN BE STOPPED BY THE BURT EXHAUST HEAD

It is the most perfect head made. Sent anywhere on approval.

"The Burt Exhaust Heads have fully come up to our expectations. These expectations were very high."

SELMA (ALA.) WATER CO.

THE BURT MFG. CO.

LARGEST MFRS. OF OIL FILTERS IN THE WORLD.

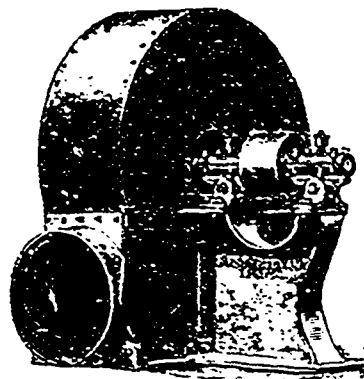
212 Main Street, AKRON, OHIO, U.S.A.

A complete stock carried by the FAIRBANKS CO., Montreal.

Supplied also by Oil Companies, Engine Builders and Power Contractors.

Sturtevant Exhausters

Reduce the Cost of Conveying Light Materials.



The shells are of steel plate of such thickness as to withstand the abrading action of the material. A cast-iron support attached to the side of the shell carries the continuous oiling boxes with the shaft and pulley, and sustains the entire strain. The fan wheel is overhung upon the end of the shaft, thus leaving the inlet entirely unobstructed for the free passage of the material to be handled. They are suitable for conveying chips, shavings, sawdust, wood pulp, tan, etc. Special fans are built for conveying wool, cotton, lint and similar fibrous materials.

B. F. STURTEVANT CO.,

Boston, Mass.

New York. Philadelphia. Chicago. London.

much prized by business men. It will be sent to any reader of this journal interested in electric lamps.

The Minister of Inland Revenue is having prepared a large map upon which the tables of the metric system will be displayed. Copies will be sent to the educational institutions, so that the youth of the country may be taught the system. A bill for the adoption of the metric system in Britain is before the House of Lords, and Canada may have to introduce a similar law at no distant date.

Wm. B. Scaife & Sons Co., Pittsburg, Pa., are sending to the trade a copy of a technical address delivered before the Engineers Society of Western Pennsylvania by J. C. W. Greth, M.E., on the "Softening and Purification of Feed Water for Boilers," and which contains useful information for stationary engineers and owners of power plants.

That the B. F. Sturtevant Co., Boston, Mass., who have recently moved to their new office and works at Hyde Park, Mass., are to press the sale of their economizers is evidenced by the new economizer catalogue which they have recently issued. This catalogue contains the details of the Sturtevant Standard and Pony types of economizers in comparison with those of other makes, the advantages, sizes, weights, accessibility, repairing, etc. It also treats of the subject of mechanical draft and natural draft, and is of interest to all steam users. It may be obtained by any one interested in the subject.

The Shipway Iron, Bell & Wire Co., Toronto, have removed their factory and offices to the north side of Richmond Street East where larger quarters have been secured. The company manufacture ornamental iron work, wire work, and fire escapes, etc., and now employ about 35 men.

PERSONALS.

The Emerson Steam Pump Co., whose main office has heretofore been in Washington, D.C., have removed same to their factory in Alexandria, Va.

The Hamilton, Ont., board of works have decided to name one of the new streets in the annexed section of the city, Myler Street, as a compliment to P. J. Myler, general manager of the Canadian Westinghouse Co.

The Cornwall Paper Mfg. Co., Cornwall, Ont., have elected the following directors: President, M. P. Davis, Ottawa; vice-president and managing director, S. Greenwood; directors, Col. R. R. McLennan, R. J. Pitts and others. The company's new mill which has a capacity of 15 tons per day has commenced operations.

The Minister of Agriculture, Ottawa, has been advised by Hon. T. Nosse, Japanese Consul-General at Ottawa, that His Majesty the Emperor of Japan has been pleased to confer upon William Hutchison and W. A. Burns, in connection with the fifth National Industrial Exhibition held at Osaka in 1903, the Order of the Rising Sun. Mr. Hutchison and Mr. Burns are now at St. Louis, representing the Dominion Government.

The convention of the National Trades & Labor Congress of Canada will open in Ottawa on September 27, and continue during the three following days. Among the measures of interest which will be discussed are the following: The law affecting the importation of aliens, the regulation and control of immigration, in view of the enormous influx of Italian labor during the present year; the legalization of our Canadian union label; general ways and

IRON FOUNDRY

Attention!

I have a household necessity, which is a very quick seller, that can be made by an iron foundry for \$2.00 and sells for \$10.00, which I wish to have manufactured in Canada on a mutually beneficial arrangement. I will send sample for full test to those interested.

Address:

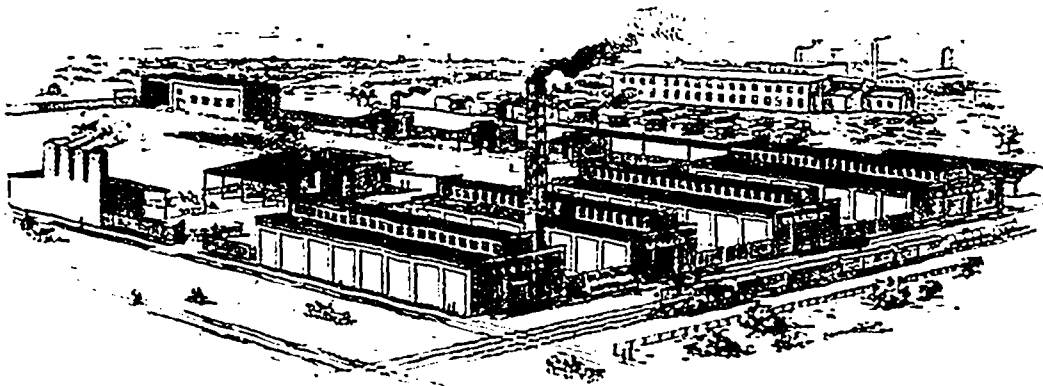
Box 607, - - WINDSOR, ONT.

means of defence; acceptance of design for Canadian national flag.

The retail hardware dealers of Manitoba, at their recent meeting at Winnipeg, organized the Western Manitoba Retail Hardware and Stove Dealers' Association. The officers chosen are: President, J. A. Lindsay, Winnipeg; first vice-president, J. W. Smith, Regina; second vice-president, Robert Wyatt, Winni-

\$50.00 TO CALIFORNIA AND RETURN

via the Chicago, Union Pacific and North Western line, from Chicago, August 15 to September 10. Choice of routes going and returning. Correspondingly low rates from all points in Canada. Two trains a day from Chicago through without change. Daily and personally conducted tourist car excursions. Write for itinerary and full particulars regarding special train leaving Chicago August 18 and 25. B. H. Bennett, 2 East King Street, Toronto.



It is nearly Half a Century

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.

Our experience belongs to those who use and sell Berry Brothers' Varnishes. Safest goods to handle, surest and most reliable goods to use.

WRITE FOR CATALOGUE.

BERRY BROTHERS, Limited, - Walkerville, Ont.



LINDSAY

"THE
CANAL CITY"

WANTS MANUFACTURERS.

THIS COMPANY OFFERS

Cheap Electric Power

Other inducements offered by Municipal Corporation.

Canadian Pacific Railway now taps Lindsay, a growing manufacturing centre, which is also tapped by several branches of the Grand Trunk Railway.

Lindsay's population is about 8,000; is located East-North-East 70 miles from Toronto; is in the centre of a large farming district, and was the **first town** to benefit from the construction of the **Trent Valley Canal**, which, when fully completed, will place Lindsay on the world's greatest grain and ore highway.

WE ALSO OFFER POWER AT PETERBORO'

THE **CENTRAL ONTARIO POWER CO., LIMITED**

J. A. CULVERWELL, Managing Director.

Branch Office—9 Toronto St., TORONTO.

Head Office—Cor. George & Hunter Sts., PETERBORO'.

MANUFACTURERS ...WANTED...

The Municipal Corporation of the **TOWN OF STAYNER, ONT.**, offers to Manufacturers locating in Stayner,

Free Site, Free Water,

Tax Exemptions, . . .

Cheap Power (Electric)

STAYNER Is located on the Grand Trunk Ry., 84 miles from Toronto, 9 miles from Collingwood. Is convenient to shipping on the Great Lakes to Canada's Great West.

J. W. BETHUNE, Mayor.

peg; treasurer, C. A. Baskerville, Winnipeg; secretary, W. W. Lindsay, Winnipeg.

Dr. Eugene Haanel, Director of Mines, and Prof. Barlow of the Geological Survey Department, Ottawa, have gone to Portland, Oregon, to attend the annual meeting of the American Mining Congress.

The United Typewriter Co., Toronto, of which Mr. J. J. Seitz is general manager, have just closed a very successful season, the business of the year amounting to \$200,000. At the annual meeting on July 27, a dividend of 7% was declared and a large sum placed to rest account. The company occupy their own building at 7 & 9 Adelaide Street, East, their factory being located at Georgetown, Ont.

The Minister of Railways, Hon. Mr. Emmerson, has appointed Mr. E. J. Walsh, C.E., to be engineer in charge of surveys in connection with the Trent Valley Canal. One of these will be along the Port Hope route to Lake Ontario, and the other will be for the purpose of determining the best channel between Lake Simcoe and Georgian Bay. Mr. Walsh, who will have two parties under him, will enter upon his duties at once.

The Transcontinental Railway Construction Commission is now complete, and is composed as follows: - Mr. F. B. Wade, K.C., Annapolis, N.S., chairman; Mr. Alfred Brunet, Montreal; Mr. Robert Reid, London, Ont.; Mr. C. A. Young, Winnipeg, Man. It is reported that Mr. P. E. Ryan, secretary to the Temiskaming Railway Commission, has been appointed to act in a similar capacity to the present commission. Mr. H. D. Lumsden, Toronto, is the chief engineer, and Premier Parent the Government representative on the Grand Trunk Pacific directorate. One of the conditions of their appointment is that the commissioners and the engineer shall reside

in Ottawa. The chairman of the commission, Mr. Wade, will receive \$8,000 per annum. Each of the other commissioners \$7,000. The stipend of the chief engineer will be \$6,000. Quarters for the commission will be provided in the Railway Department.

At the annual convention of the Canadian Association of Engineers held this week at Hamilton, Ont., the name was changed to the Canadian Association of Steam Engineers. The Association will petition the Provincial Legislature to require every man in charge of a steam engine of over 25 h.p. to have an engineer's certificate. The following officers were elected for the ensuing year: F. J. Sculthorpe, Hamilton, president; W. A. Sweet, Hamilton, vice-president; W. Ingles, Toronto, secretary; J. M. Dixon, Toronto, treasurer; W. L. Outhwaite, Toronto, conductor; E. Grandboyes, Chatham, Ont., doorkeeper.

THE TORONTO BRANCH.

The usual annual meeting of the Toronto Branch of the Canadian Manufacturers' Association was held August 11, inst., the selection of chairman and officials for the ensuing year resulting as follows:

Chairman, Richard A. Donald; vice-chairman, W. B. Tindall; executive committee, Hedley Bond, P. H. Burton, C. N. Candee, J. W. Cowan, Robt. Crean, P. W. Ellis, John Firstbrook, Ed. Freyseng, Geo. C. Gale, Cromwell Gurney, S. R. Hart, C. B. Lowndes, J. S. McKinnon, John Northway, A. S. Rogers, W. K. George, J. O. Thorn, W. P. Gundy, J. P. Murray.

Representatives on the Industrial Exhibition Association Board: Geo. Booth, W. K. George, W. P. Gundy, Geo. Heintzman, W. K. McNaught, J. P. Murray, H. G. Nicholls, W.

B. Rogers, T. A. Russell, J. T. Sheridan, W. A. Stowger, J. O. Thorn.

Representatives on Executive Council of Association: P. H. Burton, C. N. Candee, R. J. Christie, J. W. Cowan, Richard A. Donald, L. V. Dusseau, W. P. Gundy, Geo. Heintzman, D. T. McIntosh, J. S. McKinnon, P. McMichael, J. P. Murray, Frederic Nicholls, F. B. Polson, Thos. Roden, A. S. Rogers, W. B. Rogers, A. E. Rutter, J. T. Sheridan, T. A. Staunton, Wm. Stone, A. W. Thomas, J. O. Thorn, W. B. Tindall, Henry Wright, S. M. Wickett.

THE GRAND TRUNK PACIFIC ORGANIZATION.

The Grand Trunk Pacific Railway Co. was organized in Montreal, August 10. C. M. Hays, general manager of the Grand Trunk Railway was elected president, and Frank W. Morse, third vice-president of the Grand Trunk Railway, first vice-president and general manager. The other officers are: William Wainwright, second vice-president; Henry Phillips, secretary; Frank Scott, treasurer, and H. W. Walker, general auditor. These are also officials of the Grand Trunk Railway, Mr. Wainwright being comptroller, Mr. Phillips, secretary to Mr. Hays, Mr. Scott, treasurer, and Mr. Walker, general auditor. The executive committee include Messrs. C. M. Hays, Hon. George A. Cox, F. W. Morse, and W. Wainwright. Following are the directors: C. M. Hays, F. W. Morse, W. Wainwright, W. Y. Biggar, Hugh A. Allan, and E. B. Green-shields, of Montreal; Sir Charles Rivers-Wilson, Lord Welby, Col. Fred Firebrace, Alfred W. Smithers, and John Alan Clutton-Brock, of London, England; Hon. George A. Cox and E. R. Wood, of Toronto; John R. Booth, of Ottawa, and John Bell, Belleville, Ont..

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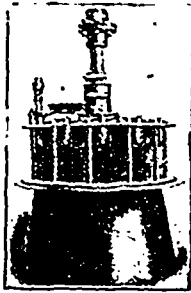
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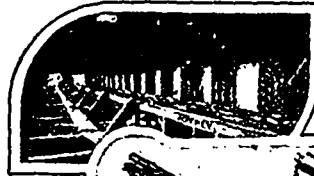
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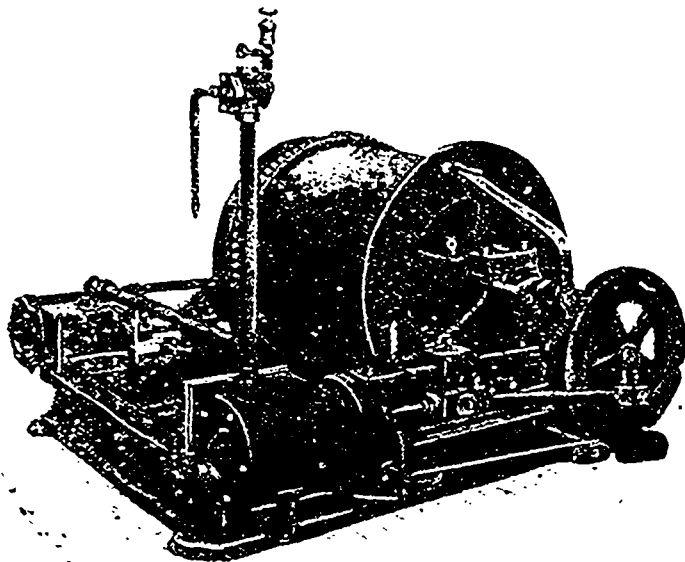
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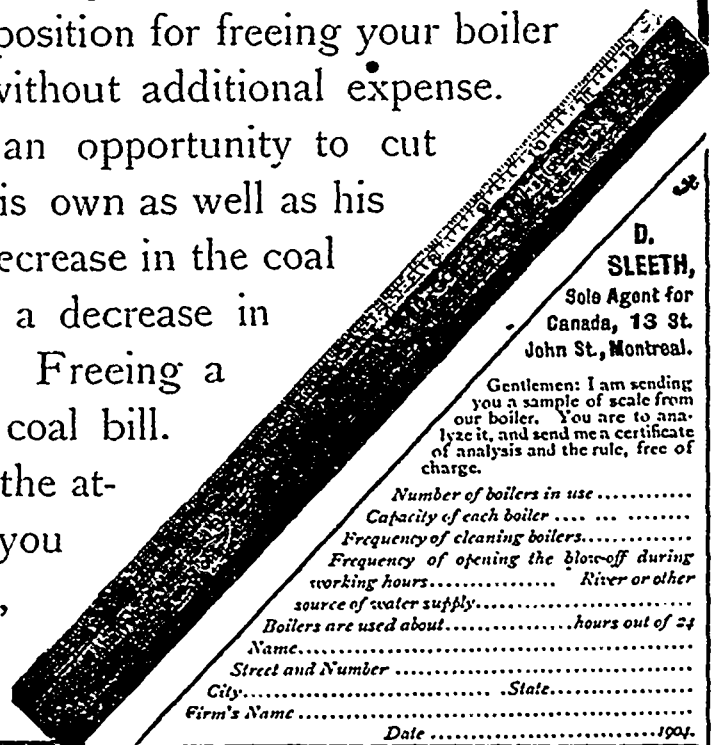
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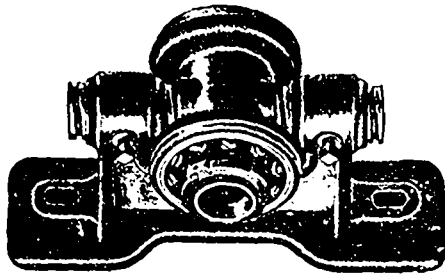


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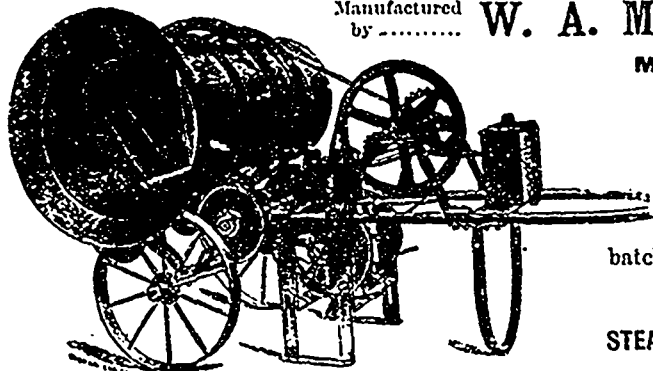
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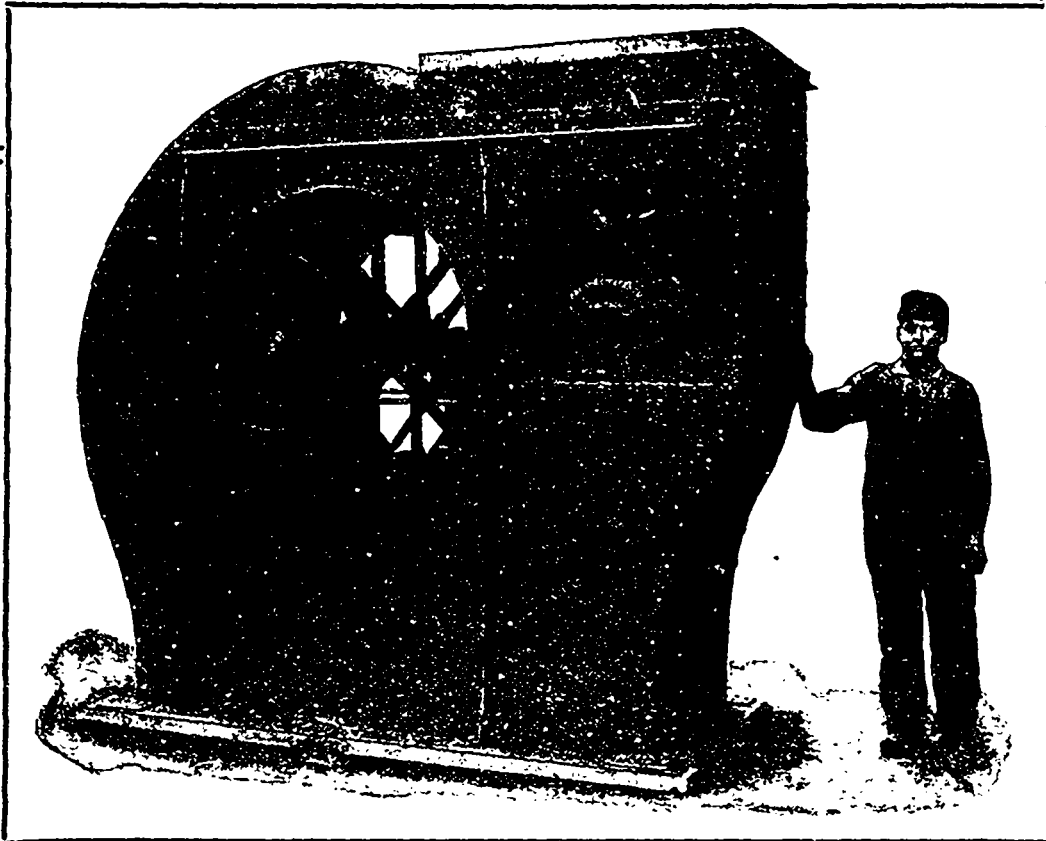
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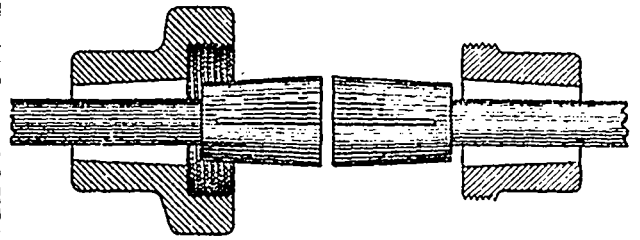
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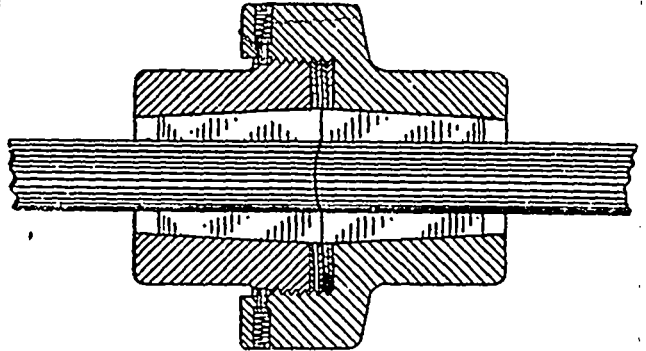
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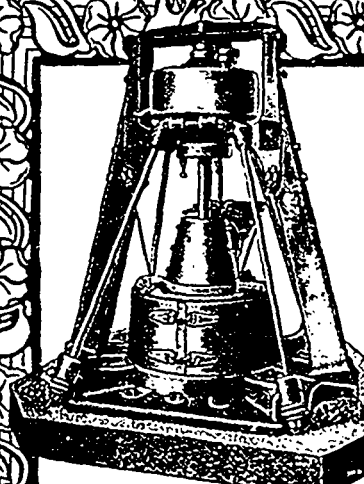


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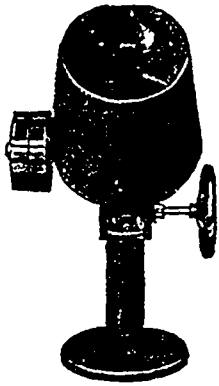
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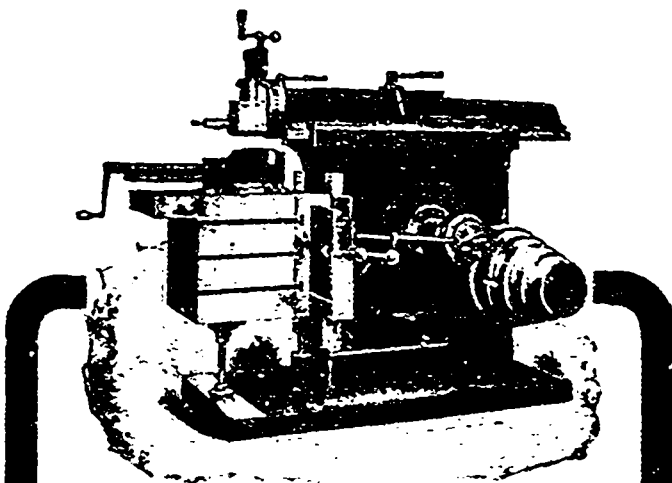
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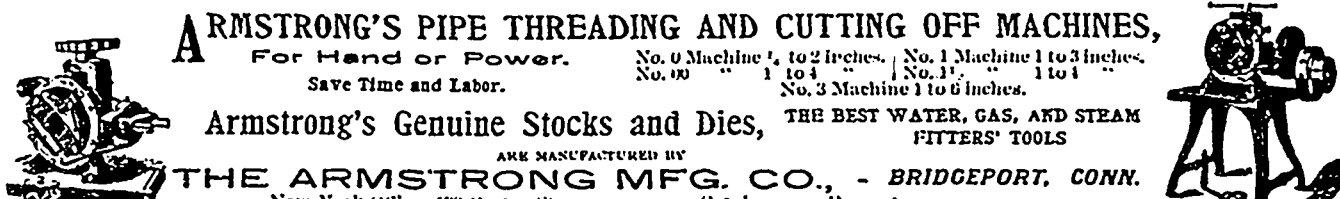
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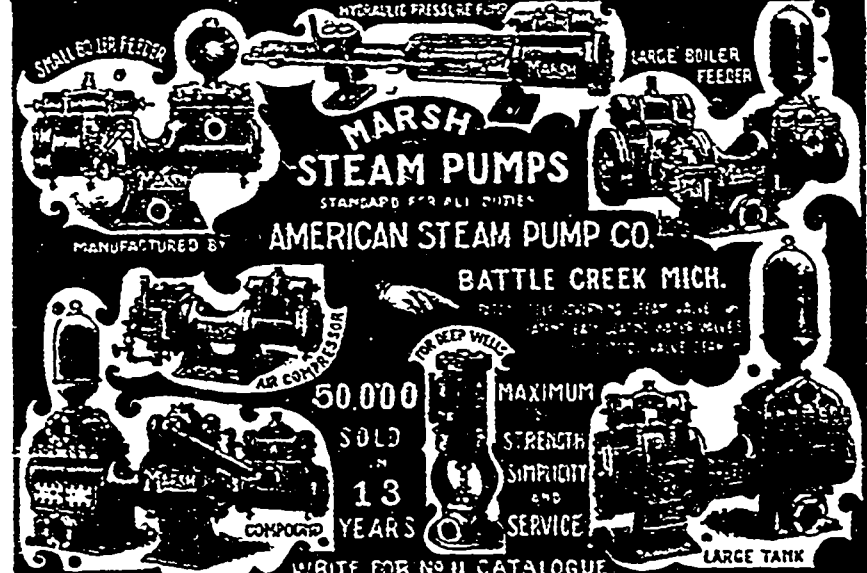
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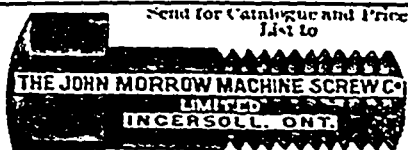
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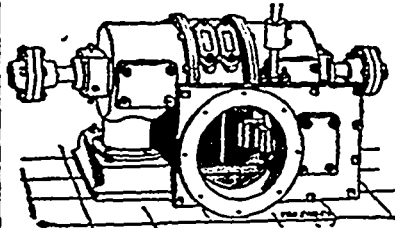
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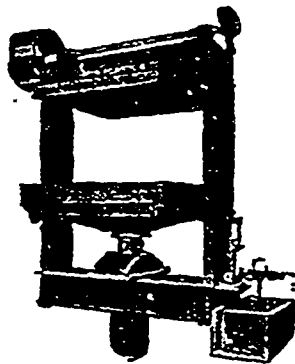
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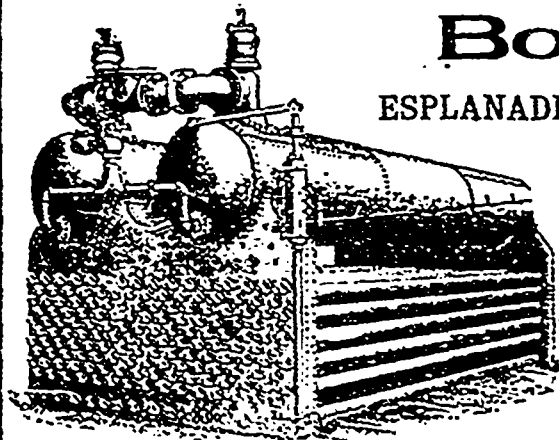
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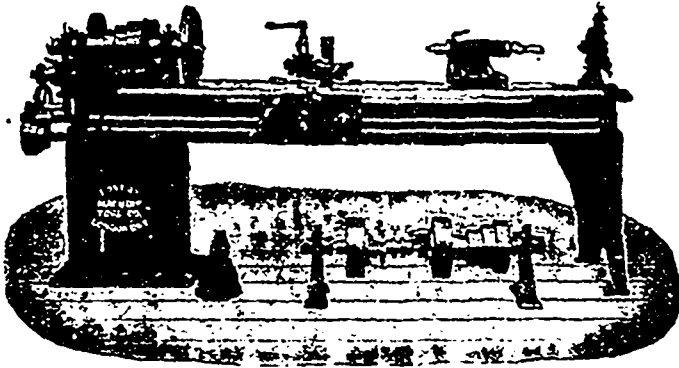
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The Toronto Electric Light Co., Limited; The T. Eaton Co., Limited; The Massey-Harris Co., Limited; The Gutta Percha Rubber & Mfg. Co.; The Wilson Publishing Co., Limited; Sunlight Soap Co.; Dominion Radiator Co.; Central Prison, Forest's Temple, Toronto City Hall, Canada Circuit Co.; Confederation L. Co. (all of Toronto, where Boilers may be seen working), also Orillia Asylum, Orillia, Ont., and LaPresse Publishing Co., Montreal.

The London Machine Tool Co., LONDON, ONT.



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Chamber of Commerce Building,
CHICAGO.

CLASSIFIED INDEX.

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

Air Compressors

American Steam Pump Co., Battle Creek, Mich.
Carr & Foundry Co., Toronto.
Canadian Rand Drill Co., Sherbrooke, Que.
Corbet, H. 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.
Klipstein, A. & Co., New York City.
McArthur, Cornellie & Co., Montreal.
Winn & Holland, Montreal.

**Annaling Muffles and Furnaces
(Wire)**

Morgan Construction Co., Worcester, Mass.
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.

Assayers

Wentz, R. F. Engineering Co., Toronto.

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.

Belt Dressing

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

Belting (Cotton)

Dominion Belting Co., Hamilton, Ont.
Fleming, W. A. & Co., Montreal.
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, F. H., Toronto, Ont.

Belting (Leather)

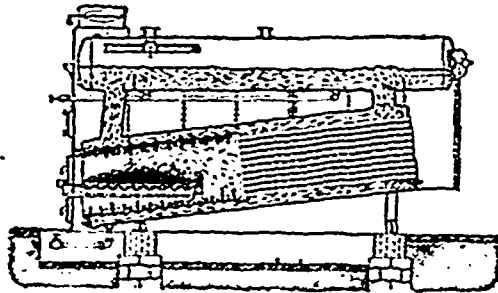
Canadian Oak Belting Co., Brockville, Ont.
Fleming, W. A. & Co., Montreal.
McLaren, D. K., Montreal and Toronto.
McLaren, J. C. Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.
Rice Lewis & Son, Toronto.
Wilby, F. H., Toronto, Ont.
Williams, A. R. Machinery Co., Toronto.

Belting (Rubber)

Gutta Percha & Rubber Mfg. Co., Toronto.
McLaren, D. K., Montreal and Toronto.
Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.

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AGENTS { WILLIAM MCKAY, 320 Ossington Ave., Toronto.
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Boiling and Supplies

Bristol Co., Waterbury, Conn.
 Canadian Oak Belting Co., Brockville, Ont.
 Dominion Belting Co., Hamilton, Ont.
 Fleming, W. A. & Co., Montreal.
 Gatta 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.

Blot Heating Furnaces

Morgan Construction Co., Worcester, Mass.

Blowers

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.
 Seeth, D., Montreal.

Boiler Inspection

Canadian Casualty & Boiler Insurance Co., Toronto.

BOILERS (See Engines and Boilers)

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.
 Pemberthy Injector Co., Windsor, Ont.

Building Iron and Steel

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

Builders' 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.
 Gartshore, John J., Toronto.
 Hopkins, F. H. & Co., Montreal.
 Meadows, Geo. B. Wire, Iron & Brass Works, Toronto.
 Metallic 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.

Card Clothing

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

Cast Iron Pipe

Canada Foundry Co., Toronto.
 Gartshore-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)

Buhl Malleable Co., Detroit, Mich.
 Kerr Engine Co., Walkerville, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Cement Machinery

McDougall, John, Caledonian Iron Works Co., Montreal.
 Wentz, R. F. Engineering Co., Toronto.

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.
 Hey, Thomas & Son, Toronto.
 Wentz, R. F. Engineering Co., 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., Pittsburg, 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

Canadian Rand Drill Co., Sherbrooke, Que.
 Jeffrey Mfg. Co., Columbus, Ohio.

Coal Tippers

Jeffrey Mfg. Co., Columbus, Ohio

Coil Chains

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

Coke Oven Brick

Dunbar Fire Brick Co., Pittsburg, Pa.

Collection Agency

Petrie, H. D., Hamilton, Ont.

Concrete Construction

Stevens, A. J., Toronto.

Concrete Mixers

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

Continuous Rolling Mills

Morgan Construction Co., Worcester, Mass.

Contractors' Machinery

Carlin's, Thomas Sons Co., Allegheny, Pa.
 Gartshore, John J., Toronto.
 Hopkins, F. H. & Co., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Sinclair, G. S. & Sons, Wiarion, Ont.

Contractor's Plants

Hopkins, F. H. & Co., Montreal.
 Petrie, H. W., Toronto.
 Von der Osten, E. & Co., Toronto.
 Williams, A. R. Machinery Co., Toronto.

Conveying Machinery

Babcock & Wilcox, Limited, Montreal.
 Buhl Malleable Co., Detroit, Mich.
 Canada Foundry Co., Toronto.
 Dodge Mfg. Co., Toronto.
 Jeffrey Mfg. Co., Columbus, Ohio.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Perrin, William R. & Co., Limited, Toronto.
 Pittsburgh Shafting Co., Detroit, Mich.
 Rosendale Belting Co., Toronto.
 Stevens, Alfred J., Toronto.

Copper Materials

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

Corundum.

Canada Corundum Co., Toronto.

Corundum Wheels

Canadian Corundum Wheel Co., Hamilton, Ont.
 Rice Lewis & Son, Toronto.

Covers.

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

Crayons

Lowell Crayon Co., Lowell, Mass.

Crucibles

Dixon, Joseph, Crucible Co., Jersey City, N.Y.
 McCullough-Dalzell Crucible Co., Pittsburg, Pa.
 Pittsburg Crucible Works, Pittsburg, Pa.
 Syracuse Smelting Works, Montreal.

Crucible Caps and Nozzles

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

Crucible Covers and Stoppers

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

Dies (Socket, Sewer Pipe and Tite)

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

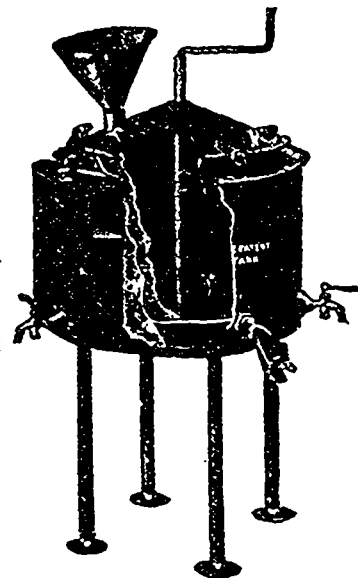
Directories

Kelly's Directories, Limited, Toronto.

Draw Benches (Wire)

Morgan Construction Co., Worcester, Mass.
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

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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)

Canadian Rand 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.
 Stevens, Alfred J., Toronto.
 Sturtevant, B. F. Co., Boston, Mass.

Dust and Shavings Separators

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

Dye Stuffs and Chemicals

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

DYNAMOS (See Motors and Dynamos)**Electric Motors and Transformers**

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

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

Buhl Malleable Co., Detroit, Mich.
 Canadian Otis Elevator Co., Toronto.
 Darling Bros., Montreal.
 Jeffrey Mfg. Co., Columbus, Ohio.

Elevator Insurance

Canadian Casualty & Boiler Insurance Co., Toronto.

Emery and Emory Wheels

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

Engineers (Cement)

Wentz, R. F. Engineering Co., Toronto.

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.
 Morgan Construction Co., Worcester, Mass.
 Parke, R. J., Toronto.
 Perrin, William R. & Co., Limited, Toronto.
 Simpson, T. T., Deschenes, Que.
 Vogel, C. H., Ottawa.
 Volta Electric Repair Works, Toronto.
 Von der Osten, E. & Co., Toronto.
 Wentz, R. F. Engineering Co., Toronto.

Engineers (Contracting)

Babeock & Wilcox, Limited, Montreal.
 Caunda Foundry Co., Toronto.
 Darling Bros., Montreal.
 Electrical Construction Co., London, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Engineers (Electrical)

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)

Babeock & Wilcox, Limited, Montreal.
 Buhl Malleable Co., Detroit, Mich.
 Darling Bros., Montreal.
 Delano-Osborn Engineering Co., Toronto.
 Electrical Construction Co., London, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Hunt, Robert W. & Co., Chicago, Ill.
 Kelsch, R. S., Montreal.
 Kerr Engine Co., Warkerville, Ont.
 Marion & Marion, Montreal.
 Morgan Construction Co., Worcester, Mass.
 Robb Engineering Co., Amherst, N.S.
 Sheldon & Sheldon, Galt, Ont.
 Wentz, R. F. Engineering Co., Toronto.

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

Babeock & Wilcox, Limited, Montreal.
 Bertram Engine Works Co., Toronto.
 Canada Foundry Co., Toronto.
 Canadian Heino 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.
 Leonard, E. & Sons, London, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 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.
 Stayner, Ont., Town of

Feed Water Heaters

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

Fils

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

Financial

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

Filters (Oil)

Babeock & 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)

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

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Fire Brick and Clay

Dunbar Fire Brick Co., Pittsburgh, Pa.
Hamilton Facing Mill Co., Hamilton, Ont.
Pennsylvania Fire Brick Co., Lock Haven.
Pittsburgh & Buffalo Co., Buffalo, N.Y.
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.

Forges and Blowers

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

Foundries

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

Babeock & 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)
Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Gas and Gasoline Engines

Goldie & McCullough Co., Galt, Ont.
Morrison, T. A. & Co., Montreal.

Gas Producers

Morgan Construction Co., Worcester, Mass.

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)

Babeock & Wilcox, Limited, Montreal.
Penberthy Injector Co., Windsor, Ont.

Generators

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.

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.

Grinding Pans

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

Hand Traveling Cranes

Morgan Construction Co., Worcester, Mass.

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.

Hoisting and Ventilating Apparatus

Darling Bros., Montreal.
Leonard, E. & Sons, London, Ont.
Sheldon & Sheldon, Galt, Ont.
Stevens, Alfred J., Toronto.
Sturtevant, B. F. Co., Boston Mass.

Hoisting Engines

Bertram Engine Works Co., Toronto.

Hoists (Chain and Pneumatic)

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

Morgan Construction Co., Worcester, Mass.
McDougall, John, Caledonian Iron Works Co., Montreal.

Hydraulic Cranes

Morgan Construction Co., Worcester, Mass.

Hydraulic Machinery

Canada Foundry Co., Toronto.
Darling Bros., Montreal.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Morgan Construction Co., Worcester, Mass.
McDougall, John, Caledonian Iron Works Co., Montreal.
Petrie, 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.
Huhl 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

Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Forman, John, Montreal.
Packard Electric Co., St. Catharines, Ont.

Lathos

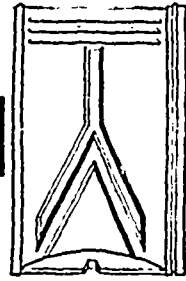
Cowdrey, C. H. Machine Works, Fitchburg, Mass.
London Machine Tool Co., London, Ont.
Petrie, H. W., Toronto.
Williams, A. R. & Co., Toronto.

Lathos (Wood-Working)

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

Lubricators

Penberthy Injector Co., Windsor, Ont.



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CLASSIFIED INDEX.

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Machinists

Bertram Engine Works Co., Toronto.
Buhl Malleable Co., Detroit, Mich.
Goldie & McCullough Co., Galt, Ont.
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.
Ryall Machine Screw Co., Montreal.
Sinclair, G. S. & Sons, Wiarion, Ont.
Worth & Martin, Toronto.

Machino 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.

Machinery Repairs

Bertram Engine Works Co., 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

Bertram Engine Works Co., Toronto.

Mechanical Draft

Babcock & Wilcox, Limited, Montreal.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Metal Shears

Morgan Construction Co., Worcester, Mass.

Metal Stamping

Empire Machine & Metal Stamping Co., Toronto.
Globe Machine & Stamping Co., Cleveland, Ohio.

Metallurgists

Mills, S. D., Toronto.
Wentz, R. F. Engineering Co., Toronto.

Mill Machinery and Supplies

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.
Greer, Wm. & J. C., 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.
Leonard, E. & Sons, London, Ont.
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.
Ryall Machine Screw Co., Montreal.
Sinclair, G. S. & Sons, Wiarion, Ont.
Snence, R. & Co., Hamilton, Ont.
Wilson, J. C. & Co., Glenora, Ont.

Miners' Lamps

Anton, John & Son, Monongahela, Pa.

Mining Machinery

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, Whillia R. & Co., Limited, Toronto.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Motors and Dynamos

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.
Patent Exchange & Investment Co., Toronto.

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)

Babcock & 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.

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Plumbago

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

Pneumatic Tools

Canadian Rand Drill Co., Sherbrooke, Que.

Painter Rolls (For Rods and Wire)

Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Portland Cement

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

Power Plants—Equipments

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.
Delno-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.
Kolsch, H. S., Montreal.
Leonard, E. & Sons, London, Ont.
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.
Stevens, Alfred J., Toronto.
Sturtevant, B. F. Co., Boston, Mass.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Wilson, J. C. & Co., Glenora, Ont.

Presses (Tile, Sower 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

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.
Gartshore, 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.

Reamers

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

Rivets

Bourne-Fuller Co., Cleveland, Ohio

Roll Lathes

Morgan Construction Co., Worcester, Mass.

Roller Bearings

Pittsburgh Shafting Co., Detroit, Mich.

Rolling Mills

Morgan Construction Co., Worcester, Mass.

Rolling Mill Engineers

Bourne-Fuller Co., Cleveland, Ohio.
Morgan Construction Co., Worcester, Mass.

Roofing

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

Rubber Goods

Gutta Percha & Rubber Mfg. Co., Toronto.
Pittsburgh 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

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.

Sheets (Iron and Steel)

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.
Stanyon Metallic Furniture Co., Toronto.

Sheet Metal Stamping

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

Ship Builders

Bertram Engine Works Co., Toronto.
Clyde Steel Works, 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.

Special Machinery

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

Speed Recorders

Bristol Co., Waterbury, Conn.

Springs—Flat and Spiral

Bailey-Underwood Co., New Glasgow, N. S.

Sprinkler Insurance

Canadian Casualty & Boiler Insurance Co., Toronto.

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CLASSIFIED INDEX.

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Stamps & Stencils

Globe Machine & Stamping Co., Cleveland, Ohio.
Hamilton Stamp & Stencil Works, Hamilton, Ont.
Stanyon Metallic Furniture Co., Toronto.

Steam Pumps

American Steam Pump Co., Battle Creek, Mich.
Canada Foundry Co., Toronto.
Darling Bros., Montreal.
Goldie & McCullough Co., Galt, Ont.
Leonard, E. & Sons, London, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
Petrie, H. W., Toronto.
Pittsburg Shafting Co., Detroit, Mich.
Williams, A. R. Machinery Co., Toronto.

Steam Separators

Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.

Steam Specialties

Darling Bros., Montreal.
Penberthy Injector Co., Windsor, Ont.
Sheldon & Sheldon, Galt, Ont.

Steam Valves

American Steam Pump Co., Battle Creek, Mich.
Babcock & Wilcox, Limited, Montreal.
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 Plants

Morgan Construction Co., Worcester, Mass.

Steel Rails

Algoma Steel Co., Sault Ste. Marie, Ont.
Drummond, McCall & Co., Montreal and Toronto.
Gartshore, John J., Toronto.
Hopkins, F. H. & Co., Montreal.

Steel Shafting

Darling Bros., Montreal.
Goldie & McCullough Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Leslie, A. C. & Co., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Pittsburg Shafting Co., Detroit, Mich.
Wilson, J. C. & Co., Glenora, Ont.

Stocks and Dies

Arm-trong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que.
Petrie, H. W., Toronto.
Rice Lewis & Son, Toronto.
Worth & Martin, Toronto.

Stoppers

McCullough-Dalsell 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

Canadian Colored Cotton Mills Co., Montreal.
Dominion Oil Cloth Co., Montreal.
Hamilton Cotton Co., Hamilton, Ont.
Morrice, D. Sons & Co., Montreal.
Smith Mfg. Co., Toronto.
Storey, W. H. & Sons, Acton, Ont.

Textile Supplies

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.
Hopkins, F. H. & Co., Montreal.
Morgan Construction Co., Worcester, Mass.
McDougall, John, Caledonian Iron Works Co., Montreal.
Sheldon & Sheldon, Galt, Ont.

Trucks (Railway)

Canada Foundry Co., Toronto.

Trucks (Wire Mill Supplies)

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

Tubs (Cleaning and Coating Wire)

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

Tugs

Bertram Engine Works Co., Toronto.

Tumbling Barrels

Globe Machine & Stamping Co., Cleveland, Ohio.

Turbines

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Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Wilson, J. C. & Co., Glenora, Ont.

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Valves

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

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Berry Bros., Walkerville, Ont.

Ventilators

Darling Bros., Montreal.
Sheldon & Sheldon, Galt, Ont.
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Hore, F. W. & Son, Hamilton, Ont.

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Water Purifying Chemicals

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

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Ontario Wind Engine & Pump Co., Toronto.

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Morgan Construction Co., Worcester, Mass.
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.

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Wire Rod Rails

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Wire Specialties

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Wood-Working Machinery

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Goldie & McCullough Co., Galt, Ont.
London Machine Tool Co., London, Ont.
Petrie, H. W., Toronto.
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Stentop, John Shaper Co., Cincinnati, Ohio.
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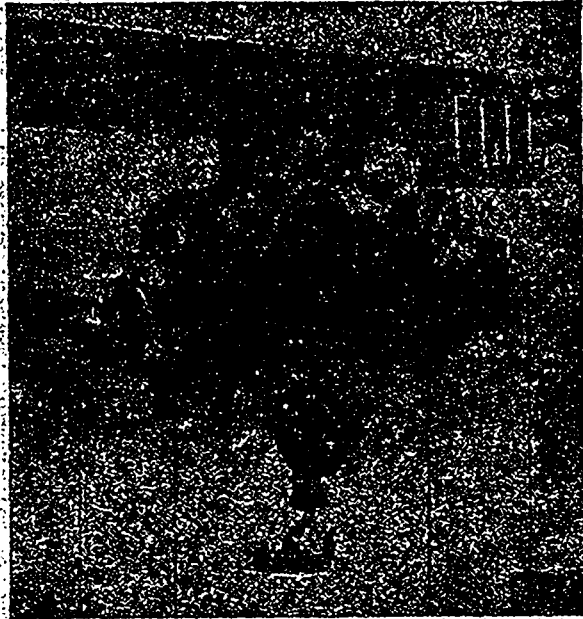
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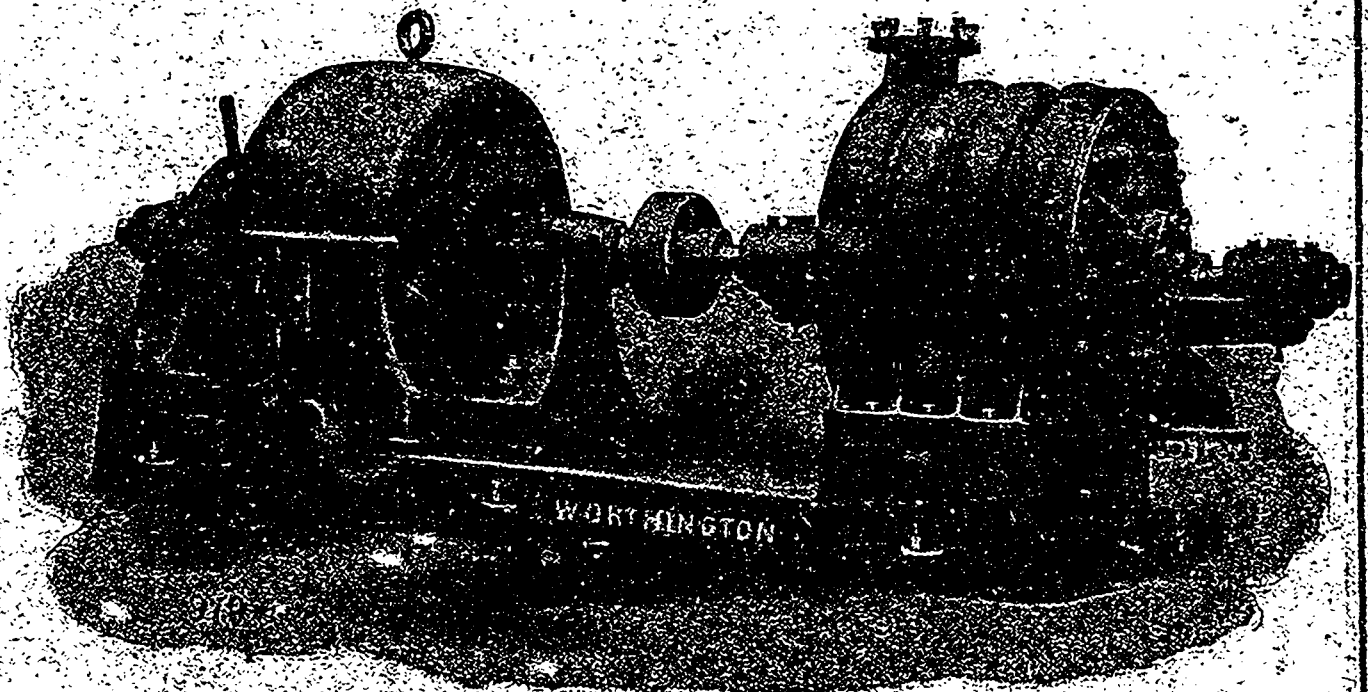
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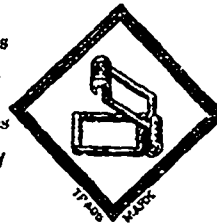
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