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THE CANADIAN MANUFACTURER
 AND INDUSTRIAL WORLD
 DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

Vol. 27.

TORONTO, APRIL 20, 1894.

No. 8.

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CUSTOMS RULINGS AND INSTRUCTIONS.

The Customs Department have issued the following instructions to collectors :-

Under date of April 4:-

In view of the more general application of ad valorem duties under the present Tariff, and the tendency at present in the United States to offer goods for consumption in Canada at prices much below their ordinary fair market value in the United States, collectors are specially instructed to cause all invoices from United States vendors, which may be presented for entry, to be carefully scrutinized, to the end that the collection of duty upon proper

values shall be ensured. In any case where goods are invoiced as being job lots, or in which from the information at command collectors are doubtful as to values, they will forward the invoice and any information in their possession, direct, to the Department, in order that collectors may be supplied with the necessary instruction and information as to their course of action.

Re goods exported. Under date of April 9 :-

The Customs Department is informed that goods shipped in bond for foreign countries, and passing, while en route to such countries, through the United States, are frequently included in the export returns as being shipments to the United States direct. Collectors are instructed to use every effort to ascertain correctly the country of destination of all goods entered for export, to the end that the export statistics of the Department shall be as correct as possible as to such foreign destination.

OUR PIG IRON INDUSTRY.

During the calendar year 1893 the production of coke pig iron in Canada by the following named companies was as follows :

	TONS.
Londonderry Iron Co., Londonderry, N. S.	23,474
New Glasgow Iron, Coal & Ry. Co., Ferrona, N.S.	22,500
Total,	45,974

The value at furnace of this iron was \$545,366. Total ore charged, 191,246 tons. Quantity of fluxing material, 26,399 tons. Quantity of fuel charged, 65,330 tons. Number of persons employed, 880.

The statistics of charcoal iron were as follows :

	TONS.
Canada Iron Furnace Co., Radnor Forges, Que.	7,422
Pictou Charcoal Iron Co., Bridgeville, N. S.	498
Total	7,920

Value at furnace (of 7,422 tons), \$185,575. Total ore charged, 17,553 tons. Quantity of fluxing material, 1,804 tons. Quantity of fuel charged, 818,220 bushels. Number of persons employed, 700. The Bridgeville furnace was in blast but a few months during the year.

The total quantity of iron made was 53,894 tons, the result of the labor of 1,580 persons, the average value per ton at furnace, where values are given, \$13.87 6/10, the average output per man being slightly in excess of 34 tons of the value of \$471.78, the average output per man of coke iron was 52.1 tons valued at \$617.90, or \$11.86 per ton.

Pig iron imported into Canada for home consumption during the fiscal year ending June 30, 1893, was as follows :

	QUANTITY.	VALUE.
Iron in pigs, n.e.s., tons	56,703	\$680,660
“ charcoal, “	5,944	84,358
All other cast iron, “	146	1,549
Total “	62,793	\$766,567

The average import value of this iron was : For iron n.e.s., \$12 per ton ; for charcoal iron, \$14.19 per ton ; for all, \$12.20 per ton.

Average value per ton of home made coke iron . . . \$11.86
“ “ “ imported “ “ . . . 12.00

Average value per ton of home made charcoal iron.	25.00
“ “ “ imported “ “	14.19
“ “ “ all home made iron.....	13.87
“ “ “ all imported iron.....	12.20

The relative proportions of quantities of these domestic and imported coke and charcoal irons were as follows :

Domestic coke.....	83	per cent.
“ charcoal.....	17	“
Imported coke.....	89.5	“
“ charcoal.....	10.5	“

Our consumption of pig iron was as follows :

Domestic coke,	tons,	45,974
Imported “	“	56,703
Domestic charcoal	“	7,920
Imported “	“	5,944

Total “ 116,541

It will be observed that we supply over 44 per cent. of our requirements for coke iron ; and 57 per cent. for charcoal iron.

Our imports of pig iron in the following named years, and its value, were as under :

	TONS.	GROSS VALUE.	AVERAGE VALUE PER TON.
1890	87,613	\$1,148,078	\$13.10
1891	81,317	1,085,929	13.35
1892	68,918	886,485	12.86
1893	62,793	766,567	12.20

By this it will be seen that since 1890 our imports of pig iron have decreased more than 25 per cent., which quantity has evidently been made more than good by our increased home production, the plain inference being that our pig iron industry, if properly protected, will soon be in a condition to supply all our necessities.

REGARDING STATIONARY ENGINEERS AND STEAM BOILERS.

The constitution of the Ontario Association of Stationary Engineers is embodied in an act of the Ontario Legislature entitled An Act Respecting Stationary Engineers, passed April 30, 1891. The incorporators of this Association organized under this Act were: Prof. J. Galbraith, of Toronto University, John Galt, M. E., A. E. Edkins, William Sutton, A. M. Wickens and J. A. Wills, all of Toronto; Hugh Fairgrieve, Robert Dickinson, Robert Mackie and Sylvester Potter, all of Hamilton; Arthur Ames, of Brantford, and James Devlin, of Kingston. The Association is a body corporate, having a perpetual succession, and every person registered under the provisions of this Act is a member thereof. No person is eligible for election to the Board of Management unless duly qualified under the provisions of the Act. It is the duty of the Board to make rules for the uniform inspection of steam plants and for the conduct of examinations; but no power was conferred admitting of compulsory inspection. Under the Act authority was given to issue certificates, and such certificates must, in plain terms, name the particular steam plant the holder is qualified to operate. No certificate or renewal thereof may be granted by the Association to any person addicted to the excessive use of intoxicating liquors; and any certificate which may have been granted may at any time be revoked when the holder thereof has been shown to have been guilty of gross carelessness,

incompetence or intemperance. The expression “steam plant” includes boilers and steam engines, and every part thereof or thing connected therewith, and all other apparatus and things connected therewith or used with reference to any such engines or under the care of the engineer. During the life of a certificate the holder thereof may apply for one of higher grade, which will be granted to him on his passing the necessary examination and paying the prescribed fee. The fees for examination are: For First class, \$5, Second class, \$3, Third class, \$2; and for renewals in each class \$1.50, \$1.25, and \$1 respectively. The Board can consist of only such members as hold First class certificates. Certificates are issued for a term of one year only, are the property of the Board, and must be returned to the Registrar within thirty days after the holder has been notified so to do. No certificate shall at any time be issued to any person who excessively uses spirituous liquors. A Third class certificate is evidence that the holder thereof has had two years' experience in the management and care of steam boilers and boiler-feeding devices, and has satisfied the Board as to his character and sobriety. A Second class certificate is evidence that the holder thereof has, in addition to the qualifications for the Third class, one year's experience in charge of steam engines and boilers, and that he understands the management of heating apparatus and the principles of combustion. A First-class certificate is evidence that the holder thereof has, in addition to the qualifications required for a Second class certificate, two years' experience in charge of steam plants, a knowledge of the application of steam, the use of the steam engine indicator, the construction of boilers and of condensing and non-condensing steam engines, and the strength of materials; and he must also understand the principles of heating and ventilation.

The association are asking the Ontario Legislature to amend the law regarding them substantially as follows:— No fees shall be imposed by the Board except upon the inspection of steam plant at the request of the owners thereof, and upon the granting of certificates and renewals thereof to members of the Association, and upon examinations of candidates for such certificates. Every member of the Board hereafter elected shall, before entering upon the duties of his office, enter into a penal bond of \$1,000 conditioned for the due performance of his duties. Every person not being registered and the holder of a certificate under the provisions of the Act who shall, after July 1, 1895, operate any steam plant to which the Act applies, shall be liable to a penalty and costs of conviction. Every person holding a certificate and operating a steam plant shall expose the same in a conspicuous place in the engine or boiler room in which he is employed, in default of which he shall be liable to a penalty and costs. A new section provides that nothing in the Act shall be deemed to apply to or affect the operation of steam engines or boilers upon farms for threshing or other agricultural purposes.

We fail to discover in any of the provisions of the original Act, or in the proposed amendment thereto, anything objectionable. The law is intended to apply in this as in other cases where the lives and property of unsuspecting persons may be endangered. Thus necessary safeguards are thrown around any blasting operations that may

be carried on in populous districts; the manufacture of gunpowder and other explosives is forbidden elsewhere than in remote and secluded places; butchering is prohibited in cities and towns; railway trains are not allowed to run in cities and towns except at reduced speed, etc.; and no steamer, especially those employed in passenger traffic, is allowed to operate without certificated engineers and other officers.

The importance of requiring those having charge of steam plants, especially in towns and cities, to be properly qualified has been emphasized quite frequently of late here in Canada as well as elsewhere. But a few days ago quite a thrilling event happened at a Methodist church at Wallaceburg, Ont., while religious service was progressing. The church was heated by steam, a system of piping connecting with a steam boiler located in an adjoining building. The account states that owing to the high pressure of steam in the boiler—an old one—a piece of it was blown out. No great damage was done in the stampede that was made by the worshipers for the doors, but the result might have been fearful. And that was a terrible affair that occurred at Vale's saw mill, near Dresden, Ont., on March 12, when the boiler exploded, killing Cornell, the engineer, and his three children, who were with him, the boiler being projected over an adjoining house. Such accidents—they should not be called accidents—are sometimes attributed to some mysterious acts or permissions of the Almighty, but common sense, practical people know that they are the result of stupidity or ignorance, or both. At the best a power capable of hurling a boiler over a house, and of making a complete wreck of a strongly constructed building, should be in the care of a watchful, sober and competent man; but to entrust it to one not possessed of such qualifications is an act of recklessness that should not be allowed.

PATENTS OF INVENTIONS.

A correspondent enquires of us why so much space in this journal is given to recording the list of letters patents for inventions issued by the Dominion Government, and the names and places of residence of the inventors, and our answer is that the patents having been issued, the fact is of sufficient importance to our readers to demand the attention it receives in these pages. It is a gratifying fact that a very large proportion of these patents are issued to Canadian inventors, showing that the spirit of ingenuity and originality is actively at work in our people; and it is also very gratifying to observe that foreign inventors have such a high opinion of Canada, and of our business capabilities as to show to them the importance of obtaining patents for their inventions in this country. If Canadians were not a race of observing and thinking people, quick to utilize valuable original ideas, and to secure to themselves the exclusive benefits of them by having them patented, we would not be the prosperous people we are, and if we were not a prosperous people, foreign inventors would not look upon Canada as a country specially desirable in which to secure any benefits to be derived from their inventions by having them patented here.

Unfortunately, the idea prevails with many that to be an inventor is to be a specially endowed being, oblivious of the

fact that inventions, generally, like all other social improvements, originate in the minds of those in the most common and ordinary walks of life, and with those supposed to have but little of the so-called inventive faculty in them. Invention is not peculiar to any class of the community, or even to human beings, for it is well known that most animals are possessed of what we call instinct, which impels them to devise sometimes most extraordinary ways and means for their own protection and subsistence. Perhaps the first inventor of hydraulic engineering appliances was the Canadian beaver; and books on national history are replete with accounts of inventions of animals truly marvelous. Every man, woman and child of ordinary mental capacity is an inventor, and many of the most valuable inventions known to the world were the result of the ingenuity of only common, every day people, who set about thinking how they could best supply some want. The value of such inventions not only to the inventor but to the world at large is shown in a recent report of the United States Commissioner of Patents, where it is stated that six to seven-eighths of the entire manufacturing capital of that country, of six thousand million dollars, was based upon patents.

In some countries which have long records of splendid achievements in arts, sciences, music, literature, arms and commerce, inventors are, too frequently, looked upon either as men whose patient struggles deserve admiration, or as men of needy condition and more or less disordered minds, upon whom pity should be bestowed, mingled with distrust, because of what are said to be their extravagant claims. But it should be remembered that great men, usually, be they warriors, statesmen or artists; do not reap rich pecuniary rewards. On the other hand inventive genius, which from time to time flashes out upon the world and benefits mankind, is frequently rewarded with fabulous fortunes. And so it is that from men of but ordinary intelligence, and frequently from nothing more than a happy thought, come the most practical, the most useful and the best money-making inventions. It is this latent inventive faculty, possessed in some degree by all men, which, when developed, resulting in a valuable invention, when patented becomes a mine of wealth to the happy inventor. It required the energy of a master mind to devise and execute the method by which cheap postage was given to the world, and in that connection the name of Rowland Hill will live in history, but he died a comparatively poor man; but the poor man whose ingenuity invented a method of perforating postage stamps, although his name may not now even be known, died in the enjoyment of a large fortune.

Our methods of living constantly present to us opportunities for the exercise of our inventive faculties; for there is not a convenience which we deem essential to our enjoyment of life that does not suggest to some one some improvement which will either cheapen the cost or increase the comfort. While colossal fortunes have been accumulated by such great inventors as Edison, Bell and Bessemer, thousands of inventors, in every walk in life, in every class of society, have made fortunes and are in the enjoyment of large incomes from inventions of comparatively trivial importance. Perhaps the first toilet pins ever used by human beings were thorns utilized by Eve for holding fig leaves

together to screen her from the too ardent and amorous glances of Adam; but the woman who invented the safety pin by bending the wire into such a shape as to prevent the point from scratching her babe, although her name be not now remembered, lived in luxury on the proceeds of her patent, and bestowed a real benefit and blessing upon all mothers and their infants.

AS TO STATIONARY ENGINEERS.

In a recent issue of this journal allusion was made to a petition which was then being signed, praying the Ontario Legislature to amend the Act of 1891, entitled, An Act Respecting Stationary Engineers, so as to provide that after January 1, 1895, all persons in charge of steam boilers, engines, etc., constituting a steam plant of 25 horse power, situated in cities, towns and villages having a population of 1000 or over, be required to pass an examination and obtain a certificate of competency and sobriety from a Board of Examiners of the Ontario Association of Stationary Engineers. The petition made an exception so as not to apply to or affect the operation of steam engines or boilers upon any farm used for threshing and agricultural purposes.

In our view the proposed amendment to the law is very desirable; and we regret to observe that our esteemed contemporary *The Galt Reporter* differs with us and declares that the desirability of such a regulation is more than questionable. It tells us that with the advance made in the construction of boilers and machinery of late years, the necessity of skilled stationary engineers has practically passed away; that enquiry will elicit the fact that for one certified engineer thus employed there are fifty who do not possess certificates, and that there is less danger and fewer explosions now than when we had not half the number of steam plants in the country.

Our esteemed expert-in-steam-machinery contemporary instructs us that the simplicity and excellence of manufacture of such machinery is largely the cause of this; and that it must always be borne in mind that though the person in charge may not be a certified engineer, the plant is so largely governed in its working by mechanical appliances, that had he a hundred certificates he would be of no more use than if he had none. We are further favored with the information that the substantial knowledge uncertificated engineers have of the machinery under their charge is quite sufficient for their responsibility.

All this asseveration is of a most unique and picturesque character, and displays a wonderful knowledge of facts strangely at variance from that prevailing among those usually supposed to be intelligent steam engineers. Perhaps our contemporary has obtained his ideas of the importance, or rather unimportance, of skilled engineers in connection with steam plants from his ubiquitous duties as editor, printers' devil and general utility man about the office of a newspaper where steam power is used. We are sure he could not have been led into making such silly assertions from anything any practical, well-informed mechanic or steam user may have told him. In fact, the assertions *The Reporter* makes are ridiculous in the extreme. It is ridiculous to say that the advance made in the construction of boilers and machinery of late years renders the presence of skilled engineers practically unnecessary. In some back-

woods newspaper offices where steam is used, some reckless and ignorant men may day after day jeopardize the lives of those who may venture near their places, but in all well-regulated establishments, where the proprietors have due regard for their own interests, and for the lives of others, such practices do not prevail. One may supply plenty of arguments, fortified by the experience of experts, why only competent engineers should have charge of steam plants; but all the experts in the land cannot supply the intelligence necessary to comprehend the facts. Perhaps there would be no great and irreparable loss to the community if the life of a foolish, reckless man were sacrificed by his temerity in monkeying with a dangerous thing; but it would be exceedingly unfortunate if the life of any innocent person were sacrificed by such temerity. Such a man might be quite willing to take the chances for himself, but he certainly should not be allowed to endanger the lives or property of others.

We deny the assertion, too, that the necessity of skilled engineers has practically passed away, or that where there is one certified engineer employed in our factories and work shops, in charge of steam plants, there are fifty who do not possess certificates. In fact the contrary is the case, the general rule being that only men of acknowledged ability and experience are employed in such positions. If the contention of *The Reporter* is correct, then that is the strongest kind of an argument why the law should be amended. In all towns there are steam plants located quite contiguous to streets where innocent and unsuspecting people are constantly passing. Most of these plants are enclosed from public view, and in many instances steam boilers are placed beneath the very sidewalks over which the street traffic flows in an unceasing tide all day long. We know that boilers do explode, and that human lives and much property are destroyed by such explosions, and it is not in the interests of the public that the impression is sought to be made that unnecessary risks are incurred when such steam plants are intrusted to the care of ignorant and incompetent men. If there are fewer explosions now than when steam plants were not so numerous, it is simply because the laws of the land throw out safeguards at the demand of public sentiment; not because there are no reckless and incompetent men ready to assume charge of them.

The Reporter displays its unacquaintance with facts when it proclaims that the simplicity and excellence of modern steam machinery render the presence of expert engineers unnecessary—that such machinery is so largely governed in its working by mechanical appliances that a substantial knowledge of the mechanism is quite sufficient for the responsibility. If this means anything it means that the student in any technical school who has acquired a knowledge of the theory of the expansion of steam, and the construction of the steam engine, and who knows where to find the throttle valve, is quite competent to take charge of a modern steam plant—that this knowledge is quite sufficient for the responsibility. Some most excellent steam plants are built in Galt, but we do not imagine that any manufacturer there, having supplied such a plant, and requested to recommend a man suitable to take charge of it, would name any one who had no greater qualification than that suggested by *The Reporter*. Can it be imagined that such a man could be placed in charge of such a steam plant

as that in the power house of the Toronto Railway Company; and if not there why should he be placed in any other similar position?

"The exception in favor of farm steam machinery, so far as threshing machinery is concerned," says The Reporter, "makes one doubt the bona fides of the whole petition, for if there is one description of steam plant which falls into the hands of unskilled men more than another it is these engines, with the result that accidents from them more frequently result—ten to one in proportion to numbers in use—than any other of the various plants in use, as statistic would readily prove."

In this matter, too, The Reporter seems to be uninformed. There are quite a number of farmers in the Legislatures no better informed than our contemporary, and who would, therefore, vote against the proposed amendment upon the ground that it would in some way infringe upon their business; but without doubt no objection would be raised by the promoters of the amendment should the farmers desire to be included in the operation of it. A steam engine on a forty-acre farm is not as dangerous as one in the heart of a crowded town.

THE CANADIAN TARIFF.

In our issue of April 6th we gave an entire reproduction of the new Canadian tariff as reported to the Dominion House of Commons by Finance Minister Foster on March 27. Since then, on April 13, Mr. Foster has made other changes and amendments as follows:—

Resolved, that it is expedient to repeal so much of the Inland Revenue act and amending acts as determines the excise duties to be levied upon malt and vinegar and to provide that on and after March 25 excise duties thereon shall be as follows: Malt, one and one-half cent per pound; vinegar, eight cents per proof gallon.

"That the value of all bottles, flasks, jars, demijohns, carboys, casks, hogsheds, pipes, barrels and all other vessels or packages manufactured of tin, iron, lead, zinc, glass or any other material and capable of holding liquids, and all packages in which goods are commonly placed for home consumption, including cases in which bottled spirits, wines or malt liquors or other liquids are contained, and every package being the first receptacle or covering enclosing goods for purpose of sale, shall in all cases not otherwise provided for in which they contain goods subject to an ad valorem duty on a specific and ad valorem duty be taken and held to be a part of the fair market value of such goods for duty and shall be charged with the same rate of ad valorem duty as is to be levied and collected on the goods they contain, and when they contain goods subject to a specific duty only such packages shall be charged with the duty of custom of 20 per cent ad valorem, to be computed upon their original fair market value, and all or any of the above packages described as capable of holding liquids when containing goods exempt from duty under this act shall be charged with a duty of 20 per centum ad valorem, provided the contents thereof are not of such a nature that the destruction of the packages becomes necessary in order to release the goods and all other packages containing free goods, and being in the first receptacles or inner coverings enclosing goods for the purpose of sale shall be dutiable at the same rate as if imported empty, but all packages not herein before specified and not herein specially charged will be declared liable to duty under regulations and being the usual ordinary packages in which goods are packed for exportation according to the general usage and custom of trade shall be free of duty. Provided, further, that all special packages or coverings unlike those in which such goods as they contain are usually packed for some consumption and all such packages and coverings as are apparently designed for use other than that in the importation of the goods they contain, shall be subject to the same rates of duty as they would be if imported empty or separate from their contents.

Resolved, that the following articles shall be free of duty: Brass cups, being rough blanks, for the manufacture of paper shells for cartridges when imported by manufacturers of brass and paper shells and cartridges, for use in their own factories.

Brass, iron or steel rolled round wire rods over half an inch in diameter, and rolled copper rods, one inch or under in diameter, when imported by wire manufacturers for use in making wire in their own factories.

Calcareous tufa, when imported for use in the manufacture of in-durate fibre ware, or sulphite fibre, and for no other purpose.

Crucible sheet steel, eleven to sixteen gauge, 2½ to 18 inches wide, when imported by manufacturers of mower and reaper knives for the manufacture of such knives in their own factories.

Copper rollers for use in calico printing, when imported by calico printers for use in their factories, for the printing of calicoes, and for no other purpose, (such rollers not being manufactured in Canada.)

Elastic rubber thread for the manufacture of elastic webbing, when imported by the manufacturers of elastic rubber webbing, to be used for that purpose only in their own factories.

Felloes of hickorywood, rough sawn to shape only, or rough sawn and bent to shape, not planed smooth, or otherwise manufactured, when imported by manufacturers of carriages and cart wheels, to be used in manufacture of such articles in their own factories only.

Fish skins and fish offal, when imported by manufacturers of glue, for use in their own factories.

Grease rough, the refuse of animal fat, for the manufacture of soaps and oils only.

Gum chicle, or sappato gum, in a crude state.

Hatters' bands (not cards), bindings, tips and sides, hat sweats and linings, both tips and sides, when imported by hat and cap manufacturers, only for use in their manufactories for the manufacture of hats and caps.

Hemp paper, made on four-cylinder machines, and calendered to between six and eight inch thickness for the manufacture of shot shells, primers for the manufacture of shot shells, cartridges, and felt board sized and hydraulic pressed and covered with paper or uncovered, for the manufacture of gun wads, when such articles are imported by the manufacturers of shot shells, cartridges and gun wads, to be used for these purposes only in their own factories, until such time as the said articles are manufactured in Canada, provided always that the said articles when imported, shall be entered only at such port or ports, as may be named by the Comptroller of Customs, and at no other place, samples of such articles to be furnished to the collector of said port or ports by the Customs Department for the guidance of officer when accepting free entries of such materials.

Molasses, second process, or molasses derived from the manufacture of molasses; sugar testing by polariscope less than thirty-five degrees when imported by manufacturers of blacking for use in their own factories in the manufacture of blacking conditional that the importers shall in addition to making oath at the time of entry, that such molasses is imported for such use and will not be used for any other purpose, cause such molasses to be once mixed in a proper tank made for the purpose, with at least one-fifth of the quantity thereof of cod or other oil whereby such molasses may be rendered unfit for any other use, such mixing to be done in the presence of a customs officer at the expense of the importer, and under such further regulations as may from time to time be considered necessary in the interest and protection of the revenue, and that until such mixing is done and duly certified in the face of the entry thereof by such customs officer, the entry shall be held to be incomplete and the molasses subject to the usual rate of duty as when imported for any other purpose.

Horse hair, not further manufactured than simply cleaned or dyed, imported for use in the manufacture of horsehair cloths.

Mohair cloths or other manufactures of cloth, when imported by manufacturers of buttons for use in their own factories, and woven or made in patterns of such size, shape or form, or cut in such manner as to be fit for covering buttons exclusively, the conditions to be ascertained by special examination by the proper officer of customs, and so certified on the face of each entry.

Oleo stearine and degrass, when imported by manufacturers of leather for use in the manufacture of leather in their factories.

Platinum and black oxide of copper for use in the manufacture of chlorate.

Potash chlorate if not further prepared than ground and free from admixture with any other substance.

Rolled iron tubes not welded, under 1½ inch in diameter, angle iron nine and 10 gauge, not over 1½ inch wide, iron tubing, lacquered or brass covered, not over 1½ inch in diameter, all of which are to be cut to lengths for the manufacture of bedsteads, and to be used for no other purpose; when imported for the manufacturers of iron bedsteads to be used for these purposes only in their factories until such time as any of the said articles are manufactured in Canada.

Sawdust of the following woods: Amaranth, cocobora, boxwood, cherry, chestnut, walnut, gunwood, mahogany, pitch pine, rosewood, sandalwood, sycamore, Spanish cedar, hickory, whitewood, African teak, black heart ebony, lignum vitæ, redwood, satinwood, white ash, persimmon, dogwood, red cedar and oak.

Square reeds and rawhide centres, textile leather or rubber heads, thumbs and tips of steel, iron or nickle caps, for whip ends, when imported by whip manufacturers for use in the manufacture of whips in their own factories.

Steel for the manufacture of hammers, augers and auger bits when imported for the manufacture of such articles for use in their own factories only.

Steel of Nos. 24 and 17 gauge, in sheets 63 inches long and from 18 to 32 inches wide for the manufacture of tubular bow sockets, when imported by the manufacturers of such articles for use in their own factories only.

Steel strip and flat steel wire, when imported into Canada by the manufacturers of buckthorns, plain, strip fencing and safety barb-wire fencing for use in their own factories in the manufacture thereof.

Steel wire, Bessemer, soft drawn spring, of No. 10, 12 and 13 gauge

respectively and spring steel wire of Nos. 11 and 12 gauge respectively, when imported by manufacturers of wire mattresses to be used in their own factories in the manufacture of such articles.

Typewriter tables, with movable fixtures, and musical instruments when imported by and for the use of schools for the blind and being and remaining the sole property of the governing bodies of such schools and not of private individuals, the above particulars to be verified by special affidavit on each entry when presented.

Yarn spun from the hair of the Alpaca or Angora goat, when imported by manufacturers of braids for use exclusively in their factories in the manufacture of such braids only under such regulations as may be adopted by the Comptroller of Customs.

Provided, that with respect to goods imported for manufacturing purposes admissible under this act for any specific purpose at a lower rate of duty than would otherwise be chargeable, or exempt from duty, the importer claiming such exemptions from duty or proportionate exemptions from duty shall make and subscribe to the following affidavit or affirmation before the Collector of Customs at the port of entry:

(1) I, the undersigned importer of the (2) mentioned in this entry do solemnly (3) that such (4) are imported by me for the manufacture of (5) in my own factory, situated at (6) at that no portion of the same will be used for any other purpose, or disposed of until so manufactured.

(1) Name of the importer. (2) Name of the goods or articles, (3) swear or affirm, (4) name of the goods or articles, (5) name of the goods to be manufactured, (6) name of the place, county and province.

EDITORIAL NOTES.

The Trades and Labour Council of Toronto have appointed a deputation to interview the Dominion Government and oppose the reduction of the duty upon stereotype plate. This duty at the present time runs up in any case to over one hundred per cent. It is in great demand for newspaper purposes and enables the publishers to give variety to their columns and to supply more interesting reading matter at comparatively small expense than otherwise could be done. What advantage it can be to the country at large to keep up this heavy tax we are unable to see. A fair rate of duty for revenue purposes and for the protection of similar industry in this country the publishers are willing to have retained, but there can be no justice in the maintenance of a tariff which restricts the market and the opportunities of Canadian papers to the extent that the duties on stereotype plate do.—Ottawa Citizen.

Our esteemed contemporary cannot truthfully boast of possessing a liberal spirit, neither does it display much consistency as an advocate of the National Policy when it objects to the continuance of the duty upon stereotype plate. There are numerous establishments in Canada well prepared to make stereotype and electrotype plate for newspaper work, the industry giving employment to large numbers of most intelligent and valuable workmen. Why, pray, should these be deprived of their occupation to the end that cheap Canadian newspapers should have better facilities for loading their columns with the but too often nasty stuff that characterizes the cheap American papers. Instead of admitting these plates duty free they should be excluded from the country, or at least be subjected to much higher duties than now prevail.

The best way to stimulate our foreign trade is to buy what we want where we can get it the cheapest, and sell what we have to sell where we can get the best prices. It is not specially complicated.—The Globe.

Stimulated effects are frequently very injurious and should not be indulged in. The Globe is afflicted with cheapness on the brain. In many instances cheapness is a curse rather than a blessing. It is not always well to buy where we can supply our wants the cheapest, particularly if by buying abroad we destroy home industries and throw labor into enforced idleness. Canada does not desire to carry all her eggs in one basket, neither does she

desire to concentrate her energies in growing wheat and abandon her greatly diversified industries merely because some lines of manufactured goods may be obtained cheaper abroad than at home. Turn the employes out of the factories and workshops, and they must go to farming must starve or must leave the country. They should not be compelled to do either. Live and let live.

An Ottawa telegram states that "the Minister of Militia is making an arrangement with the British authorities to take over 6000 stand of the rifles now in possession of the Militia Department and have them converted into Martini-Remfords, upon the plans suggested by Major-General Herbert. This will give the militia 14,000 stand of modern arms." This is the old, old story. Why send these arms to Great Britain to be remodelled? Why not do the work at home? Why not have arsenals of our own where all such work could be done? When will we have a national policy that will be observed by the Government in practice as well as in theory?

Maine has entered on the experiment of building vessels of steel, and our Maritime Provinces are anxious to know whether they cannot follow the example. With steel ships came a revolution in ship-building, which imperilled, not to say doomed, a great and natural Canadian industry. While the materials for ships were drawn from the forest Canada had a distinct advantage over countries which had to import the raw material. Maine enters on the building of steel vessels without either iron or coal of her own, and therefore at a disadvantage as compared with Nova Scotia and New Brunswick, which have not yet entered on the experiment. Their turn will come, though exactly when it is impossible to foresee. The Maine incident has awakened attention to the conditions of the construction of steel vessels in the Maritime Provinces. The real comparison is of course not with Maine, but with other countries which possess special aptitude for building steel vessels. First efforts of this kind must be tentative, and as they are liable to be carried on under unusual difficulties, it requires no small stock of courage to put them forth.—Monetary Times.

We are rejoiced to learn that the time will come when Nova Scotia and New Brunswick will become possessors of a valuable steel ship building industry. Of course, it is impossible, however, for The Monetary Times or any one else to foresee exactly when that time is to arrive. It will never arrive as long as we are under the ban of such laws as now make that industry impossible. Whether it is possible for Canada to change these laws we cannot now say; for as long as the British flag flies over this country, just so long, it is probable, any ship flying the British flag will be entitled to all the rights and privileges accorded any Canadian ship. In fact, existing laws operate most disastrously and effectively against iron ship building in Canada. A ship built in the United States could not be admitted to registry in Canada without the payment of import duty, but she can proceed to Newfoundland and there obtain registry under the British flag, without the payment of duty, and then, having thus become entitled to fly the British flag, may return to Canada and enter into active competition with Canadian built vessels.

Sir John Thompson declared at the Halifax banquet that the Government's policy was that goods produced in

an American factory, and which could be produced in Canada, should pay the duty. By this he meant that the people buying such goods should pay the duty. The effect of this policy is to compel people who buy similar goods of Canadian manufacture to pay a similar duty. When goods of Canadian and American manufacture are exposed for sale together the prices are equal for equal quality. The buyer must pay as much for the Canadian product which has made no contribution to the revenue, as for the American product on which the duty has been levied. He is taxed in both cases by the restriction. On the American goods the tax goes to the Government, on the Canadian goods to the encouraged manufacturer. This is the vicious principle of protection, which levies more taxation on the people than is received by the Government; and the Ministry is still committed to it.—The Globe.

For instance: Last year Canada imported 34,500 barrels of flour for home consumption, chiefly from the United States, upon which 75 cents per barrel duty was paid; but during the same year Canada exported 410,000 barrels of flour. Now the Globe must know that the consumers of the 34,500 barrels of imported flour did not pay 75 cents per barrel more for it than what it was intrinsically worth when we were overstocked with flour to the extent of 410,000 barrels, which we had to export. The Globe must also know the fact that many other kinds of Canadian products, such as certain lines of blankets, tweeds, etc., are disposed of to home consumers at no higher prices than similar goods are sold at to consumers in Great Britain where they are produced. Competition has equalized prices, and protection gives the home market to home manufacturers.

The Toronto World in an editorial entitled "An Example Ontario Should Follow," says:—

The Chilean Government, despite the fact it constitutes one of those South American Republics that can furnish a revolution on twenty-four hour's notice, is fully alive to the advantages of cultivating an iron industry within its own limits. The country has a population of less than 3,000,000 according to Whitaker's Almanac. Chili, however, is an independent country and has to rely on its own resources in case of war. Chili has gun boats of its own, and it is a country therefore that can probably appreciate better than Canada the advantages that an iron industry confers upon a country. To further the manufacture of iron and steel all the scrap iron and steel belonging to the Republic is given free for three years to the concessionaire that undertakes to start the industry. All pieces of rail not exceeding two feet in length are also to be given free. At the conclusion of this period the concessionaire may obtain such scraps at 7s 4d per ton for 15 years. He may also import free of duty for 10 years sulphuric acid, hydrochloric acid, borax, sal ammoniac and metallic antimony up to a total value of £3000 per annum. It is proposed to erect the works at Talcahuano. If a country that is subject to so much disturbance as Chili can give this encouragement, why shouldn't the rich Province of Ontario do something to develop its mines?

It is somewhat remarkable that The World should advise the Province of Ontario to follow the lead of Chili, particularly in tariff matters, when it well knows that it has no power or authority to do so; and it is even more remarkable that The World does not vigorously urge upon the Dominion of Canada to adopt a policy similar to that of Chili, well knowing that the Dominion Government alone could undertake such a policy. No doubt the Ontario Government could do a great deal towards building

up iron and steel works if they were established; but no inducements that it could offer could effect that desideratum unless the tariff, made by the Dominion Government, was shaped with that result specially in view. If The World desires to see the rich Province of Ontario do something to develop the iron industry, it should urge the Dominion Government to take the lead by a proper arrangement of the tariff.

A press telegram from Ottawa a few days ago stated that a deputation consisting of Messrs. C. W. Taylor, of the Toronto Globe, G. H. Flint, of the Montreal Witness, Hugh Graham, of the Montreal Star, and E. P. O'Connor, of the Montreal Herald, were in that city asking the Government to reduce the duties upon patent medicines. It was represented that the proprietors of American patent medicines used to be large advertisers, but that of late their advertising had been seriously reduced on account of the competition of Canadian patent medicines fostered by the present tariff. Some of the medicinal preparations now advertised in these and other papers render them unfit to be admitted into residences where they can be inspected by women and children; and these so-called leaders of thought are beseeching the Government to afford them even greater facilities for advertising their "before and after" snyde business. In the cause of common morality it is to be hoped that the prayer of these newspapers be not heard.

The Toronto Globe informs us that "the exports of household effects (articles taken across the lines by persons leaving the Dominion) in 1893 were valued at \$1,303,379." The Trade and Navigation returns inform us that the value of such goods, the produce of Canada, that is, the property of Canadians leaving the country, was \$1,283,264. The returns also tell us that last year the value of settlers' effects brought into Canada was \$2,223,269, of which \$1,602,759 came from the United States. If the facts are of any special importance they show that a much stronger tide of immigration is flowing from the United States into Canada than that going the other way.

A large proportion of the taxes in Ontario goes for education. Is there any better purpose that it could go for? What prospect would a majority of our children have in this world if they could not get an education? There are comparatively few men in this young country rich enough to send their children abroad for their education. If we had no schools or colleges of our own nine-tenths of our children would grow up in ignorance. Our sons would be day laborers for the American Republic and our daughters would not be able to read. Thank heaven for Ontario schools! They are well worth much more than they cost.—"Knoxonian" in Canadian Presbyterian.

If by "schools" is meant common schools, which are open to all the children of the land, and in which is imparted instruction in those fundamental principles of education which fits the pupil for the ordinary affairs of life, then we are agreed to the proposition, and also thank heaven, earth, seas and our legislators for our schools. But if the term is intended to include colleges and universities, which only the sons of the wealthy can attend, then we do not feel quite so thankful. In fact we object. To maintain these colleges and universities at the public expense is to maintain a system that takes from the poor

and gives to the rich. Up to a certain point the sons of both poor and rich may, in the public schools, receive equal educational advantages. Beyond that point the son of the poor man must begin to hustle for himself because the parent cannot afford to send him to college. The rich man, however, desiring to have his son receive a higher education, to be obtained only in the college, should be permitted to bear that expense himself, and not compel the poor man to share it with him. When young people have imbibed all the education that may be imparted to them in the public schools, it cannot be that they will grow up in ignorance, except of foreign languages and of theology, law and medicine; and however desirable this sort of education may be to those who desire to become professional men, it is not at all essential to the ordinary working man. Fine colleges, like fine churches, are more ornamental than essential; and those who desire to have them should have the privilege of supporting them. They should not be supported by public taxation.

The April number of *The Canadian Magazine* is excellent, both in the variety and quality of the contents, and in typographical appearance. Readers of this most creditable periodical will be pleased to find the first instalment of a new narrative of travel in the far north, by William Ogilvie, F.R.G.S. The story, which is that of an exploratory survey on the Athabasca, Peace and Liard rivers, is entitled "In North-Western Wilds," and is well illustrated, and full of interesting facts and incidents. "In the Lumber Woods," another illustrated article, by E.C. Grant and Alan Sullivan, graphically portrays the lumberman's life in the shanty and on the river. Lieut.-Governor Schultz, of Manitoba, contributes a very interesting illustrated article on "A Forgotten Northern Fortress," telling the history of the huge and still well-preserved Fort Prince of Wales, which looks out with its rubbish-covered cannon on the chill waters of Hudson's Bay. H. Spencer Howell, in "Emblems and their Significance," makes a strong case in favor of a simple coat of arms for the Canadian flag. *The Canadian Magazine* is published for \$2.50 per annum by the Ontario Publishing Co., Ltd., Canada Life Buildings, Toronto.

Scribner's Magazine for April opens with the second of Octave Thanet's sketches on American Types, suggested by her observations among the State buildings during the World's Fair. In this article she describes "The Farmer in the South," whom she knows very well at home, as it is her custom to spend every winter on a plantation in Arkansas. The illustrations by A. B. Frost are in his very best manner. A very different type of character is described by H.C. Bunner in his "Bowery and Bohemia." His great familiarity with the phases of New York life enables Mr. Bunner to describe a type, "the real Bohemian," who is very little known and imperfectly understood by the general public. It is fully illustrated with sketches by Clinedinst.

In *The Literary Digest* for week ending April 14 among Topics of the Day was: the Troubles in South Carolina over the Dispensary Law; the Tariff Debate; the Behring Sea Question; Politics and the Saloon; the Liquor Traffic Without Private Profits; Mr. Gladstone's Retirement; Canadian Politics, etc. Under Science was: Submarine Photography; Artificial Sugar; Preservation of Milk, etc. The number is exceptionally full of information and papers of great interest, liberally illustrated. \$3.00 per year; 10 cents per copy at newsstands, or of the publishers, Funk & Wagnalls Company, 18-20 Astor Place, New York.

Godey's Magazine for April is another splendid number of this old-time and favorite Magazine. Its leading article is a continuation of the papers begun in the number before by Frederick W. Seward, and describes Secretary Seward's West India Cruise; it is profusely illustrated. There are the opening chapters of a serial story by Frederic Reddall, called *Loyal Foes*, and magnificently illustrated by Robert W. Chambers. The Countess Annie de Montague contributes a story on the Ghost Train, and there are three illustrated articles—*Little Strangers* in Gray, Monte Carlo, and Fans of the Orient, all beautifully illustrated.

Two well-known Toronto trade journals, *The Canada Lumberman* and *Canadian Miller*, have passed into new hands, Mr. Charles H. Mortimer, the publisher of *The Canadian Architect and Builder*, and *Electrical News*, becoming proprietor. Mr. Mortimer's success with the two last-named journals may be accepted as an evidence of the position the additional ventures will be sure to attain in his hands. The editorial staff remains unchanged. Mr. J. S. Robertson, who has been editor of *The Lumberman* and *The Miller* for the past three years, continuing his position on the staff of these journals.

The personnel of *The Montreal Trade Review* has undergone an important change. Mr. Henry Harvey, the proprietor, has associat-

ed with Mr. Charles Foley, and the firm name is now Henry Harvey & Co. The *Trade Review* has been very greatly improved in personal appearance as well as in literary character.

The recent special number of *Le Prix Courant*, Montreal, was excellently got up and reflects much credit upon the publishers. The number contained ninety pages enclosed in a beautiful and suggestive cover, lithographed in colors.

The Montreal Daily Herald, which furnishes its readers with full reports of the session, Dominion Parliament, announces that this year it will give its weekly readers a four-page Parliamentary supplement, containing its entire daily report. Concurrently with the Dominion session will be held the Imperial Parliament, which will also be of special interest and will be fully reported in the *Herald's* weekly supplement. The whole making a valuable history of the actions of these great bodies.

Never before have the glories of Western North Carolina and Northern Georgia been so brilliantly pictured in words as Mr. James R. Randall, the poet, has done for the March number of the *Southern States* magazine, of Baltimore, Md. Under the touch of his glowing pen the transcendent charms of this enchanted and entrancing region for the first time have adequate portrayal. The *Southern States* is published by the *Manufacturers' Record Publishing Co.*, Baltimore, at \$1.50 a year.

Messrs. C.A. Dockham & Co., Boston, Mass., publishers of *Dockham's American Trade Reports*, inform us that they are now at work upon the fifteenth edition of their *Textile Manufacture and Dry Goods Trade for the United States and Canada*. The contents have reference to concerns in both countries, and will include cotton, woolen, knit goods, silk, linen, jute, flax and wool hat manufacturers, bleacheries, dyers and finishers, print works, yarn dealers; Cotton Dealers—merchants, factors, brokers, etc.; Wool Dealers—growers, buyers, dealers, commission, brokers, Scourers, etc. The mill information will be as follows:—Name of manufactory; officers and capital—if incorporated; firm name; kind of goods made, with description of same, and, if yarns, sizes and system; number of ring or mule spindles; number of sets of wool cards; number of looms; number of worsted combs; number of worsted spindles; kind and number of yarns or warps bought; number of knitting machines or cylinders; number of sewing machines; selling agents; post-office and freight addresses; location of mill; steam or water power; if dye and finish own goods, and who they are successors to.

Edward Bellamy tells a singularly interesting story in his account of "How I wrote 'Looking Backward'" in the *April Ladies' Home Journal*. Not less personally interesting is William Dean Howells in the fifth article of his literary autobiography, "My Literary Passions." Practical in its letter-press and beautiful in illustrations is an article on "The Care of a St. Bernard Dog," by Alexander Mackenzie-Hughes, manager of the New York St. Bernard Kennels. A love-ballad, very musical, by George Woodill, entitled "Tell Me," is given in its full piano score. Robert J. Burdette defines the attitude of the father toward a son; Palmer Cox has his "Brownies" in Florida; a full page of four articles tells women how to open bank accounts, keep household expenses, and how to make a will. The *Journal* is published by *The Curtis Publishing Company* of Philadelphia, for one dollar per year, or ten cents per copy.

Among the writers of articles in *The Popular Science Monthly* for April are the well-known names of Andrew D. White, Herbert Spencer, Alfred R. Wallace, James D. Dana, and Joseph Le Conte. Dr. White contributes another chapter in the *Warfare of Science* series, dealing with Theological Teachings regarding the Animals and Man. Under the title *Trusts* their own Corrective, Mr. George A. Rich shows that combinations which have sought to make unreasonable profits have worked their own destruction. In *New Lights on the Problem of Flying*, an illustrated article, Prof. Joseph Le Conte discusses some recent experiments by Prof. Langley, and admits that human flight is not the impossibility that he has declared it to be. The Method of Homing Pigeons is described, with many diagrams, by Prof. C.F. Hodge, who shows that the birds have no such inscrutable instinct as they have been credited with. The system of aerial telegraphy invented by Claude Chappe is described by Walter Lodian in a fully illustrated article entitled *A Century of the Telegraph in France*. In *An Illustrative Chapter of Legal Development* some facts concerning the ownership of land that will surprise the average real-estate owner are given by William W. Billson. Two timely topics, *The Unemployed and Why Beneficence should not be Enforced*, are discussed in the *Editor's Table*. New York: D. Appleton & Company. Fifty cents a number, \$5 a year.

Outing for April contains the usual variety of material for the lover of nature and sport. "Quaint Artist Haunts in Brittany," by Birge L. Harrison, gives a delightful glimpse of the life of the celebrated French and American painters while preparing their pictures for the salon. "Six Months with a University Crew," by R.D. Paine, a noted Yale oarsman, gives an inside glimpse of the crew man's life, which has hitherto been described chiefly from the point of view of the newspaper reporter. "Fishing with the Spear," by Ed. W. Sandys, is quite in the style of the author's well-known sporting sketches, full of rollicking fun and sport. "My First International Yacht Race," by Lieut. William Henn, R.N., describes a day's sport near the Suez Canal. *Outing*, 239 Fifth Ave., New York.

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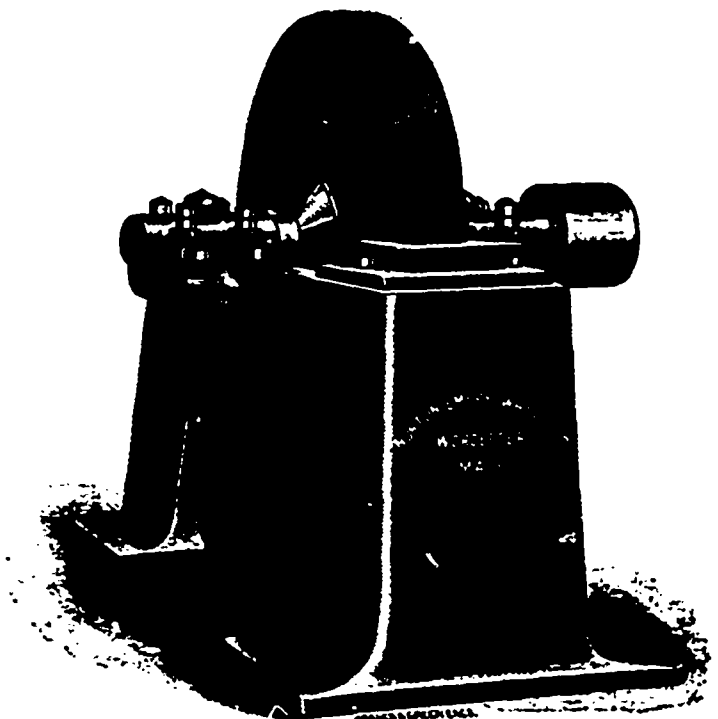
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... WORCESTER, MASS. ...

Electrical Progress Since 1876.

Prof. A. E. Dolbear is the author of an article published in *The Cosmopolitan*, showing the amazing advance in the application of electricity since 1876. Then, he says, electrical apparatus consisted mostly of telegraph devices, galvanic batteries, static machines, Leyden jars, etc., for school illustrations and measuring instruments, such as galvanometers and resistance coils. There were a few crude dynamos and one small imported Gramme machine, none of them intended to maintain more than one arc light. Now there is rivalry for space in which to exhibit dynamos capable of lighting fifty or more in one circuit. Then there was not a single incandescent lamp in the world. Now they are to be seen by the tens of thousand, and with all degrees of brightness, from that of a tallow dip to those but little inferior to the arc itself, and every exhibit is thus lighted. Then there was not a single electrical motor that was more than a toy to be run by a galvanic cell. Now motors for all kinds of service from driving a fan to those driving printing presses, looms, machine shops and threatening the existence of the locomotive itself.

Then all welding was done by hammering at the forge. Now electricity heats the ends to be joined, and, in less time than it takes to describe the process, heavy bars and rails may be welded even better than was possible to weld steel or other metals than iron. Now almost any metal may be electrically welded to another metal as easily as iron to iron. Then there were induction coils for producing sparks a few inches long. Now such sparks are made five feet long, and it is believed could be made fifty feet long if it was worth while. Then induction coils were employed only for changing low potentials to higher. Now the transformer reverses the process and makes electric lighting feasible miles away from the dynamo. Then it was possible to send but two telegraphic messages in opposite directions simultaneously. Now seventy-two messages can be sent, thirty-six in each direction, on one wire without interference. Then the telephone was first exhibited on a line the length of a building. Now one can talk with one another a thousand miles away.

Then it was believed that a continuous conductor was essential for doing any kind of electrical work. Now it is shown that all kinds of such work may be done without material connections. Then it was thought that light was one of the physical forces. Now it is believed to be an electro-magnetic wave. Then it was believed and taught that electricity could never be economically employed for driving machinery, and that its light could not be subdivided. Now it is believed electricity is in its infancy.

Tesla's Demonstration Concerning Light.

Nikola Tesla has demonstrated that the phenomenon of light is producible in four different ways by the action of high frequency electricity upon suitable media. One of these methods is the incandescence of a solid, consisting of a small carbon button mounted upon a platinum wire in an exhaust bulb. When Tesla connected his body with one of the terminals of a high tension transformer and took an arrangement of this kind in his hand, the button became luminous. Next he took a highly exhausted bulb containing a strongly phosphorescent body, above which was mounted a small plate of aluminum on a platinum wire leading to the outside; and the currents flowing through his body excited intense phosphorescence in the bulb. Thirdly he took in his hand a simple exhausted tube, and in the same manner the gas inside the tube was rendered highly incandescent or phosphorescent. Finally he took in his hand a metallic wire which appeared covered with a luminous film through the intensity of the electrical vibration. Tesla is now engaged upon the problem of producing these effects with less expenditure of energy than was employed in the operation as first arranged by him. Either method of converting molecular bombardment into light without heat, provided that it could be done economically, would be a considerable step forward in the direction where "the light of the future" is supposed to await its fortunate discoverer.—The Safety Valve.

McEachren's System of Heating, Drying and Ventilating.

Mr. J. D. McEachren, of Galt, Ont., informs us that he is meeting with very gratifying success in the manufacture and sale of the heating, drying and ventilating apparatus invented by him and illustrated in his business card in page 331 of this journal.

In speaking of his apparatus Mr. McEachren directs attention to the fact that open fans will not force or exhaust air against resistance; that they will not draw or force a full volume of air through pipes that are not the full diameter of the fan; and there should be but few elbows and very easy turns, and the pipes not very long.

In the construction of the McEachren fan the frame is curved so as to come down in front of the blades. This enables the fan to hold all the air it gets; and as all fans take in air at or near the centre and discharge it at the periphery, this small reduction in the opening does not at all diminish its capacity for taking air. The blades are curved or concaved as far as the centre, and are set at an angle such as will best answer to take in the largest quantity of air; and from the centre backwards the blades curve or bevel in the opposite direction so as to give the greatest possible forcing power. The air thus forced cannot return between the wheel and casing, as is common in open fans.

The McEachren fan is specially adapted for ventilating, and the re-

moval of dust from flax mills, rag cutters, rag dusters, carpet cleaning establishments, sand papering machines, etc.; smoke, gas and unpleasant odors from blacksmith shops, glue factories, etc.; steam from dye houses, paper mills, felt factories, laundries, soap works, etc., and in tanneries for drying leather, causing a uniform and constant change of air throughout the entire building independent of all atmospheric conditions.

Speaking of the ventilating capacities of his fan Mr. McEachren says:—

For churches, schoolrooms, halls, etc., heated by furnaces, stoves, steam radiators, etc., these fans may be placed either in the cupola or the basement. They should be so arranged as to draw the cold air off the floors in winter, and the heated air from the ceiling in summer and allow fresh air to flow in about the floor line. No draft can be perceived if properly arranged. A building heated by a furnace can be raised to a given temperature in half the usual time, and with less fuel, by having a ventilating fan properly applied. Then in summer, instead of sitting in a close room, breathing the same air over every five minutes, you can have all the air in the building changed once in three or four minutes. Such conditions would cause people to go to church in summer for comfort, as well as for instruction, instead of, as is now the case, make up their mind to bear the uncomfortableness of a crowded house, with no ventilation, as a matter of duty and example, or for the sake of the instruction expected. I give the above as the best way of making a comfortable audience room, out of one that is now very uncomfortable, without changing present system or going to much expense.

The best method of heating and ventilating large buildings, school rooms, etc., is the hot blast system. In this system you have no red hot plates for the air to pass over and become deprived of oxygen before it enters your lungs, and you secure a constant and regular change of fresh air, in all conditions of outside atmosphere. The pressure is outward and all drafts around openings are unknown. At all openings there is an outward current of warm air.

For factories of all kinds the blast heating system is best. It heats quicker and even, and is more readily controlled than any other; causes a regular change of air either in summer or winter, and costs no more than the usual direct heating system of piping over head or around the rooms.

The McEachren apparatus is specially adapted for blowing boiler furnaces, with the object of using screenings, pea coal and other cheap fuel, but it is of a decided advantage in the use of the best coal or wood, as with the fan a much larger amount of oxygen is forced into the fire. The gases are better consumed, the grate bars are kept cooler and the fires can be regulated to suit immediate requirements.

CAPTAINS OF INDUSTRY

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

A roller flour mill is to be built at Rosenfield, Man.

A new court house will be built at Portage la Prairie, Man.

Mr. E. Todd has moved his saw mill from Clavering to Brantford, Ont.

D. P. McDougall & Co., Maxville, Ont., have started up their saw mill.

A sash factory has been started at Salmon Arm, B.C., by Mr. Bolton.

A new saw mill is to be built at Selkirk, Man., by Mr. Mitchell, of Mellwood, Man.

The grain elevator at Belwood, Ont., was destroyed by fire April 9; loss about \$6,000.

A saw mill will be built at Fredericton, N. B., by Donald Fraser, of River du Chute, N. B.

Wm. W. Smith has leased and will operate the oatmeal mill at Portage la Prairie, Man.

The Banner File Company, Almonte, Ont., will increase their plant by adding more machinery.

Windsor Electric Light Co., Windsor, N. S., are installing a 1000 light Westinghouse plant.

The Chaudiere Electric Light Co. have installed another 3000 light Westinghouse machine.

W.R. Cahoon, Marquette, Man., whose flour mill was destroyed a short time since; will rebuild.

A. Ramage, Chesley, Ont., has installed a 600 light Westinghouse alternating electric light plant.

C. Mills, of Wheatley, Ont., has purchased the saw mill at Windfall, Ont., formerly run by Mr. Shaw.

The Graybill Mfg. Co., Waterloo, Ont., are building a large addition to their furniture factory.

Mr. C. E. Moyer, Berlin, Ont., has started a factory for the manufacture of ironine collars and cuffs.

J. J. Collins, Ottawa, is president of a new company who will erect a roller grist mill at Ruther Glen, N.B.

The new factory of the Quebec Paper Bag Co., at St. Sauveur, Que., has been completed and put in operation.

R. Thackray & Sons, Ottawa, have bought of W. Campbell & Co., same place, a 150 h.p. boiler for their planing mill.

P. J. Powers & Co., Ottawa, have just completed six new boilers for W.C. Edwards & Co's saw mill at Rockland, Ont.

Mattawa, Man. is offering a cash bonus of over \$2,000 and exemption from taxation to any one that will erect a grist mill there.

The Canada Carriage Company shipped seven car loads of their vehicles a few days ago to Prince Edward Island from their Brockville factory.

The St. Hyacinthe Gas Company, St. Hyacinthe, Que., are putting in a 700 light incandescent plant bought from Ahern & Soper, Ottawa.

The saw mill belonging to Chas. Brewer at Armstrong, B.C., has been purchased by Messrs. E. C. Gargett & Co., who will add new machinery.

The Jenckes Machine Co., of Sherbrooke, Que., are installing one of their 1230 Corliss engines at the new works of the Troy Laundry in Montreal.

The works of the Ontario Car Co., at London, Ont., which have not been in use for some time, were badly damaged by fire on April 4; loss about \$5,000.

The Jenckes Machine Co., Sherbrooke, are running their work, night and day on large orders for the Dominion Coal Co.'s new plant at Cape Breton and Montreal.

The town of St. Boniface, Man., proposes to build another bridge across the Red river, and has asked the Winnipeg City Council to vote \$10,000 in aid of the enterprise.

Arrangements having been made with the mortgagees of the Napanee Paper Company, the mills are now put in operation. New capital has been added, and John R. Scott is manager.

The Ottawa Car Company are building eleven cars for the Hamilton & Grimshy Electric Railway, one for the Peterborough Electric Railway, nine for Montreal, and ten for Ottawa.

Messrs. Ahern & Soper, Ottawa, have been awarded the contract for the whole construction of the Galt & Preston Electric Ry., including three motor cars and a 200 h.p. generator.

The Ottawa Car Company, Ottawa, are building a large addition to their factory. The building is 100x30 feet, three stories high and will have a very large elevator outside to take up street cars.

The Richelieu & Ontario Navigation Company have lately given an order to Ahern & Soper, Ottawa, for two electric plants for their boats. These are slow speed dynamos adapted to direct coupling.

The Stratford Bridge & Iron Works, Stratford, Ont., will enlarge their works this spring. They will add a two-story building 85x30 ft. and another 123x40 ft. one story, also a boiler house, and will add considerable new machinery.

Captain J. Donnelly, of Kingston, Ont., who has recently visited and inspected the new Canadian ship canal at Sault Ste. Marie has the following to say regarding that important work: "There are two points interesting to mariners, especially to large boats coming to Kingston. One is that the span for the drawbridge at the entrance to the lock is not wide enough. On the American side of the canal the draw is 200 feet wide, while on the Canadian side it is 90 feet, with a square abutment that sits right in the centre of the canal. It will be a serious menace to vessels using the canal. Another point that struck me very forcibly was that the entrance to the lock where the vessels first touch the stone work is built of the very roughest stone, instead of being levelled like the Kingston dry dock. This will, no doubt, injure vessels to a great extent. It will be impossible to put a fender between the vessel and stone work. The abutment should be removed and the drawbridge made the full width of the canal. With the exception of these objections the work is the finest mason work I ever viewed. The mason work is 44 feet high and the lock itself, 6,800 feet long by 60 feet wide. The gates are iron and are to be swung by electricity, the first experiment ever made on the continent. An experiment was made at the Beauharnois canal last fall in view of adopting it at the Soo. It worked well. The first electric rock drill ever used on the continent is used there, and has turned out to be a great success. It was manufactured by the Peterborough Electric Company. The water will enter the lock through a wrought iron pipe in the bottom, instead of coming through by the head gates as in all other canals. The work is the biggest undertaking Canada has ever tackled. When completed Canada will be independent of the American canal altogether, and there will be no more talk of tolls or rebates." The Government has promised the contractor a bonus of \$100,000 if the work is completed by May 1. They are working hard for the bonus, and Capt. Donnelly thinks there is every chance of their getting it.

Messrs. Toner & Gregory, of Collingwood, Ont., have purchased the saw mill in that town belonging to the Georgian Bay Lumber Co.

W. B. Sanders, of Stouffville, Ont., is putting a new boiler into his steam yacht at Jackson's Point, Lake Simcoe. It will be of the Finlayson type and made by Doty Bros. & Co., of Toronto.

Messrs. Cheyne Bros., of Guelph, Ont., have purchased the Acton Flour Mills from John Harvey with all privileges. They intend remodelling the mill throughout and will put in full roller process machinery.

The furniture manufacturing firm of D. Hibner & Co., Berlin, Ont., have dissolved partnership. Mr. Hibner will carry on the business, while his late partner, Mr. S.T. Doolittle, will engage in a similar business in Ingersoll, Ont.

Messrs. Doty Bros. & Co., Toronto, report that they are meeting with considerable success in the introduction of the Finlayson water tube marine boiler. They have just shipped two of them to Stuart & Harper, Winnipeg, for steamers now being constructed on Lake Winnipeg.

The large factory of the Paris Carpet Company, at Paris, Ont., in which Mr. Henry Stroud was very largely interested, was destroyed by fire on April 3 entailing a loss of about \$40,000. It is understood that the company will rebuild, but it is possible that it will be at some other place.

Mr. W. H. Hepburn, boot and shoe manufacturer, Preston, is contemplating the removal of the factory from Preston to Guelph. A movement is on foot to establish a joint stock company with a capital of \$50,000. In the case of Mr. Hepburn coming to Guelph he will bring with him sixty men with an average of three to a family.—Guelph Mercury.

Messrs. Sadler, Dundas & Co. of Lindsay, Ont., are building a new steamer 55 feet long by 10 feet beam, the motive power to be a steep compound engine 6 in. by 10 in. with 6 in. cylinders, and a Finlayson patent water tube boiler built under government inspection for a working pressure of 200 lbs. per square inch. Doty Bros. & Co., Toronto, have the contract for the machinery.

The Haworth Belling Co., Toronto, are offering their Haworth's belting cement, making the suggestion that when belts are ordered it should be specified that they be made with lap joints, and made endless with this cement in place of lacing. In the directions for using this cement they say:—Heat in the same way as you would glue, in an ordinary glue pot. Apply a thin coat to each side of the splice, when hot, with a brush. Be sure not to let it "set" or get "chilled" before putting splice together, then rub down the splice with a "slicker," and if you have no press, use an ordinary hammer to pound the lap. If possible give a few hours time for cement to set. In cementing old belts be sure and scrape off the old glue before applying new cement. Do not use rivets. No use weakening the belt by punching out good leather, which breaks the fibre and cement too, then filling up the holes again with copper rivets.

The first of the Sharpe Cash Recorders put on the local market is now in operation in the bar of the Wellington hotel. It is manufactured by Mr. Chas. Raymond, to whom is due the credit for its beautiful design, and perfect mechanism. Mr. Raymond has devoted nearly two years to the perfection of this machine and the result is a fresh triumph for its inventor. The instrument is made in various styles. The one under notice will record any sale from 5c up to \$9.95 and add up to \$10,000. Another style will record any sale from 1c. up to \$40.00 and add up to \$100,000. It is the only machine in existence that will, without re-adjustment, continually add the receipts, even if they go up into the thousands. The working parts of the machine are all made of the best steel and the case is manufactured of brass, full nickled and handsomely finished. It is a decided ornament behind any counter as well as being the most useful and labor-saving acquisition to the furniture of a counting room. These machines are now being turned out in large numbers from the Raymond factory.—Guelph, Ont., Herald.

The Toronto Lithographing Co., Toronto, have sent us an assortment of most beautiful specimens of the photo lithographs made by them accompanied by a letter in which they say:—"Possibly no branch of engraving has developed so rapidly or improved so much in a comparatively short space of time as that of half-tone engraving. Improved processes, instruments and appliances have been discovered and invented which have materially assisted in the perfection that has been attained. Feeling the demand for a superior class of work in this line we have lately purchased an entirely new plant with all the latest and most improved machines, instruments and appliances, and at a very considerable expense have obtained control of the newest and best process known by which this work can be done to give the best results and with the least trouble to the printer, the work being deep and very sharp. Our half-tone engraving is no longer a purely mechanical process, but is possessed of thoroughly artistic merit. An advantage we claim is having in connection with our lithographic business a staff of skilled artists—specialists in their different lines—so that if a copy or photograph requires retouching, whether it be portrait, figure, mechanical or landscape, an artist best suited for the work takes it in hand. This is an exceedingly important point, as unless the copy or the original is good it is impossible to get a satisfactory reproduction.

Wm. Heyrock, of Goderich, Ont., is building a passenger steamer to be used in connection with his summer resort near Goderich. Doty Bros. & Co., Toronto, have the contract for the boiler and machinery. The boiler will be of the Finlayson type.

Attention is directed to the business card of Northey, Ltd., Toronto, to be found on the inside of our front cover. No more striking and unique advertisement could be presented. This concern, heretofore known as the Northey Mfg. Co., make a specialty of steam and hydraulic pumping machinery, and are numbered among the most extensive and best known in Canada. They are believers in the efficacy of printer's ink when used in connection with this journal, having had their business card in our pages for many years.

Capt. P. McSherry, of Toronto, has contrived an ingenious device which will greatly facilitate the handling of skiffs and other sailing craft rigged with a leg-o-mutton sail and what is called a split pole. Capt. McSherry's invention is literally a telescopic split pole. It is so arranged by means of part of it being a tube to slip down over the other part that reefing may be done in a skiff in a few minutes by the steerman without rising from his seat. There is a pin with a series of perforations, so that the sail may be set full out or let down to a mere leg-o-mutton. One important advantage of the device is that it will minimize the danger of capsizing. For ice boat rigging it is especially advantageous, enabling the work of reefing, which usually occupies about half an hour, to be done in ten minutes.

The original contract for the Sault Ste. Marie Canal provided for locks 600 feet in length by 85 feet in width, with 16 feet 3 inches of water on the mitre sill, the time allowed for the completion of the work being from November 20, 1888, to May 10, 1892. In the early part of 1891, upon representations being made on the importance of increasing the depth of water in the canal and the dimensions of the locks to 650 feet by 100 feet, negotiations were had with the contractors, resulting in an agreement dated June 13, 1891, by which the time for completion of the work was extended to May 10, 1893. In the early part of 1892 it was decided to further increase the size of the lock to 900 feet by 60 feet and the depth of water to 20 feet 3 inches, and the contractors undertook to make the change and complete the work by December 31, 1894. But in 1892 it was considered important to have the canal completed in the summer of 1894, and an agreement was entered into on November 8, 1892, whereby the contractors undertook to complete the masonry by December 31, 1893. The first stone in the construction of the lock was laid September 15, 1892. In consideration of additional work involved in changes made in the dimensions of the lock, the time for the completion of contract has been extended to June 30, 1894.

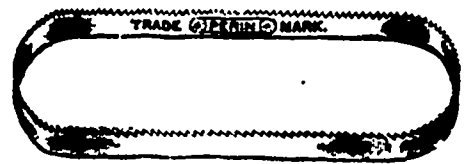
The Lamont Glass Factory, at Trenton, N. S., which was under going repairs, is in full blast again.

Fire in the foundry of Messrs. John Inglis & Sons, Toronto, on April 11, did damage to the extent of about \$5,000.

The Brantford, Ont., Street Railway Co. will probably extend their road to Echo Place, a beautiful summer resort near that city, at a cost of about \$10,000.

The Haworth Belting Co., Toronto, have just issued a beautiful brochure having reference to their business, and which contains a great deal of technical information which cannot but be useful to all users of power. The book contains the names of the concerns in Canada who are users of Haworth belting, and there are a large number of them, and it also contains testimonials from many of these who are unstinted in the good words they have to say concerning it. This concern make a specialty of dynamo belts, and hold many valuable testimonials from users of them, one of the latest dated being from the Kingston, Ont., Light, Heat and Power Co., who state that the two 36-inch Haworth driving belts made for their 2,300 horse power engines have given very great satisfaction—that they have been in constant use ever since October, 1892, and are still in first class order, showing that the material and workmanship are of the very best.

PERIN'S FRENCH BAND SAW BLADES



These blades are Joined, Set and Filed, ready for use, and stamped with M. Perin's name and Trade Mark. They are highly finished, even in temper, and the backs rounded and polished.
All widths from 1 to 1 1/2 inches X 17ft., 17ft. 10in., 18ft. 8in., and 20ft. 6in. always kept in stock.

RICE LEWIS & SON, Ltd.
Sole Agents for Canada
TORONTO.

Buffalo Planing Mill Exhaust Fans

EFFICIENCY
UNEQUALLED
DURABILITY
UNSURPASSED
SMOOTH
RUNNING
INCOMPARABLE

THE LARGEST

FORGE

Thirty-Eight Other Designs of Portable and Stationary Types.

BUFFALO LUMBER DRY KILNS
Blowers, Blacksmiths' Tools, etc.

St. Charles & Pringle
BELLEVILLE, ONT.

Manufacturers of
**Electric..
Cable...
and Horse
STREET CARS**

Omnibuses, Horse Wagons and Vehicles of All Description.

7-8 in. Tire, J. B. A. Sarven Wheels. 15-16 in. Steel Axle. 23 in. Wide Body.
Seat Comfortable for Two. Weight, about 200 lbs.
Can be used as above shown, and also with Sack on Seat and Top.

Thus Buyers Get Two Buggies Combined in One.
Best Material Throughout.

Ask for them. Catalogue FREE on Application.

J. B. Armstrong Manufacturing Co., Ltd.
Guelph, Canada.

Messrs. David Goldie, John Goldie, G.E. Goldie, and R. Nelson, of Ayr; and Hugh McCulloch, of Galt, Ont., are seeking incorporation as the Goldie Milling Company, with headquarters at Ayr, and a capital of \$180,000.

In a recent issue allusion was made to the Stickfast manufactured by Mr. H. R. Ridout, of Montreal, as being a cement. Stickfast is not a cement, out a belt dressing for preventing slipping and for keeping the belt pliable and increasing its power. Mr. Ridout informs us that he is enjoying a large demand for the article.

The John Starr, Son & Co., Ltd., of Halifax, N.S., manufacturers and importers of electrical supplies, make a specialty of their, "Starr" incandescent lamps to which they request attention in their business card. They allude to their lamps as being of full candle power, having long life and low in price. It is made of any desired candle power and voltage, and with bases to suit the different sockets in use. The company write us that they are selling large numbers of these lamps all over Canada, where they are giving universal satisfaction; and that they have also worked up quite a large trade in them in South American and other foreign ports. These lamps are very neat in appearance, their attractiveness being added to by the curled filament contained in them.

The coal trade in British Columbia is now said to be the chief industry. British Columbia coal has been proved to be superior to the United States article, and is reaching the markets of that country in direct competition with their product. By the War Department of the United States, Nanaimo coal is rated far above any found in Washington, Oregon or California. The output at Nanaimo is now over a million tons per annum, and the Jumbo island mines, when in full operation, will very materially increase the output. Besides these mines other rich veins are constantly being discovered. San Francisco draws its chief supply of coal from Nanaimo. In 1892 that city took 600,000 tons of Nanaimo coal. The American steamships to China and Australia use it exclusively. It goes to the Sandwich islands and Mexico, and other points on the Pacific. A circumstance which indicates how Canada's stake on that ocean is increasing is found in the fact that the American cruisers employed in guarding the seal fisheries in the Behring sea get their coal supply from Nanaimo, 5,000 tons recently being sent from one mine alone. It is stated that the British cruisers now using Welsh coal will shortly take large supplies of the Canadian commodity. The British Columbia mines furnish the Canadian Pacific railway with fuel to the Rockies, and also the C. P. R. steamers on the Pacific. Without these mines the C.P.R., including its fast military and postal service east from England to Australia, could not have been an accomplished fact.

The Royal Electric Lighting Company, of Montreal, have secured the contract for an incandescent plant and system for Mitchell, Ont. The plant is to be a five hundred light incandescent system, and will be put in during the summer months.

The shipbuilding industry of Collingwood, Ont., is in a very thriving condition. At this date there are five new vessels being built, three of them on the stocks nearly completed, and two ready to set up as soon as room can be made for them. The Collingwood Dry Dock Company are building one of these for the Buffalo Fish Company. She is 110 feet long, 20 feet beam and 8 feet hold. She will be launched about May 10 next. Mr. Alfred Mirrell has four new vessels in hand, one a steam yacht 100 feet long, 14 feet 6 inches beam and 6 feet 6 inches hold. She is owned by Mr. Pratt, of Parry Sound. Her cabins will be fitted up in first class style; her engines and boilers are being made there by the Georgian Bay Foundry and Machine Works. The engines will work up to 250 indicated horsepower. From the same shipyard three powerful tugs will be launched in a short time. These are 60 feet long, 13 feet 6 inches beam and 5 feet 8 inches hold. One of them is for Mr. McGinnis, of Meaford; one for Mr. T. Diner, Collingwood, and the other is for Mr. Medlin, Little Current. The Doty Iron Works, of Toronto, build engines and boilers for the first two, and the Georgian Bay works construct the motive power for the other one. The Collingwood Dry Dock Company have now in the dock the City of Midland, which is 187 feet long, 28 feet beam and 11 feet hold. This vessel has been lengthened some 30 feet this winter, and greatly strengthened with steel keelson and steel arches and carlins; her cabins have been made pleasant and roomy. She is now complete and will be ready to leave the dock in a few days. The wrecking tug Charlton is also in the dock, and has had 15 feet added to her this season, besides being strengthened and almost made new. She now measures 145 feet in length; 21 feet beam and 10 feet hold. There are also in the dock undergoing extensive repairs the tugs Arnold, 80 feet long, 18 feet beam and 8 feet hold; the Heisord, 75 feet long, 18 feet beam and 7 feet 6 inches hold; the Maud S., 55 feet long, 12 feet beam and 5 feet 6 inches hold. The actual measurements of the Collingwood dry dock are as follows: Length, 336 feet over all; width, 80 feet; depth, 13 feet to top of mitre sill. The entrance gate is 50 feet in width in the clear. There are at this moment six vessels in the dock undergoing extensive repairs, and there is ample room for them all. The Collingwood boat builders have been very busy all winter. William Watts & Son have turned out some 25 large fishing boats. P. Dougherty has also built a large number, and both builders have contracts yet to complete.

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Highest Economy, Regulation Perfect. Send for Circular. Interviews Desired.

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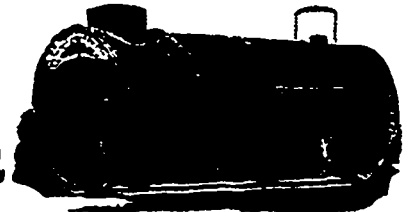
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Combines all the advantages of portable forms with the highest possible economy.

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AUTOMATIC HIGH SPEED ENGINES

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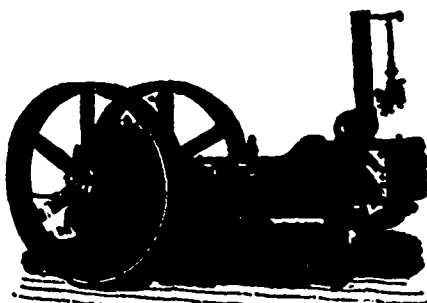
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On Railway Heads, Silver Lap Frames, Drawing Frames, Comber Draw Box, Slubbers and Speeders, Intermediate and Roving Frames, Jack Frames or Fly Frames.

The PATENT METALLIC ROLL is furnished for any make of these machines now in use. For new machinery the Metallic Roll is usually ordered through the builders of such machinery. All the leading builders and importers of the classes of machines named are agents for the Patent Metallic Roll, and we have furnished and are furnishing them with Metallic Rolls for many of their frames. For any desired information please address

THE METALLIC DRAWING ROLL CO.

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Exclusive Owners and Sole Patentees for the United States and Canada.

Messrs. St. Charles & Pringle, Belleville, Ont., who are manufacturers of electric, cable and horse street cars, omnibuses, hose wagons, etc., are successors to the well known St. Charles Omnibus Co., of that city. They have a large and well equipped works and are prepared to meet any and all demands that may be made upon them.

The Canada Machinery Agency, 345 and 347 St. James St., Montreal, have accepted the agency for that city of the Dodge Wood Split Pulley Co., and will carry a complete stock of all sizes of pulleys for immediate delivery and give every attention to the wants of pulley users in and about Montreal. This agency will be in the best possible position to supply a high class article at lowest possible prices.

The rumour having been circulated that the Canada Paint Co. would abandon their works in Toronto, and remove the machinery to their Montreal works, Mr. A. G. Peuchen, the Toronto manager, says:—We have no intention whatever of closing our Toronto factory. The statement is only true to the extent that we intend consolidating some departments in Montreal, where we already have a large establishment, our object being to save expenses. We get our raw material from Europe, and Montreal being a seaport we have only the first freight to pay. That is the principal item, but the consolidation will be advantageous in other ways. The works here, however, will be kept running in connection with other departments.

At the recent electrical convention in Washington City the W. S. Hill Electric Co., of Boston, were well represented by Messrs. W. S. Hill and George M. Poor, who exhibited some of the handsomest and most substantial switches at the convention. The exhibit consisted of a solid polished oak table four feet square, supporting two frames set diagonally and pitched like a roof meeting at the top, on which were mounted two solid slabs of Tennessee marble carrying the switches. The exhibit was complete in every detail, the whole being shipped from Boston in parts, and set up in Washington in 35 minutes. On one side was mounted a 1,000 ampere, three pole, double throw switch, one of a lot of 185 recently made and shipped to the Philadelphia Traction Company of Philadelphia. This switch occupied the whole of one side and is of the most solid construction and handsome appearance, the brass work being finished in the highest degree, as are all the switches made by this company. On the other slab or slate, a 1,000 ampere single pole double throw switch occupied the position of honor in the centre, flanked on either side by a 100 ampere, double pole, single throw switch, one having fuse connections on the face of the slab, and the other having similar connections on the back of the slab, showing the two methods of accomplishing the same object. Above the switches were shown on one side two new closet switches, and on the other side two Hill plug locking cutouts. On the left hand upper corner was shown a switchboard rheostat and on the other corner was shown the new Doane lightning arrester, illustrated in another column of this number. Lying loose on the table was shown a section of the regular Hill arc switchboard, showing the breaking and transfer plugs. The whole exhibit was extremely handsome and appropriate and reflected great credit on the Hill Company.

Rails for Sale - - -

800 tons New Steel Rails, 56 lbs to yard; Good English Make. Several lots Second-Hand Light Rails now in stock.

JNO. J. GARTSHORE, 49 Front St. W., Toronto.

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Highest Awards at the World's Fair, Chicago, upon

Lubricating, W.W. Illuminating Oils,
... Paraffine Wax, Etc. ...

WE MANUFACTURE

All Grades of Oils, Greases, Soap Stocks, Candles,
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Montreal, Que.	Chatham, Ont.
Kingston, Ont.	Windsor, Ont.
Toronto, Ont.	Winnipeg, Man.
Peterborough, Ont.	Vancouver, B. C.

Messrs. Gilmour & Co., Trenton, Ont., have placed a large Northey pump in their lumber mills.

The town of North Bay has added two Northey pumps to their pumping plant.

A Northey Duplex pump is to be placed in the SS. Cuba, of the Merchant Line.

James Fleming, St. John, N.B., has installed a Northey combined air and feed pump.

The Incandescent Electric Light Co., Toronto, are installing a Northey compound plunger pump.

The Dominion Coal Company, Sydney, C.B., are putting a large Northey pump in their mines at that place.

Riordan Paper Mills, Merritton, Ont., will install a Northey triple plunger pump to be run by water power for boiler feeding.

D. Goldie, of Ayr, Ont., has ordered a new Cross Compound Wheelock engine of 350 h.p. from the Goldie & McCulloch Co., Galt.

Messrs. Bowman & Zinkam, Southampton, Ont., have recently installed several Northey pumps, among them a vertical artesian well pump.

The Canada Coal & Railway Co., Joggins' Mines, N.S., will install more pumping machinery, which has been ordered from the Northey Co., Toronto.

Messrs. Bowman & Zinkam, Southampton, Ont., are placing a new 30 h.p. Wheelock engine in their tannery, made by the Goldie & McCulloch Co., Galt, Ont.

Westinghouse, Church, Ker & Co., Boston, Mass., have placed a Northey pump in the refrigerator plant they have just built for F. W. Fearman, of Hamilton, Ont.

Messrs. Hawes and Matchett, St. Thomas, Ont., are placing a new 50 h.p. steel boiler and 40 h.p. Wheelock engine in their factory, both from the Goldie & McCulloch Co., Galt, Ont.

The contract for the ten electric motors which are to operate the locks at the Sault Ste Marie Canal, has been divided between Messrs. Ahern and Soper, Ottawa, representing the Westinghouse Company, and the Canadian General Electric Co'y of Toronto.

The T. Eaton Co., Limited, Toronto, have placed their order with the Goldie & McCulloch Co., Galt, for one of their Wheelock engines of 150 h.p., this being the fifth Wheelock engine ordered from the Galt firm. In addition to this engine they have ordered 80 feet of 4 inch shafting with all ball and socket bearings, friction couplings and pulleys for their new power house now approaching completion.

The woolen mill at Bridgewater, Ont., was destroyed by fire March 31, loss about \$6,000.

Messrs. Gillies & Martin, Teeswater, Ont., have ordered from the Goldie & McCulloch Co., Galt, one of their 30 h.p. Wheelock engines.

Moffatt & Kinch, Peterborough, Ont., have taken over the foundry formerly run by John King & Sons and will run it in connection with their machine shops.

A report made by Mr. George H. Barrus, Boston, to Messrs. Warren Webster & Company, Camden, N.J., with regard to tests made by him at their request upon the Webster steam and oil separators in the power house of the World's Columbian Exposition last October has been published. Two separators were employed in making the tests, one for steam and one for oil, both of the same size and identical in construction. They were attached to one of the duplex steam pumps which supplied water to the Stirling boilers. The results of the steam separator test showed that the separator handled 17½ per cent. of moisture, and within the limit of errors of observation or manipulation, it intercepted the whole quantity that was introduced. The result of the oil separator test was equally satisfactory. One pint of "Capitol" cylinder oil weighing fifteen ounces was introduced into the oil cup, and the whole quantity was discharged into the pump cylinder. Of this there was withdrawn from the separator after drying thirteen ounces, or 86.7 per cent. of the whole quantity. The remainder 13.3 per cent., covered that which disappeared in the process of lubricating the cylinders and working parts, that which clung to the sides of the pipes and the sides and plates in the separator, and that which passed on with the steam and collected in the water of condensation. There was a slight trace of oil on the surface of the water drawn from the condenser, which appeared in the shape of an exceedingly thin film that was barely perceptible. The quantity of steam used was at the rate of 120 pounds per hour. The pump made 53 quadruple strokes per minute, and the oil was used at the rate of from 10 to 14 drops per minute. The time required for emptying the oil cup was two hours. Messrs. Darling Bros., Montreal, are the manufacturers in Canada of this apparatus.

... FOR ALL KINDS OF ...

Electric Supplies and Construction Work

WRITE

Lowe & Farrell, 38 James St. South, Hamilton.

**Second-Hand Engines and Boilers
for Sale by the**

**GOLDIE & McCULLOCH CO., Ltd.
GALT, ONT.**

- 125-h.p. Brown Engine.
- 90-h.p. Wheelock Engine.
- 75-h.p. Slide Valve Engine.
- 60-h.p. Buckeye Engine.
- 50-h.p. Slide Valve Engine.
- 40-h.p. Slide Valve Engine.

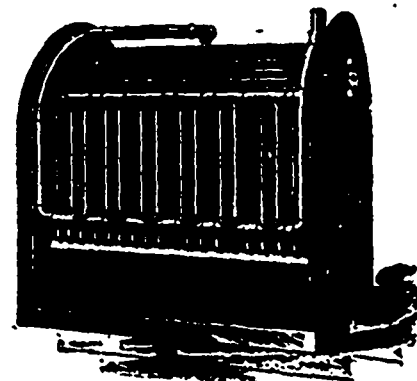
- 35-h.p. Slide Valve Engine.
- 30-h.p. Slide Valve Engine.
- 15-h.p. Slide Valve Engine.
- 100-h.p. Return Tubular Boiler.
- 90-h.p. Return Tubular Boiler.

- 80-h.p. Return Tubular Boiler.
- 70-h.p. Return Tubular Boiler.
- 55-h.p. Return Tubular Boiler.
- 18-h.p. Return Tubular Boiler.

The above Engines and Boilers have been replaced by Wheelock Engines and New Boilers of greater power, and will be rebuilt and sold at very reasonable figures.

For Particulars Apply to

The Goldie & McCulloch Co., Ltd. - Galt, Ont.



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FINLAYSON WATER TUBE MARINE BOILER

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YACHTS, LAUNCHES and OTHER STEAMERS

The most efficient and Reliable Water Tube Boiler in the market. Has entirely new features and improvements. Send for Illustrated Catalogue of Boilers and Engines.

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SWITCHES

For Power and Light Stations.

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.. A NEW ..

Lightning Arrester

-- FOR ALL CIRCUITS --

Price \$15.00.

Discounts on Application.



In the Doane Arrester the short circuit is made through a non-inductive resistance sufficient to limit the current that will follow the lightning discharge to an amount that cannot do any injury.

In a 500 Volt Circuit

With a non-inductive resistance of 100 ohms in series with the arc, only five amperes can follow the discharge; this can do no possible harm, and the arc formed by the passage between the carbons is easily extinguished and without injury to any portion of the circuit.

No current passes through any of the movable parts of this Arrester, and with only a limited current through the carbons, they are practically indestructible.

133 Oliver St., BOSTON, MASS.

Represented in New York City by

The Elson & Brewster Eng'g Co., 141 Liberty St.

The Beamsville, Ont., Electric Light Co., have ordered a new 40 h.p. Wheelock engine and boiler with shafting etc., from the Goldie & McCulloch Co., Galt.

The Waterloo Woolen Mill Co., Waterloo, Ont., have just replaced their Brown engine with a new 100 h.p. Wheelock engine, this being the second Wheelock put in during the last year. The job was done by the Goldie & McCulloch Co., Galt.

The Rathbun Co., Deseronto, Ont., are placing a new 200 h.p. Cross Compound Condensing Wheelock engine in their cement works at their Napanee Mills, and an 80 h.p. Wheelock engine in their Lindsay Mill, both from the Goldie & McCulloch Co., of Galt, Ont.

The Merchants' Manufacturing Co., Montreal, Que., have installed a 1000 gallon Underwriter fire pump in their mill, made for them by the Northey Co., Toronto, who, we are told, are the only firm in Canada making these pumps. They are up to the specifications of, and accepted by, the Associated Mutual Factory Insurance Companies.

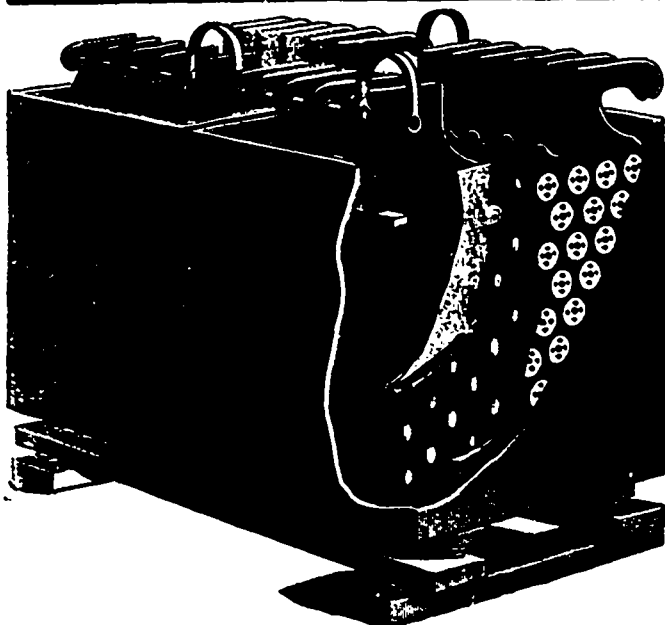
A few days ago the property of the Consolidated Electric Company, of St. John, N. B., including the street railway, was sold for the sum of \$92,000, subject to several liens valued by the Equity Court at \$6,000, and possibly to a lien of \$35,000 held by the Lowell, Mass., Trust Company. It is understood that a syndicate of capitalists, at the head of which is Mr. James Ross, of Montreal, are the purchasers, and that they will, without delay, convert the street road to be operated by electricity, the efficiency of which will be equal to that of the systems in Toronto, Montreal and Ottawa.

The Northey Co., Toronto, have lately supplied fire pumps to the Penman Mfg. Co., Paris, Ont., The Canadian Office and School Furniture Co., Preston, Ont., and Belding, Paul & Co., Montreal.

Mr. L. Simpson, manager of the Montreal Cotton Mills, at Valleyfield, Que., speaking of the industrial prosperity of that town, says that at this time there is not a house to be rented there within a reasonable distance of his mills, although quite a large number were erected last year.

The Electric Installation Company, of Chicago, having applied for information respecting the electric railway franchise, the Finance Committee of the City Council has decided to have prepared a plan of the streets on which it is desired the railway shall run. An offer from the Chicago company is expected shortly. This will be sure to force a fresh one from the London Street Railway Company.—London, Ont., Free Press.

Mr. Robert S. Fraser, Montreal, who has been for the last two years at 465 St. Paul street, that city, has moved to 3 St. Helen street, where he will now carry a full stock of Tetlow's card-clothing in sheets and filleting, made of hardened and tempered steel. Mills can now get the best English card-clothing at once without waiting two or three months for imports. Mr. Fraser has also aprons, plain and grooved, for Barker condenser, oak tanned belting (English), cotton banding and general mill supplies. In addition to the mill supplies Mr. Fraser is agent for the following well known English and Scotch houses:—Sanderson & Murray, Ltd., foreign wools; Thos. Chadwick & Sons, East India, etc.; Thos. Wayman & Co., English pick, lambs', Welsh and Downs wools.



THE CHLORIDE ACCUMULATOR

The Electric Storage Battery Co.

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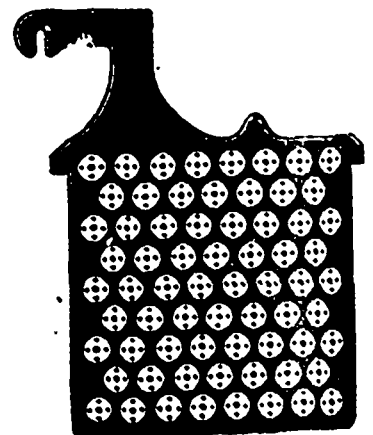
The Chloride Accumulator

Elements of all sizes, from 100
to 10,000 Watts-hours
capacity each.

Traction Cells a Specialty

Electric Launch Equipment, Telegraph
Phonograph, Surgical and all
Special Cells.

Drexel Building - Philadelphia



A saw mill will be erected at Fort Steele, B. C., by Mr. Hanson. The paper mills at Alberin, B. C., will begin operations this month. Humphreys & Trites, Petitecodiac, N. B., are rebuilding their saw mill.

Shaw Bros. are putting a new boiler in their flour mill at Gartmore, Man.

Livingston Bros., Baden, Ont., will put a new boiler in their oil works.

D. Ross, Whitemouth, Man., is placing more machinery in his saw and planing mill.

Robinson & Co., Winnipeg, Man., have sold out their lumber business to Hugh Law.

A 225 h.p. engine has been added to the Hanover Furniture Co.'s factory at Hanover, Ont.

H. M. Couates, Cape Tormentine, N.B., is putting in a Robb Monarch economic boiler in his shoe factory.

Spencer & Tucker, Cape Tormentine, N. B., are placing a Robb Monarch economic boiler in their lobster canning factory.

J. A. Pickett, C. E., of New Glasgow, N. S., has plans for a new waterworks system at Lunenburg, N. S., at an estimated cost of \$70,000.

The Preston Fire Department have secured a 45 ft. extension ladder from the Waterous Co., Brantford. Galt intends to procure one also.—Guelph Herald.

A new industry has started at Victoria, B. C., operated by the British Columbia Bone Co., having for its object the manufacture of bone-dust for fertilizing.

Stock has been subscribed for the proposed carriage works in Palmerston, Ont., to the amount of \$50,000. The works will be exempted from taxation.

A flour mill is being built at St. Henry Mission, Fort Vermillion, Peace River, Athabasca, N. W. T. The machinery arrived at Edmonton a few days ago.

The Morgan Falls Pulp Co., New Germany, N. S., have added three Hughes patent hydraulic pulp grinders, which were built for them by the Robb Engineering Co., Amherst, N. S.

The boot and shoe factory lately carried on by O. L. Richardson & Son, at Levis, Que., has been purchased by Messrs. Campbell, Brodie and Fresque, who are resuming operations under the name of the Standard Boot Co.

Cockburn & Sons will build a saw mill at Cache Bay, Ont.

H. Krug, Berlin, Ont., is making additions to his furniture factory. The town of Aylmer, Ont., will build a complete system of water works.

Regina, N.W.T., will build a new fire hall and purchase a new fire engine.

The Mainland pottery, at New Westminster, B. C., has started operations.

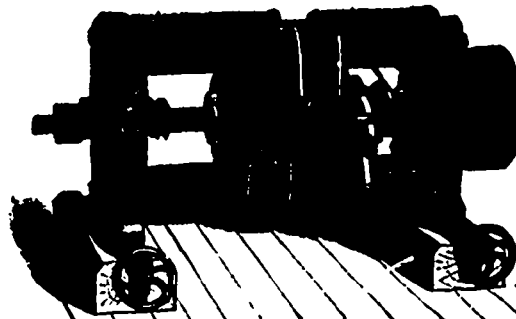
It is reported that a new paper mill is to be built at Campbellford at a cost of about \$350,000.

Sulphite Pulp Co., Chatham, N. B., are making extensive alterations and improvements in their works.

Campbelltown, N. B., will grant ten years' exemption of taxes to the company that will put in a system of waterworks.

The Moose Jaw, N.W.T., electric light plant has been purchased by H. N. Rorison, who will make additions and improvements.

F. A. Olmstead, Sutton, Que., is building a new shingle mill. The machinery and complete outfit was supplied by F. J. Drake, Belleville, Ont.



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MANFG.,
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Manufacturers of The Reliance System of A.C. and Incandescent Lighting

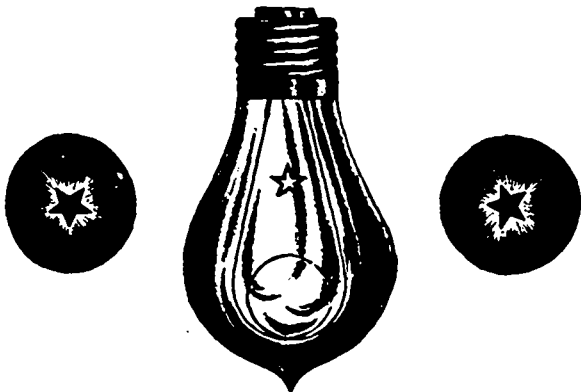
and Power Apparatus. The Itas System of Electric Railway.

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"STARR" Incandescent Lamps . .



Full Candle Power. Long Life. Low Price.

Made of any Candle-Power and Voltage, and with bases to suit the different sockets in use.

Unrivalled Quality. :- High Efficiency.

Write for Quotations, stating Voltage and Base used.

JOHN STARR, SON & CO.
(LIMITED)

... Halifax, N.S. ...

Illustrated Catalogue of Electrical Supplies on Application.

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PACKARD LAMP CO.
(Limited)

:: Of Montreal ::

manufacture an Incandescent Lamp, guaranteed to be equal to anything in the market. It is strictly

.. HIGH GRADE ..

very efficient, and maintains its rated candle power.

Give them a trial and be convinced that, though higher priced,

They are much cheaper in the End . .

Jas. Anderson, Vancouver, B.C., has organized a company with eastern capital, \$100,000, for the purpose of canning, salting, and freezing salmon for export.

The Danville, Que., Slate Co. contemplate running an electric road for freight and passengers from their quarries to Danville station on the G. T. R., a distance of 3½ miles. They now have the quarries lighted by electricity.

A scheme is on foot to construct two dams across the Shubenacadie from Maitland to Black Rock, N. S. Between these two dams will be placed all the machinery necessary for electric plants, factories, etc., of all kinds, which will no doubt not be long in following the completion of the work. Over one dam it is proposed to run cable cars from Truro to Maitland.

Feodor Boas, head of the large knitting mills at St. Hyacinthe, Que., proposes to use the surplus water power controlled by his company in lighting St. Hyacinthe and supplying electric power. Enough power now goes to waste to supply the whole city for years to come, and Mr. Boas has obtained permission to erect poles and lay cables, etc., through the city to carry out his design. Mr. Boas contemplates adding a department for the manufacture of electrical plant and supplies.—Canadian Engineer.

LOOK! LOOK!

**Electric Dynamos and Motors Complete
SECOND-HAND LIST**

- 1-75 light Eddy, 110 Volt Dynamo.
- 1-30 light Jenny, 110 Volt Dynamo.
- 1-3 light 2000 C.P., 9½ ampere Arc Dynamo and Lamp.
- 1-7 H.P. E. Leonard & Sons Slide Valve Engine, used very little.
- 1-4 H.P. Sprague Motor.
- 1-1 H.P. G. & C. 220 Volt Motor.
- 1-6 K.W. Edison 110 Volt Dynamo

Write for Particulars and Prices to

M. D. BARR & CO.,
Successors to ANDERSON, ROBINSON & CO.,
56½ KING STREET EAST, TORONTO, ONT.

We can supply full lines of Railway or Lighting Material on short notice.

John Carew, Lindsay, Ont., has just erected a lath mill, the machinery supplied by F. J. Drake, of Belleville, which cuts 40,000 to 50,000 lath per day.

The Moodyville Mill Co., Moodyville, B. C., are calling for tenders for the construction of a logging railway three miles in length, at Grief Point, Malaspina Straits.

Information has been received by the Ontario Bureau of Mines that tin ore has been discovered in the vicinity of Sudbury, but it is not stated in what quantities the ore is present. If it proves to be of a sufficient extent to allow of its being profitably worked, the importance of the discovery will be far reaching.

A Well Known Textile Expert.



MR. C. E. W. DOW.
labor saving devices and secrets of the trade.
This gentleman affords a good example also of what can be accom-

The cotton mill men of Canada, especially the officers of mills and superintendents, will be pleased to know that they may hope to soon receive a visit from Mr. Charles E. W. Dow, one of the best all round practical experts in cotton mill matters. While thoroughly informed in the science and theory of cotton manufacture, Mr. Dow has had long experience in every department of mill work, even to making special tools and machines, and designing factory buildings and their paraphernalia. He is intimately acquainted with all the great mills of the North, familiar with their processes, and thoroughly informed as to the latest improvements in cotton machinery and new or

**THE PETERBOROUGH
CARBON & PORCELAIN CO.
LIMITED**

MANUFACTURERS OF

**Carbon Points for All
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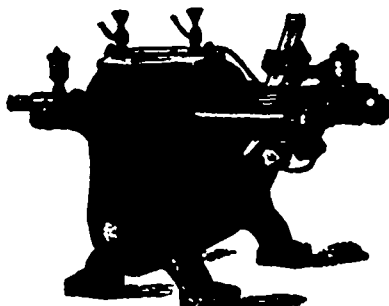
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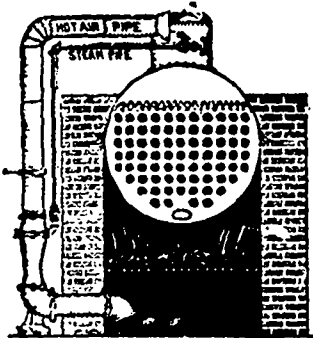
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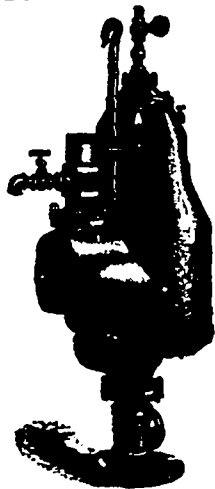
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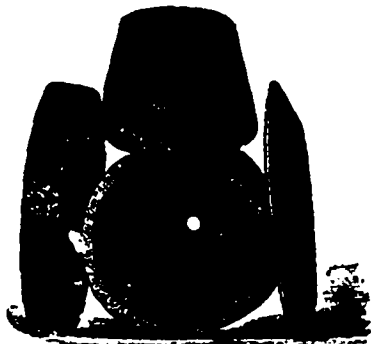
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plished by a mill hand who is determined to get ahead. Born at Manchester, N.H., in the very heart of successful cotton manufacture, he went into the cotton mills there at an early age, and as a boy was employed in nearly every branch of manufacture. In 1880 he took up mechanical drawing in the night schools of that city, and was soon after employed as draftsman by the Amoskeag Manufacturing Company, one of the largest cotton spinning corporations in the world. 1883 Mr. Dow was employed by the Lane Mills of New Orleans, La., first as carder and later as machinist. Upon returning North, he was in the employ successively of George Draper & Sons, the Flynt Building and Construction Co., and the Brown & Sharpe Manufacturing Company of Providence, R. I. With the latter concern Mr. Dow remained some five years, at the time of leaving them being chief draftsman. Since that time he has been in the service of Frank Sheldon, the well known mill engineer, and of the Hotchkiss Ordnance Company. In the latter employ Mr. Dow was mechanical engineer and designed tools used in building the Howell torpedoes, as well as many of the torpedo fittings used in the equipment of the new United States navy.

Shortly after the organization of the Metallic Drawing Roll Co., Mr. Dow was secured as its superintendent, and a good share of the success of that concern was due to his efforts. The company's increasing business requiring that his undivided attention be given to introducing its patent metallic rolls, Mr. Dow was this spring made agent. While his tour is primarily in that capacity, none of our manufacturers can fail to be benefited by a visit from one of his wide acquaintance, expert knowledge and large experience. Any cotton mill wishing to be favored with a call from him can reach him by addressing him in care of the Canadian Manufacturer, Toronto.

The merits of the patent metallic roll are now universally recognized. It has become famous as the greatest improvement in cotton

spinning since Arkwright's time. The metallic roll is running in a large number of American mills, with such eminent success that several new mills are being equipped with it throughout, notably the Columbia and Pacolet Mills, in S. C. and the Lanett, in Georgia.

CANADIAN PATENTS.

The following patents have been issued from the Canadian Patent Office, from February 1 to February 14, 1894, inclusive.

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

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A. Harvey,	Central Chambers,	Ottawa.
J. A. Grenier,	Imperial Building,	Montreal.

Copies of American patents corresponding to Canadian patents can be procured from these attorneys for the sum of twenty-five cents each.

45,200 Snow plough, Daniel Jacobs, Kansas, U.S.A. February 1.

45,201 Vice, David C. Sabourin and Joseph Sabourin, Lowell, Mass. February 1.

45,202 Method of sealing vessels, Alfred Louis Weissenthamer, Paris, France, February 1.

45,203 Method of and machine for forming spool blanks, Charles A. Broughton, Conway, N.H., February 1.

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- 45,204 Electric conductor system for railways, George W. Von Siemens, Berlin, Prussia., February 1.
- 45,205 Apparatus for maintaining electric current, John Stephen Monahan and Arthur Septimus Thompson, Toronto, Ont., February 1.
- 45,206 Try square, James Eugene Duncan, Centralia, Wis., February 1.
- 45,207 Michael Joseph Wolfe and Joseph Hamilton Epton, Hamilton, Ont., February 1.
- 45,208 August Krang, Cleveland, Ohio, February 1.
- 45,209 Car coupler, John Jacob Schairer, Clint, Texas, February 1.
- 45,210 Shoe for hooped animals, The Mail Horse-shoe syndicate, assignee of Mary Emily Poupard, London, Eng., February 1.
- 45,211 Shoe for hooped animals, The Mail Horse-shoe syndicate, assignee of Mary Emily Poupard, London, Eng., February 1.
- 45,212 Fastener for tires the Pneumatic Tire and Cycle Co., assignee of Alfred Coningsby, Brooklyn, N. Y., February 2.
- 45,213 Carpet stretcher and tacker, John H. Nicholls, Fletcher Barton and Isaac L. Barton, Davenport, assignees of George W. Ansley, Medical Lake, Washington, February 2.
- 45,214 Typewriter, the Liberty Mfg Co., assignee of James E. Wilson, New York, N.Y., February 2.
- 45,215 Process of ornamenting paper, the E.B. Eddy Co., Hull, Que., assignee of Seth Wheeler, Albany, N.Y., February 2.
- 45,216 Process of ornamenting paper, the E.B. Eddy Co., Hull, Que., assignee of Seth Wheeler, Albany, N.Y., February 2.
- 45,217 Process of ornamenting paper, the E.B. Eddy Co. Hull, Que., assignee of Seth Wheeler, Albany, N.Y., February 2.
- 45,218 Machine for ornamenting paper, the E.B. Eddy Co. Hull, Que., assignee of Seth Wheeler, Albany, N.Y., February 2.
- 45,219 Ornamented paper, the E.B. Eddy Co., Hull, Que, assignee of Seth Wheeler, Albany, N.Y., February 2.
- 45,220 Artificial arm and hand, Thence Sparkham and James Hall, Brockville, Ont., February 2.
- 45,221 Apparatus for refining acetic acid, Stanley Cooper Peuchen and Peter Clarke, Toronto, Ont., February 2.
- 45,222 Process of and apparatus for concentrating or vapourizing sulphuric and acetic acids, Stanley Cooper Peuchen and Peter Clarke, Toronto, Ont., February 2.

- 45,223 Explosive, William Adams, jr., assignee of Francis J. Spence, Broken Hill, New South Wales, Australia, February 2.
- 45,224 Method of and apparatus for boring under water, Charles H. Tompkins, assignee of Alfred William Palmer. New York, N.Y., February 2.
- 45,225 Electric meter, James A. Pentz, Philadelphia, Pa., assignee of Anthony Reckenzann, London, Eng., February 2.
- 45,226 Car stake, Peter Anderson and Samuel W. Pierson, Prentive, Wis., February 2.
- 45,227 Car coupler, Daniel K. Slawson, Manitou, Manitoba, Feb. 3.
- 45,228 Stamp mill and amalgamator, Charles Carter and Alfred Henry Bell, Itapah, Utah, February 2.
- 45,229 Sewing machine, Harry Moore, Wellingborough, Northampton, Eng., February 3.
- 45,230 Screen for doorways, Alexander Drummond, Evanston, Ill., February 3.
- 45,231 Feed box, Thomas Lewis, Townsend, New York, N. Y., February 3.

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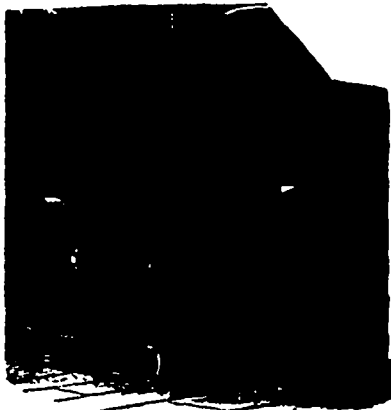
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- 45,232 Combined washer and nut lock, Charles H. Foote, Kansas City, Kansas, February 5.
- 45,233 Journal box, William Sneddon, Houston, Texas, February 5.
- 45,234 Ore separator, Clinton M. Ball, Troy, N.Y., and Sheldon Norton, Hokendauqua, Pa., February 5.
- 45,235 Method of making knitted garments, August Clauss, Hohenstein, Ernstthal, Saxony, German Empire, February 5.
- 45,236 Runner for vehicles, Gideon Madeau, Marinette, Wis., February 5.
- 45,237 Tire tightener, William Henry Kirby and John Plews, Vancouver, B.C., February 5.
- 45,238 Machine for making barrels and casks, the Campbell Barrel Machine Co. assignee of Henry Campbell, Baltimore, Md., February 5.
- 45,239 Excavating and conveying machine, Daniel Irving Calhoun, Chicago, Ill., February 5.
- 45,240 Tire for vehicle wheels, Robert Scott Anderson, Toronto, Ont., February 5.
- 45,241 Spring for carriage tops, Daniel Conboy, Toronto, Ont., February 5.
- 45,242 Hoisting device, Henry Hagelstein, San Angelo, Texas, February 5.
- 45,243 Two-wheeled vehicle, Fred Paul, Grosscup, Charleston, W. Virginia, February 5.
- 45,244 Engine stroke reducer, James Wright, Montreal, Que., February 5.
- 45,245 Machine for making clothes pins, Alexander Read, Buffalo, N.Y., February 5.
- 45,246 Cinder sifter, Adoniram Henderson, Toronto, Ont., February 5.
- 45,247 Process of and apparatus for the production of dough from cereals, Ferdinand I. Gelinck, Riga, Russia, February 5.
- 45,248 Apparatus for making cheese, Robert T. Beckett, Kemptville, Ont., February 5.
- 45,249 Support for school furniture, Thomas Russel Roulstone, Somerville, Mass., February 5.

- 45,250 Pulverizing machine, John James Bordman, Brooklyn, N.Y., February 5.
- 45,251 Pulverizing machine, John James Bordman, Brooklyn, N.Y., February 5.
- 45,252 Machine for making cable chains, Frederick Egge, Bridgeport, Conn., February 5.
- 45,253 Machine for making shingles, A. Bertsell Ireland, Greene, N.Y., February 6.
- 45,254 Barrel truck and stand combined, Julius Fillman, Oakwood, Ohio, February 6.
- 45,255 Cravat holder, Johan Papiesz, 199 Linienstrasse, Berlin, Germany, February 6.
- 45,256 Baby carriage, William Alfred Marqua, Cincinnati, Ohio, February 6.
- 45,257 Coupling for fire hose, Orville Russell Tackett and John Pfetsch, Niagara Falls, N.Y., February 6.
- 45,258 Method of making barrels, casks, firkins, etc, the Campbell Barrel Mch. Co., assignee of Henry Campbell, Baltimore, Md., February 5.
- 45,259 Milk cooler, Frank Miller and John Henry Cox, Belleville, Ont., February 6.
- 45,260 Car coupler, David George Cross and John Richard Eden, Berlin, Ont., February 6.
- 45,261 Eraser for blackboards, John George Walters and Benjamin S. Hallman, Berlin, Ont., February 6.
- 45,262 Pointer for blackboards and maps, John George Walters and Benjamin S. Hallman, Berlin, Ont., February 6.

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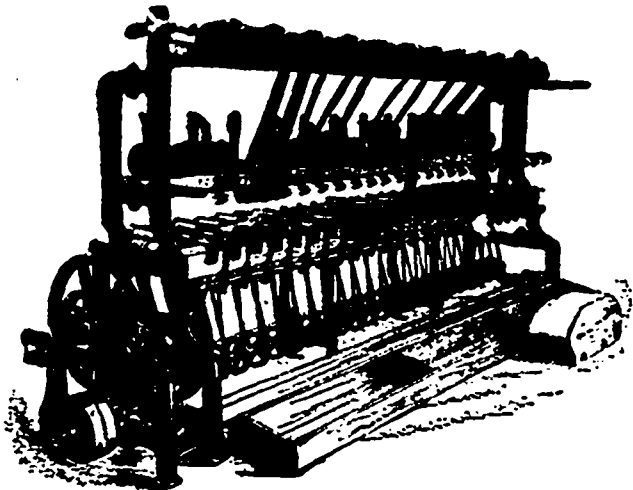
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- 45,263 Lounge for railway carriages, Leopold Glaser and Adalbert T. Kiviakowski, Posen, Prussia, German Empire, February 6.
- 45,264 Rotary plough, Lafayette D. Railstach, Indianapolis, Ind., February 6.
- 45,265 Pin lock, John V. Smith, Hayes, Ill., February 6.
- 45,266 Method of finishing the surfaces of wood and like material, Victor Victorson, Boston, Mass., February 8.
- 45,267 Door hanger, The Cronk Hanger Co., assignees of William Cronk, Havana, N. Y., February 8.
- 45,268 Governor for steam engines, Julius Begtrup and James McEwan, Ridgeway, Pa., February 8.
- 45,269 Soap, Annie G. Crawford, New Glasgow, N.S., February 8.
- 45,270 Signal for railways, William J. Butler, Woodstock, Ont., February 8.
- 45,271 Utilization of liquors containing sulphate of alumina or ferric sulphate for making manures, Lebrecht Tralls, Dux, Bohemia, Austria, February 8.
- 45,272 Trunk tray, Edward Josiah Cummings, Quincy, Mass., February 8.
- 45,273 Dice caster, John Reese Rowlands, Syracuse, N.Y., February 8.
- 45,274 Cup and base piece combined, Harvey R. T. Coffin, Glen Falls, N.Y., February 8.
- 45,275 Fence, William John Johnston, Port Huron, Mich., February 8.
- 45,276 Indicator for steam boats, Spencer Dervees Thurston, Camden, N. J., February 8.
- 45,277 Wrench, Frederick Sandford Seymour, Lake Geneva, Wis., February 8.
- 45,278 Hold-back bracket, James Houghton, Brantford, Ont., February 8.

- 45,279 Lamp or oil stove, Charles L. Campbell, Campbellton, N.S. and Charles R. Hoben, St. John, N.B., February 8.
- 45,280 Fluid meats, and the process of manufacturing same, William Clark, Montreal, Que., February 8.
- 45,281 Manufacture of artificial stone, Ofere Lablanc, Montreal, Que., February 9.
- 45,282 Dasher for churns, James Edwin Gibbs and John W. Wetter, Chattanooga, Tenn., February 9.
- 45,283 Water elevator, Paul Sattelkan and Herman Reinhard Winkelmann, Philadelphia, Pa., February 9.
- 45,284 Galvanic battery, Harry T. Johnson, N. Y., February 9.
- 45,285 Ship, Richard B. Painter and William G. Elliott, Williamsport, Pa., February 9.
- 45,286 Brake for railroad cars, Ogden W. Dean, Chicago, Ill., February 9.
- 45,287 Cash register, William H. Thompson, East Stroudsburgh, Pa., February 9.

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- 45,288 Process of making mosaics, Honore B. Allays, Frenchtown, Montana, February 9.
- 45,289 Oil can, Charles P. Parish & Co., assignee of Charles H. Phelps, Chicago, Ill., February 9.
- 45,290 Manufacture of artificial fuel, Robert F. Strong and Alexander Gordon, London, Eng., February 9.
- 45,291 Wrench, Jerry Foley, Syracuse, N. Y., February 9.
- 45,292 Can, Thomas Charles Davidson, Montreal, Que., February 9.
- 45,293 Mucilage, etc., Charles M. Higgins, Brooklyn, N. Y., February 9.
- 45,294 Horse collar, Edmund Henry Gullede, Oakville, Ont., February 9.
- 45,295 Knapsack, Henry C. Merriam, Fort Logan, Colorado, February 9.
- 45,296 Brake-shoe, William Wirt Whitcomb, Boston, Mass., February 10.
- 45,297 Brake-shoe, William Wirt Whitcomb, Boston, Mass., February 10.
- 45,298 Machine for waxing leather; Eugene Guay St. Henry, Montreal, Que., February 10.
- 45,299 Pedal for bicycles, Charles Herman Metz, Waltham, and Walter Measure, Highlandville, Mass., February 10.
- 45,300 Rail joint, Charles T. Stagg, jr., Philadelphia, Pa., February 10.
- 45,301 Nut lock, Ira Nappin, Farmington, Ill., February 10.
- 45,302 Buckle and snap hook, Gunther Fridrich Carl Schroter, Redding, Cal., February 10.
- 45,303 Fastener for collars, Charles Everitt, Oshkosh, Wisconsin, February 10.
- 45,304 Bracket for shingling purposes, John B. Kension and Michael F. Burke, Lynn, Mass., February 12.
- 45,305 Fastener and slide for windows, William Bentley, Lethbridge, N.W.T., February 12.
- 45,306 Means for supporting and adjusting window blinds, William H. Nesbitt, Blenheim Gardens, Wilsden Green, Middlesex, Eng., February 12.
- 45,307 Clothes drier, Valentine Reichert, Waterloo, Ont., February 12.
- 45,308 Mechanical movement, Timothy C. Van Wyck, Brooklyn, N. Y., February 12.

- 45,309 Soda fountain and ice cream cooler combined, Frank W. Merrill, Deering, Maine, February 12.
- 45,310 Brick mould, Charles A. Schultz, Rondout, N. Y., February 12.
- 45,311 Nut lock and shaft coupling, Edwin Stancliff, New York, N. Y., February 13.
- 45,312 Clasp, Charles La Dow, Albany, N. Y., February 13.
- 45,313 Manual recorder and cash drawer, Harry M. Geiger and Daniel E. Corbitt, Grand Rapids, Mich., February 13.
- 45,314 Car fender, Louis Pfingst, Boston, Mass., February 13.
- 45,315 Water heater, William S. Reed, Marshalltown, Iowa, February 13.
- 45,316 Water-tube boiler, Montague H. C. Shaun, Brisbane, Queensland, Australia.
- 45,317 Telautograph, Elisha Gray, Highland Park, Ill., February 13.
- 45,318 System of telautography, Elisha Gray, Highland Park, Ill., February 13.
- 45,319 Telautograph, Elisha Gray, Highland Park, Ill., February 13.
- 45,320 Telautograph, Elisha Gray, Highland Park, Ill., February 13.

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- 45,321 Art of telegraphy, Elisha Gray, Highland Park, Ill., February 13.
- 45,322 Eave trough coupler, John Milton Davidson, Allegheny, Pa., February 13.
- 45,323 Folding crate, Samuel Ison Butters and Granville Bartlett, Clarksbury, West Virginia, February 14.
- 45,324 Wire coiler, The Dominion Wire Mfg. Co., Montreal, Que., assignee of Clarence Otis White and Marshall Burns Lloyd, Minneapolis, Minn., February 14.

UNITED STATES PATENTS.

GRANTED TO CANADIAN INVENTORS.

The following patents were issued from the United States Patent Office, on April 3 and April 10, 1894, and reported especially for the CANADIAN MANUFACTURER by Glascock & Co., patent attorneys, Washington, D. C. Printed copies of these patents can be obtained from them for 25 cents each.

Jean F. Chazotte, Montreal, assignor of two-thirds to Gustave des

Trois Maisons, and Antoine Roy, same place, smoke consuming furnace.

William J. Still, Toronto, assignor of one-half to Randolph MacDonald, same place, electric motor. Two patents.

Richard H. Casswell, Ingersoll, assignor to Charles H. Slawson and Stephen King, same place, and John S. Pearce, London, Canada, milk purifier.

William McCloskey, Essex, assignor of one-half to Alem J. Green, same place, harvester. Two patents.

Alexander Marcy, Toronto, assignor of eleven-twentieths to Joseph Hanauer, Omaha, Neb., transposing keyboard.

George Hay, Picton, chalk sharpener.

William Hull, Souris, combined drag-bar cultivator and drill.

Thomas J. McBride, Winnipeg, Manitoba, assignor to the Massey-Harris Co. Toronto, cultivator.

Ernest A. Le Sueur, Ottawa, electrolytic cell.

Charles G. Richardson, Toronto, refining nickel and copper mattes.

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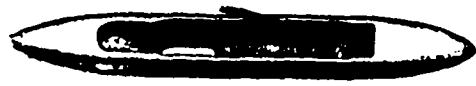
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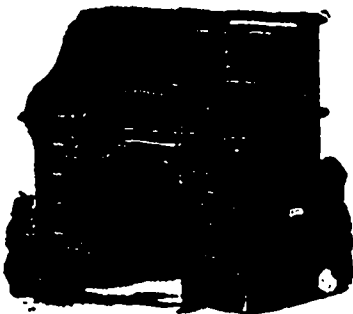
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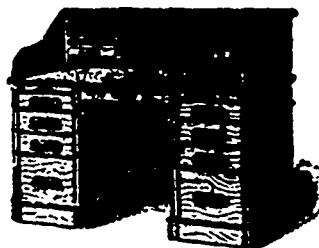
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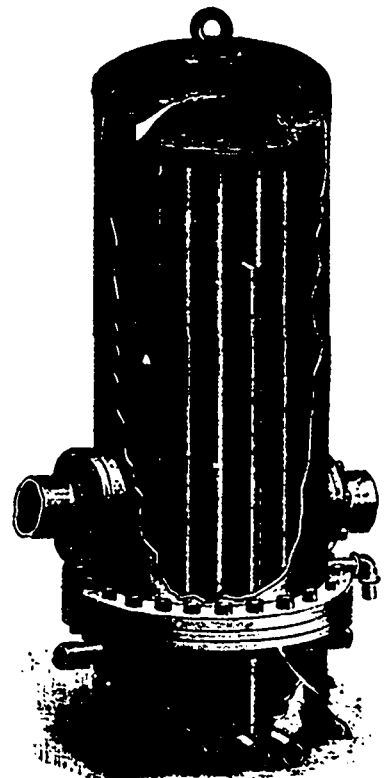
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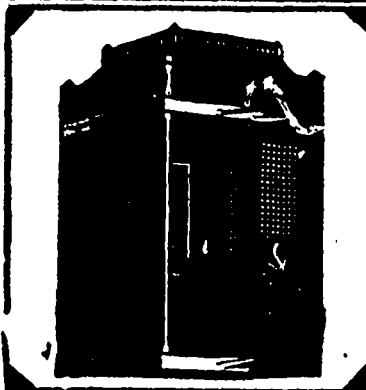
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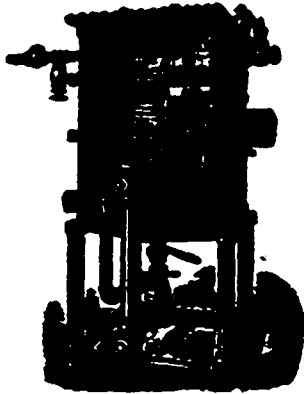
St. Clair Tunnel Co.	•	10,000 Barrels
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Edison General Electric Co.	•	2,000 "
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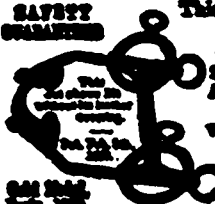
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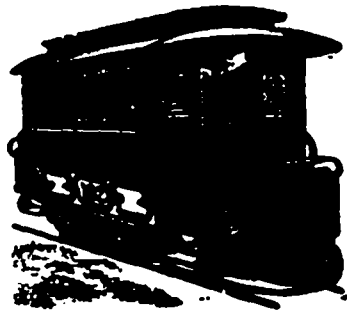
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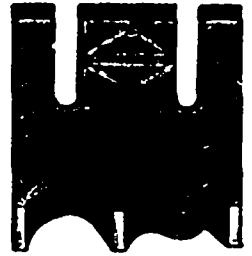
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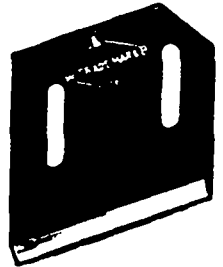
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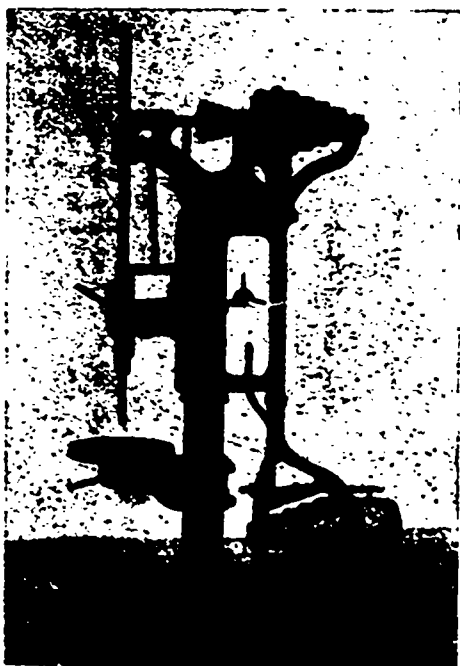
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RESULTS FOR 1893

New Business Issued . . . \$2,490,210
(Increase over 1892) . . . \$407,900
Assets 31st December, 1893 - \$673,738
(Increase over 1892) . . . \$137,671

Gross Cash Income . . . \$287,340
(Increase over 1892) . . . \$45,525
Surplus on Policyholders' acct. \$104,598
(Increase over 1892) . . . \$30,922

Insurance in Force 31st December, 1893, - - \$8,937,834

GEORGE GOODERHAM,
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Manufacturers of Salt Glazed Verified Sewer Pipes, Double Strength Heavy
Subvert Pipes, Turbines, Tubs, and all kinds of Fire Clay Goods.
The Standard Drain Pipe Co., of St. John's, P.Q., (L.M.) W. C. THORPE, President

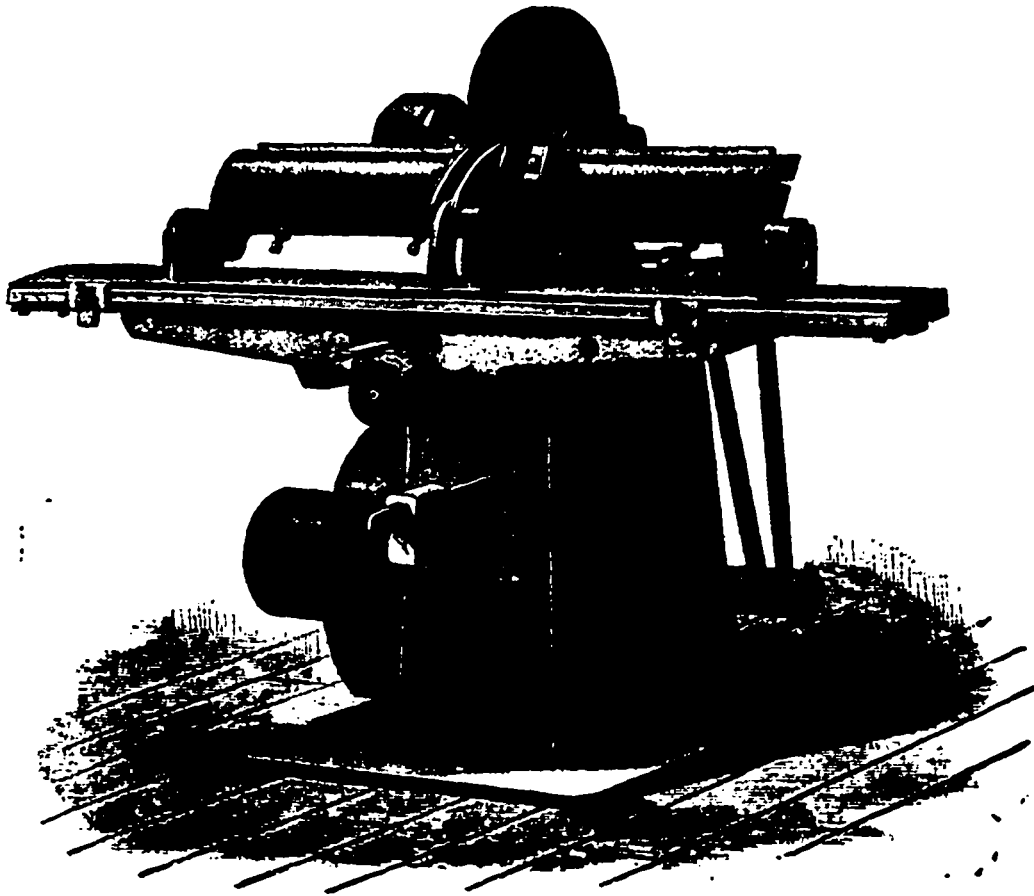
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For Hard Wear, Strength and Durability they are Simply
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Though "Extra Strong" they are not heavy to handle.

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Improved Automatic

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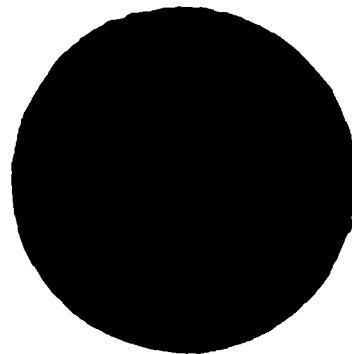
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To secure by all legitimate means the aid of both Public Opinion and Governmental Policy in favor of the development of home industry and the promotion of Canadian manufacturing enterprises.

To enable those in all branches of manufacturing enterprises to act in concert as a united body whenever action in behalf of any particular industry, or of the whole body, is necessary.

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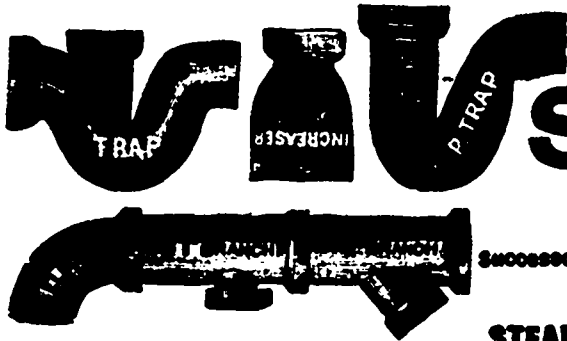
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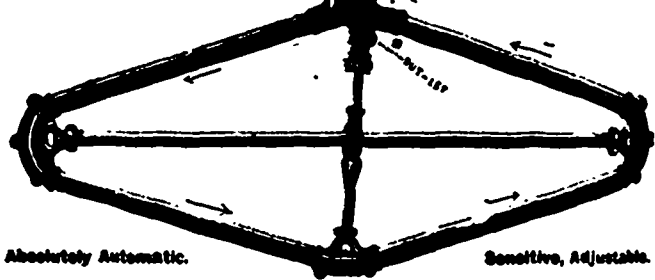
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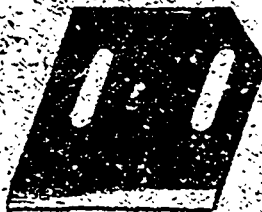
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