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

Vol. 15.

TORONTO, DECEMBER 21, 1888.

No. 12.

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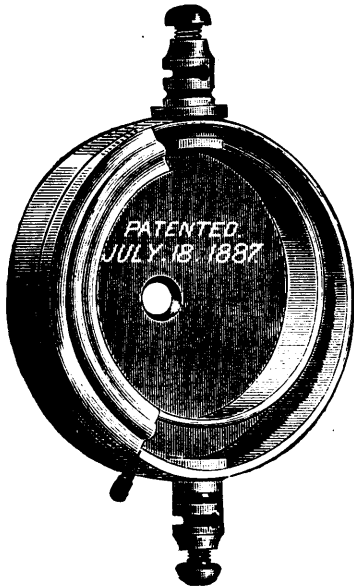
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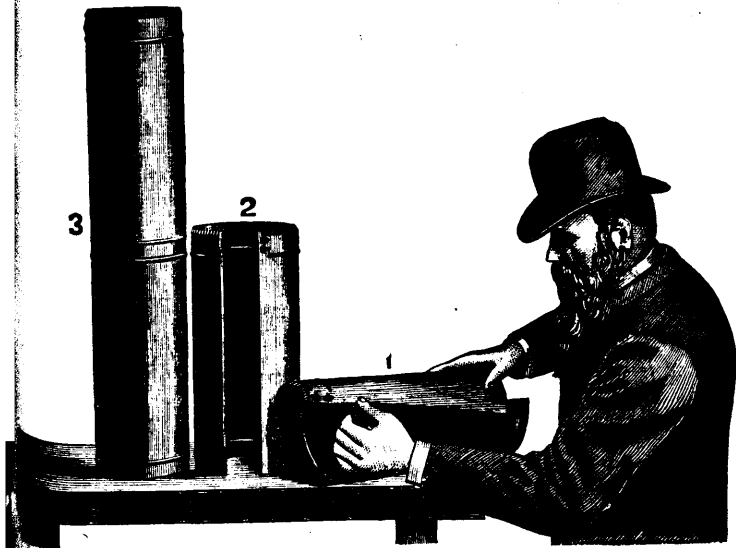
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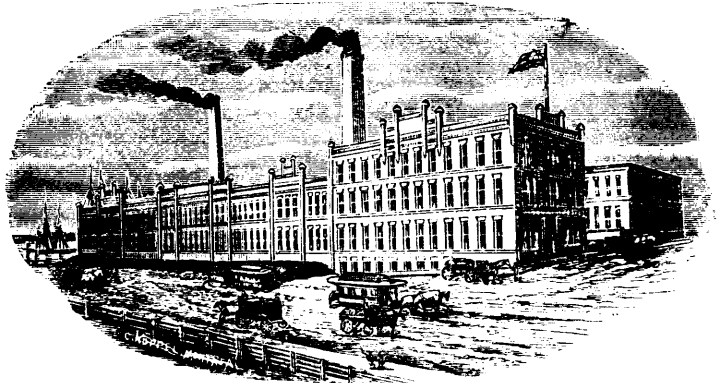
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PRISON LABOR VS. FREE LABOR.

THE *Globe*, in an editorial on "Prison Labor," speaking of the new law in New York forbidding convicts to work except in making articles required in the penal institutions of that State, says that it will cost the State \$400,000 more to keep its prisoners this year than last—that the law condemns 3,440 rascals to idleness where they used to be made to earn their livings in prisons; that under the new system the health of the convicts is being impaired by the enforced idleness, and that "probably the trades with which prison labor comes chiefly in competition are injured more by having to maintain prisoners in idleness than they are by the competition of their labor." No doubt prison wardens would like to have their penitentiaries self-sustaining; and from a certain standpoint it may be desirable thus to have them; but for many long years, and until quite recently, the element of convict-made goods as in competition in the open market with free-made goods, created a condition of affairs exceedingly inimical not only to free labor, but also to the employers of free labor in the particular industries in which the convicts were employed. This was the fact particularly noticeable in the stove-moulding trade in and near Albany, where hundreds of convicts were employed under contract by certain stove manufacturers, to the detriment and disorganization of the business generally, and which contributed largely to the development of that antagonism on the part of labor organizations which resulted in the enactment of the present law. It was urged by those in favor of employing convicts in those industries which would afford the greatest money returns to the State, that the several hundred convicts employed in the business should be considered in the light of just so many workmen employed in that particular industry; but while there are thousands of free stove moulders employed

in the business in New York, the convict labor competition was most keenly felt. The convicts were never out of a job, but the free men were frequently laid off, and while the employers of convict labor were steadily becoming richer and richer, the outside manufacturers frequently faced the problem whether it would not be better for them to permanently close their works, invest their money in other industries, and allow their free workmen to obtain other jobs as best they could.

A difference between humanitarians of the *Globe* type and those who take a more practical view of the situation is, that with the one the present and hereafter interests of convicts are of paramount importance, while with the other the first care is bestowed upon the welfare and happiness of free men upon whom wives and children depend for support, the comfort and convenience of convicts being of but secondary importance. According to the *Globe*, under the new system the convicts complain that they are kept in enforced idleness; and certain humanitarians complain that they are not self-sustaining. The answers to these objections are, that the manufacture of articles required in the penal institutions of the States involves a certain amount of the labor of the convicts, and that the time in which they are not thus employed might just as well be devoted to instructing them in other than mechanical industries. Thus, it might be well to organize the unfortunates into classes with suitable professors, and teach them law, medicine, surgery and divinity, so that when they had performed their allotted service to the State, when they are discharged and turned loose upon the community, they would be in a condition, as far as education goes, to become lawyers, doctors, surgeons and clericals. It might be said that all these classes require a higher order of intellect for proficient than do the mechanical trades, but this is an open question. The increase by a few thousand to the roster of professional gentlemen would be a small matter compared with the unbalancing of mechanical industries and the consequent suffering of helpless women and children.

The *Globe* says: "The absurdity of the dread of the competition of prison labor is seen when it is pointed out that the proportion of long-term criminals to the population is not more than one in a thousand." There was no explanatory diagram accompanying this astute statement. Free laboring men are not as deeply concerned as to whether the terms of convicts are "long" or "short," as they are as to the competition against which the *Globe* wants them to contend. The salient fact, as shown by the *Globe*, is that there are nearly four thousand convicts in the penal institutions of New York, who are now prevented by law from competing in the mechanical industries with free labor, but who the humanitarians desire should be employed in such industries. The dread of this competition may be "absurd," but it is a tangible possibility against which both free labor and the employers of free labor stand shoulder to shoulder to oppose and prevent.

INDUSTRIAL EDUCATION.

In our last issue we published a circular letter issued by Hon. George W. Ross, Minister of Education of Ontario, to a number of manufacturers, skilled mechanics and others, inviting them to meet him on the 19th instant at his office, for con-

sultation and an expression of views regarding the introduction by the Ontario Government of a system of industrial education by the establishing in the School of Practical Science, full courses of instruction in applied chemistry, applied mechanics and architecture. It was stated that the attention of the meeting would be mainly directed: (1) To a consideration of the various kinds of skilled labor now required to carry on the industries of the country, and the best means of rendering it more productive and therefore more valuable; (2) to a consideration of what courses of instruction would be necessary to provide such skilled labor at home as is now supplied from abroad, and (3) to enquire what industries, if any, not yet established in Ontario, could be made productive provided the Government could supply them with skilled labor.

Growing out of this invitation an important conference of those interested in marine engineering was held in the assembly room of the Canadian Manufacturers' Association in this city, adjoining the offices of the CANADIAN MANUFACTURER, on December 13th, for the purpose of formulating some plan or suggestions to be made to the Minister. Among those present were Messrs. S. S. Malcolmson, chairman Marine Engineering Society; W. Polson, W. J. Allan, J. Galt, John Ingalls, John Abell, A. Wickens, W. J. Meneilly, and by invitation, Professors Galbraith and Ellis. Mr. W. Polson was elected chairman, and Mr. W. J. Allan, Secretary. The whole question of practical science teaching, especially as it effected marine engineering, was very carefully and thoroughly discussed. Credit was given to the present School of Civil Engineering, which already had about 60 scholars, although the school was not equipped to go beyond theoretical teaching. Professor Galbraith gave a short account of his visit of inspection to the technical schools of the United States. He also had a plan to complete such an institution as was contemplated at a cost from \$12,000 to \$15,000. It was pointed out by some of those present that taxes had to be paid to train men for divinity, medicine and law; and it was equally important men should be trained so that the highest class of workmanship should prevail in every industry. It was also shown that night schools would be necessary to meet the case of men who could not attend through the day. It was suggested that the City Council be approached through the Mayor and asked to aid in that department, which was within the province of the municipality to deal with. It was shown that at present it was necessary for Canadians desiring sound, practical scientific training to go to the United States schools. Many who had done so were holding situations in the States, and it was argued that Canada should be put in a position to teach her own sons in this particular way. Eventually the following resolution was passed, proposed by Mr. John Galt, seconded by Mr. John Abell:—"That this meeting is unanimously of opinion that it is highly important and desirable to establish a school of practical science on a complete, thorough, and technical basis, to include the teaching of science as applied to industrial pursuits."

FACTORY FIRE ESCAPES.

THE loss of forty-four human lives in Rochester, N. Y. in November, in the destruction by fire of the Steam Gauge and Lantern Works, has been investigated by a factory inspector of that

State, the development showing that there were two fire escapes on the building, and that while they possibly complied with the letter of the law requiring them, they were not in accordance with the recommendations made by the factory inspector, who had frequently urged that they be made more easily accessible. They were deficient in that they were perpendicular; without balconies at the different floors, and that the shutters opened against them so that they were invisible and practically useless to the people within the building. Regarding these "escapes" the inspector expressed the opinion that even with balconies, perpendicular ladders are not proper or efficient fire escapes. Outside iron stairways should be placed in all factories of three or more stories. If balconies and inclined ladders are used, the ladders should incline at least twenty degrees and be provided with handrails, and ought not to pass in front of a window; and balconies should be accessible from not less than two windows each.

The New York inspector says that sixty per cent. of the manufacturing done in that State is in rented buildings, the tenants of which will not go to the expense of erecting suitable fire escapes if they can avoid it, seeing it would be making improvements on the property of others; while landlords will not spend money for such a purpose unless forced to do so by something stronger than the requests of tenants or public opinion. It does not seem that either landlords or tenants attach sufficient importance to the value of the lives of the swarms of human beings who work in these death traps.

A USEFUL ORGANIZATION.

DURING the ten months preceding the presidential election in the United States, in November last, the American Iron and Steel Association, of which Mr. James M. Swank is general manager, distributed 1,387,864 tariff tracts in that country in different localities where it was believed they would do the most good. These tracts were not scattered about promiscuously, but were placed in the hands of persons who made it their business to see that they were not wasted or destroyed; and only such tracts were sent to the distributors as were specially adapted to the enlightenment on the different phases of the tariff question of those into whose hands they were to be placed.

The first general meeting of the iron trade of the United States was held in Philadelphia, December 20th, 1849, its object being "to consider the existing depression in the iron industry, and to appeal to Congress for relief through a revision of the tariff." A general committee was appointed to further the purposes of the convention, and its adjournment was *sine die*.

There was no other important movement on the part of American iron manufacturers, looking to organization, until the formation of the American Iron Association in Philadelphia, on March 6th, 1855. The first article of the constitution of the Association was as follows:

"The general objects of this Association shall be to procure, regularly, the statistics of the trade both at home and abroad; to provide for the mutual interchange of information and experience, both scientific and practical; to collect and preserve all works relating to iron and steel, and to form a complete cabinet of ores, limestones and coals; to encourage the forma-

tion of such schools as are designed to give the young iron-master a proper and thorough scientific training, preparatory to engaging in practical operations; and, generally, to take all proper measures for advancing the interests of the trade in all its branches."

This Association was in active existence four years.

In October, 1864, a number of iron manufacturers from various States issued an invitation to all the iron and steel makers of the United States to meet in Philadelphia for the consideration of a plan of organization "whereby the whole American iron interest might be promoted, and each branch known and cared for." On this invitation there was a large and general attendance in Philadelphia, November 16th, 1864, which resulted in the organization of the American Iron and Steel Association. This Association has ever since maintained a healthy and active existence. The first article of the constitution adopted was verbatim as that which had been adopted by the American Iron Association in 1855, which is here reproduced. The first president of the American Iron and Steel Association was Captain E. B. Ward, who continued to occupy this position until 1869, when he declined a re-election, remaining, however, an active member and manager until his death in January, 1875. Mr. Swank says of Captain Ward that "he was born in Canada, on Christmas, 1811, his parents being American citizens who had emigrated from Vermont." Hon. Abram S. Hewett, one of the best known iron manufacturers in the United States, was elected one of the original vice-presidents of the Association, and has held that position continuously ever since. The Association has experienced very few changes in its officers and employes since its organization. It has had only four presidents, and Mr. Swank, the present secretary and manager, has had charge of the office work of the Association for sixteen years.

The American Iron and Steel Association is a recognized authority in all matters relating to the manufacture of iron and steel, except scientific and technical details, and it is consulted by Congressmen and Government officials at home, and by persons in all countries who desire accurate information concerning American iron and steel industries. Its work is divided into six branches, as follows: 1st. Statistical, which takes shape in an annual report and in various other forms. 2nd. The frequent revision and publication of a directory to all the iron and steel works in the United States. 3rd. The publication and wide distribution of the *Bulletin*, a weekly newspaper. 4th. Special work, such as constant attention to tariff legislation and decisions by the Treasury Department upon questions affecting the interests of the iron trade. 5th. Educational work, embracing the publication and distribution of tariff tracts and other tariff documents. 6th. The maintenance of a bureau of general information, and a place of general resort for iron and steel manufacturers. The correspondence of the Association is now very large, and it extends to all parts of the world. The office of the Association in Philadelphia is daily open to members and all others engaged in the iron trade. A library of several thousand volumes has been accumulated, and all the leading trade and scientific journals of the United States and Europe are constantly on file. The present membership of the Association is composed of over three hundred companies and firms engaged in the manufacture of iron and steel, and of a large number of dealers in iron and steel, iron ore, etc. *

The work of the Association has a broader purpose than merely looking after the special interests of the iron trade. It is in friendly intercourse and co-operation with all other organized industries, especially upon tariff questions, and it is enabled to interchange statistics with similar bodies and leading scientists in foreign countries, where its reports are recognized as of final authority. It has nothing whatever to do with the regulation of prices or wages, and its tariff labors are not more for the benefit of employers than workingmen. It has never sought a special privilege; never made bargains with hostile powers for rights or immunities of any kind; and has asked for no advantage to the iron trade which would not be for the benefit of the whole country.

REGARDING CANADIAN MADE STEEL.

In an account of the evidence taken in Toronto by the Ontario Government Mining Commission, as reported in the *Empire* of December 1, Mr. H. A. Massey, President of the Massey Manufacturing Company of this city, was reported as saying: "As to steel, the production in this country is not now nearly up to the demand, and it is rather inferior in quality. The Nova Scotia people make very good steel, but they cannot supply a tenth of the requirements of the country. Steel is imported from England and Pennsylvania. The consumption in Canada would take all the production of a large manufactory; and it would be advisable to have such an enterprise started. If any one industry in Canada should be encouraged it should be the manufacture of steel."

This language is rather ambiguous. There is but one steel manufacturing plant in operation in Canada, that of the Nova Scotia Steel Company, of New Glasgow, N. S., yet Mr. Massey is reported as saying "the production of steel in this country is rather inferior in quality," and also that "the Nova Scotia people make very good steel." So, too, when he is made to say "the consumption of steel in Canada would take all the production of a large manufactory," it might be presumed by those not acquainted with the facts, that there was no such manufactory in Canada.

No one would suppose that Mr. Massey had any intention of saying anything other than well of the products of the Nova Scotia Steel Company, which he uses largely in his business, and has abundant opportunity of comparing with imported steel used for like purposes. He has testified to the superior quality of the machinery steel made for him by the Nova Scotia Company, declaring it equal, and in many respects superior to similar steel which his company have imported from Europe; and he has expressed the opinion that if the Nova Scotia Company continued to make such steel, Canadians would have little excuse for importing.

We have been favored with a letter from Mr. Massey on this matter as reported in the *Empire*, in which he says that his testimony before the Commission was not given in full, and in some particulars reported in a sense different from what was intended. He explains that the Nova Scotia Company do not make steel suitable for all kinds of work; and as regards the supply, the idea he intended to convey was that they could not manufacture one-tenth the requirements of the country—meaning for railway purposes as well as manufactur-

ing. In reference to the statement that the consumption of steel in Canada would take all the production of a large manufactory, this was said in regard of cold-rolled steel, an article used largely for shafting, etc., and that for these purposes a large manufactory would be required to supply all the demand, hence it would be very desirable to have such an enterprise started in Canada. Mr. Massey tells us that there are but two or three concerns in the United States which manufacture this particular sort of steel, the plants of which are necessarily very expensive. It was more especially in regard of this kind of steel that he urged the importance of its manufacture in Canada.

It is greatly to be regretted that the ignorance or carelessness of newspaper reporters, who do not know the importance of correctly reporting such technical matters, should allow them to make such blunders, throwing discredit on the fast growing industries of the country, and that at a time when the aim of all Canadians should be to give full credit wherever credit is due. So far as the Nova Scotia Steel Company is concerned, their regular customers will not be influenced by such a newspaper blunder as that here alluded to; but in a general way such statements do harm. In urging the establishment of another steel plant in Canada, Mr. Massey evidently meant a plant for the manufacture of crucible steel, which article is not made in Canada, and not for the production of Siemens-Martin open hearth steel, which is manufactured of the very best quality by the Nova Scotia Steel Company.

SPECIAL ADVERTISEMENTS.

TISDALE'S BRANTFORD IRON STABLE FITTINGS.—We lose no job we can figure upon. Catalogue sent free. The B. G. Tisdale Co., Brantford, Canada.

KNITTING **CREELMAN BROS.,** **MACHINES.**
Georgetown, Ont.

EDITORIAL NOTES.

CONCERNING the liquidation of the Central Bank, of Toronto, in the hearing before the Master in Ordinary of the application of Messrs. W. H. Howland, Henry Lye and William Gooderham, the liquidators, for compensation in respect of their services in winding up the affairs of the bank, it was shown that the liquidators had received and disbursed an aggregate of \$1,167,142; and for doing this it was asked that the court allow them \$56,345.31. It was in evidence that since their appointment in January last the time devoted to this business by these gentlemen was as follows: Mr. Howland, 2,128 hours; Mr. Lye, 2,611 hours, and Mr. Gooderham 798 hours, a total of 5,537 hours. The pay demanded is at the rate of more than \$10 per hour.

"How are the mighty fallen." Two years ago the Knights of Labor numbered 750,000 members, and Mr. Powderly was a man to whom politicians in the United States Congress showed marked attention by requesting his views on the labor

question, and on a proposed amendment to the constitution in that direction. At the recent Indianapolis convention it was shown that the membership of the order at this time actually numbers less than 200,000; and instead of the harmony and confidence of two years ago, dissensions prevail, destroying or impairing whatever usefulness existed, and those who were once counted among the order's warmest friends are now doing all they can to disrupt it. *Sic transit gloria mundi.* It went up like a rocket and came down like a stick.

The *Canadian Grocer*, speaking of the failure of the compulsory early closing law in this city to force the early closing of the smaller shops and stores, suggests that the surest way to secure that object is to constantly agitate the question. It is "quite certain that a year or two of agitation in this direction would close three-fourths of the retail stores at seven or eight o'clock every night." No doubt of it. A fair and strong effort was made to enforce the law, but it was found that persistence in that direction would result in not only closing three-fourths of the stores at seven or eight o'clock every night, but for twenty-four hours a day indefinitely. It is quite certain that a year or two more of continued agitation in this direction will effectually effect this result.

THE Canada Mutual Fire Underwriters' Association have instructed their executive committee to procure a conference with the manufacturers of steam threshers "to request them to set the engine at a much greater distance from the buildings than is the custom now, thereby lessening the danger of fire." Outside of fire insurance circles the impression prevails that manufacturers usually confine themselves to building steam threshers, and do not operate them. Usually steam threshers are owned and operated by persons who go from farm to farm for the purpose of threshing out farmers' grain—or perhaps some of them are owned by the farmers themselves. At any rate the thresher is located just where the farmer thinks it will be most convenient for his business; and we fail to observe just how the manufacturer is concerned in the matter.

IN Mr. Coste's Report on the Mining and Mineral Statistics of Canada for the year 1887, it is shown that the imports into Canada of glazed tiles, drain and sewer pipe, during that year, were valued at \$90,380, and that the production of the same articles in Canada that year were valued at \$230,068. The facts regarding the imports were obtained from official sources and may be accepted as correct, but the figures having reference to the Canadian industry are evidently incomplete and far below what they should be. Mr. Coste mentions but three provinces from which returns were made, Ontario being credited with a production valued at \$226,546; the value credited to Nova Scotia being but \$435, and New Brunswick \$3,087. No reference is made to the province of Quebec, although it is well known that the Standard Drain Pipe Company's works at St. John are very large, and are being worked to their utmost capacity.

At a meeting of the Tariff Committee of the Canadian Manufacturers' Association, held last week in the offices of the

CANADIAN MANUFACTURER, Messrs. J. Ross Robertson and R. T. Lancefield appeared on behalf of the Copyright Association of Canada, and asked the co-operation of the Manufacturers' Association in their efforts to defeat the proposed Berne Copyright Bill, now pending in the Canadian Parliament, and to secure the passage of a distinctively Canadian Copyright Law by that legislative body. Mr. Robertson stated the matter very clearly to the Committee, Mr. Lancefield making a few explanatory remarks. The matter met with the most favorable attention of the Committee, and resulted in the unanimous adoption of the following resolution :—

Resolved, "That this Committee having heard the remarks of Messrs. J. Ross Robertson and R. T. Lancefield, in reference to the question of Copyright, hereby agree to co-operate with the Copyright Association of Canada in their endeavor to secure the passage of a Copyright Act which will secure justice to the various important Canadian industries entering into the manufacture and sale of books in Canada, while securing justice also to the British author."

THE Canada Mutual Fire Underwriters' Association in their convention in Toronto last week, unanimously passed the following resolution :—

"That the Executive Committee procure a conference at an early date with the manufacturers of steam threshers, in the hope of inducing them to adopt the system of running steam threshers with steel cables, instead of belts, as at present, as the work can be done as effectually with the former as with the latter; and to request them to set the engines at a much greater distance from the buildings than is the custom now, thereby lessening the danger of fire."

It would appear from this that it had been discovered that "belts" as operated on steam threshers are a fruitful source of fire; that "steel cables" are not of such incendiary character, and that the transmission of power from steam threshing engines can be done as effectually with steel cables as with belts. What the average fire insurance agent don't know about engineering as applied to steam threshing would fill a book. What he thinks he knows and is ready and willing to communicate to the manufacturers of steam threshers would probably fill a large library. If the manufacturers desire accurate information regarding their business, let them apply to the Canada Mutual Fire Underwriters' Association.

THE recent development of processes for lighting by electricity has been phenomenal, and the march is still onward. A few years ago the exhibition of a few arc lights in the streets of the larger cities was considered a luxury to be indulged in only by the rich; now the processes have been so simplified, and the cost of lighting so materially reduced, that but few towns in the country, and no cities, are without their complete systems of street lighting. So, too, but a few years ago only such places as public halls, theatres, etc., resorted to incandescent lamps for illuminating purposes, while now such system is fast driving out gas, coal oil and similar illuminants in factories, mills, workshops and churches; and many private residences are now equipped with incandescent chandeliers, groups and single lamps in as great or greater abundance than the fast disappearing gas-burner, and at as low or lower cost. At one time it was considered that some steady and reliable

motive power such as steam or water, was absolutely necessary for driving dynamos; but inventive genius has developed storage batteries, by which the electricity may be generated at different and odd times, to be used only as required; and now even windmills, which are to be found on almost all farms, and which can be erected on almost any building, either in city or country, can be utilized for the purpose of charging storage-batteries which will afford the electricity for illuminating city and country residences, and for many domestic mechanical purposes, such as operating churns, sewing machines etc. "Electricity is life."

REGARDING the question of industrial education, speaking of the fact that a deputation from the Dominion Trades and Labor Congress had recently waited upon and informed the Ontario Minister of Education that labor organizations viewed with distrust the introduction of manual training into the public schools, *The Week* says :—

"The workingmen of Canada will make a grievous mistake if they allow themselves to be persuaded to oppose this great educational reform. With just as much reason might clerks, book-keepers, professional men, and, in fact, all whose callings require a certain amount of intellectual training, organize themselves into guilds and protest against the teaching of reading, writing and arithmetic in the schools. They might dwell upon the injustice of being compelled to pay taxes for the purpose of training up boys and young men by the thousand to become their future competitors in the various branches of mental industry. The one argument would be just as good as the other. It must be that the deputation and those whom they represent quite misapprehend the kind and scope of the manual training proposed to be given in the schools. To train a boy's hands and eyes and brains by means of the tools and other appliances of the work-shop and laboratory is no more to teach him a trade than to train certain other faculties of reasoning and reflection and judgment by means of book and pen and pencil is to teach him a profession. The true aim of education is to develop *pari passu* all the faculties of body and mind, that the future man may have full control of all. To this end the cultivation of the hands and the perceptive powers, hitherto so much neglected, is just as essential as the cultivation of what we are accustomed to call the higher faculties. The wonder is that modern intelligence has been so slow to recognize the truth."

SCHOOL OF PRACTICAL SCIENCE.

A MEETING was held in the office of the CANADIAN MANUFACTURER, Dec. 13, 1888, consisting of manufacturers and others interested in the advancement of technical education in connection with the School of Practical Science. The meeting was called to order by Mr. S. S. Malcolmson, President of the Marine Engineers' Association of Toronto.

Mr. Wm. Polson was elected chairman, and Mr. Wm. J. Allen secretary.

Those present included Messrs. John Abell, of the John Abell Manufacturing Company; John Ingalls, of Ingalls & Hunter; Wm. Polson, of the Polson Iron Works Company; Wm. J. Allen, Supt. of Toronto Syrup Company; W. J. Mennielly, steam boat inspector; J. Galbraith, Professor of Science; Wm. H. Ellis, Professor of Chemistry; John Galt, Mechanical Engineer; A. Wickens, President of the Stationary Engineers' Society, and S. S. Malcolmson, President of the Marine Engineers' Association.

The subject of Mechanical Engineering was thoroughly discussed with the view of placing the matter before the Ontario Minister of Education, relative to establishing a School of Practical Science as applied to industrial pursuits, the primary training in which should begin in the public schools so that those desiring a mechanical course could pursue it without studying unnecessary subjects; and instead of the dead languages, etc., they might study arithmetic,

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If you want a really good Driving Belt, or any other Belt, send to us and we will give you one which will give you thorough satisfaction. You will find both our prices and the quality of our goods all right.

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NOTE THIS.

On February 26th, 1888, Mr. James Shearer's Saw and Planing Mill in Montreal, was destroyed by fire. The Main Driving Belt in this mill was of "HOYT'S" make, and had been in constant use for 33 years.



(REGISTERED.)

HIGHEST PREMIUMS RECEIVED WHEREVER EXHIBITED.

- "Special Award," Highest Premium American Institute Fair.....New York, 1872.
Award continued for "Maintained Superiority," 1873, '74, '75, '76, '77, '78, '79, '80, '81, '82, '83, '84, '85, '86.
- First Prize Medal, World's Exhibition.....Vienna, 1873.
- " " " Cincinnati Industrial Exposition.....Cincinnati, 1874.
- " " " Centennial Exhibition.....Philadelphia, 1876.
- " " " Leather Manufacturers' Exhibition.....Berlin, 1877.
- " " " Universal Exposition.....Paris, 1878.
- " " " Melbourne International Exhibition.....Melbourne, Australia, 1880.
- " " " Leather Manufacturers' Exposition.....Frankfort on the Main, 1881.
- " " " International Cotton Exhibition.....Atlanta, Ga., 1881.
- " " " World's Industrial Exhibition.....New Orleans, La., 1885.

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algebra, geometry, trigonometry, philosophy, chemistry, etc. This, in order to supply the present want that is felt by men who have to earn their daily bread, and have not had opportunity to study those subjects which they should have had at the common schools. In this connection it would be necessary to establish and continue night schools until they were found unnecessary, as the common schools would then have imparted the knowledge required.

It might also be advisable to endow scholarships, which would not only stimulate the student to greater effort, but enable him to obtain a course in the Art School, which otherwise would be beyond his reach.

The teachers or instructors for the night school might then be obtained from among the pupils of the School of Science at a much less expense than otherwise, and equally beneficial to both instructor and pupil.

A committee might also be appointed to wait upon the Mayor and Corporation to impress upon them the importance of the subject, and solicit municipal assistance to aid the work.

The Technical School, as established in 1878, is not adapted for industrial pursuits. The laboratory, tools, appliances, etc., are not extensive enough for the work intended to be carried on. Civil engineering, in part, is taught there; also the rudiments of mining engineering, neither of which branches of science can be fully imparted without practical work in the field or mine. But what is essential for mechanical engineering is the knowledge of drawing, construction and application of machinery, and to be able to handle steam, wind and electricity to the best advantage, together with the methods and ways of testing the different metals as to strength, durability, adaptability, hardness, ductility, etc. The expert use of tools can be obtained in our several machine shops. To do all this it is necessary to have an engine, boiler, scales, indicator, and all tools essential for such work. To measure power, test the nature of materials and ways of applying power, machines must be provided; and in the course of time chemical apparatus might be added.

Professor Galbraith has visited several of the schools in the United States and took notes or memoranda of the appliances, tools, machines, etc., found in them, and found that thousands of dollars had been spent for machines, etc., which were of little value or use. We may profit from their experience and avoid unnecessary expense. Such a school would prepare many young men to fill positions that are now filled by men imported from other countries.

Applicants for such training are numerous, and are directed to those countries where they can be educated. And it is usually the case that they accept permanent positions in those countries, and are lost to Canada. It is also found that when public work is to be done it is necessary to import men from other countries to do the work that our own men are doing in foreign countries, where they had been drawn to obtain an education that had been denied to them at home.

After discussing the subject thoroughly, it was

Resolved—That this meeting unanimously endorse the opinion that it is highly important and desirable to establish the School of Practical Science on a complete and thorough technical footing, including the teaching of science as applied to industrial pursuits; and that this resolution be presented to the Minister of Education by Mr. William Polson at the meeting on the 19th of December, 1888.

WILLIAM J. ALLEN, *Secretary*.

BOILER EXPLOSIONS.

THE following remarks on boiler explosions were made by Mr. R. D. Munro, engineer of the Scottish Boiler Insurance and Engine Inspection Company (Lmt'd.), Glasgow, Scotland, and apply to the ordinary internally-fired boilers in use at the more extensive factories, where more than two boilers are employed.

"Since the introduction of the Boiler Explosion Act in England in 1882, 223 boiler explosions have been reported to the Board of Trade, which, besides damage to property and other loss, have caused 146 deaths, and serious injury to upwards of 300 persons. In addition to the explosions thus recorded many boiler accidents have occurred which, though unaccompanied by any serious results, have been the means of causing stoppages of work, with consequent loss to employers and employed.

"The investigations made show that the majority of the explosions which have occurred cannot be viewed as accidental, inasmuch as they were due to deterioration and other defects which could have been detected by careful inspection long before their condition became dangerous. The whole history of boiler explosions points to the fact that there have been, and in all probability still are, many boilers at work, which if examined by competent inspectors, would

be found deficient in what experience and rule have proved to be necessary for safety. That a steam boiler should be of good construction and material, properly mounted and set, is of the first importance; but to insure safety it is necessary that all boilers should be carefully attended to when at work and thoroughly examined by qualified inspectors at least once a year. Under such conditions durability and economy will be secured, and the chances of accident or explosion reduced to a minimum.

"Incompetency and neglect on the part of attendants, although amongst the causes assigned for boiler explosions, are charged with a very small percentage of these. This feature is creditable enough in face of a statement still commonly made that no explosion could have occurred unless the fireman allowed his boiler to run dry. Whilst boiler attendants are accredited with satisfactorily performing these duties, for which they are generally held responsible, it must be apparent that the number of explosions would be reduced if the men in charge were trained to take an interest in the working of their boilers beyond the mere mechanical duties of feeding, firing and cleaning. It is not to be expected that attendants should be skilled in boiler construction, but there is no reason why they should not be competent to draw attention to defects before they become dangerous, and to form fairly sound conclusions as to how the safety of boilers is affected by deterioration and other evils to which they are subject. Referring to the training of attendants as a means of obtaining improved supervision of boilers, it has been said that many of them know too much already, as they display great ingenuity in the matter of overloading safety valves and otherwise tampering with boilers, in such a manner as to increase the dangers attending their use. Actions such as are here referred to, however, can only be attributed to ignorance of the dangers involved, and tend rather to prove that if the ability of which such ingenuity is evidence were properly guided, the number of explosions would be reduced and the efficiency of boilers increased. The responsibilities of boiler attendants are variously estimated. According to one aspect it would appear that a fireman has done all for which he can be held responsible when he keeps up the required supply of feed water and throws into the furnace the amount of fuel necessary to evaporate it into steam. According to another, however, the responsibilities of a boiler attendant are of a very high order. Instances of firemen being allowed to give instructions as to repairs and other important matters are by no means uncommon, they being in many steam-using establishments the only individuals who can claim to possess a mechanical knowledge of any kind. Instances are often given of boilers left to the sole management of the attendant, even to the supervision of repairs and alterations, and resulting in such a reduction of strength that they have exploded at the ordinary pressure. The responsibility assigned on the one hand to those in charge of boilers is evidently as far short of what it should be, as that placed upon them by certain steam users is beyond it. Many explosions are the results of defects so palpable that even the most casual inspection should have detected them; and in these cases, if the attendants were made to understand that it was part of their duties to look for and refer all such defects to the judgment of qualified parties, there is no doubt many explosions would be prevented. On the other hand, it is quite evident that the opportunity of safe pressures and giving orders as to repairing and alterations, are duties which none but those who are thoroughly conversant with the strength and construction of boilers are competent to perform.

"Steam users in getting new boilers should first have a detailed specification prepared by qualified persons, who should also be entrusted with the inspection of the material and workmanship during construction. Second, boiler attendants should be made to understand that, in addition to the ordinary stoking duties, it is their business to exercise a general supervision over the boilers and fittings; and all defects observed when boilers are under steam or being cleaned should be carefully noted and reported for the attention of the inspector; and third, all boilers should be examined in every part at least once a year by a thoroughly competent inspector, whose business it should be to apportion safe pressures, give instructions as to repairs, and generally to advise the steam user and attendant in all matters relating to the boilers under their charge."

MESSRS. GEO. F. HAWORTH & Co., Toronto, inform us that they have just supplied a large main driving belt for the Dominion Show Case Works of Messrs. Wagner, Zeidler & Co., at West Toronto Junction, this city. This belt is made of Hoyt's pure oak leather manufactured expressly for Messrs. Haworth & Co., which, as they say, is "known the world over." The main driving belt which was in Mr. James Shearer's saw and planing mill in Montreal, which was destroyed by fire in February last, was of Hoyt's make, and had been in constant use for thirty-three years.

Manufacturing.

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.

MR. WALTER ROSS is erecting a saw mill near Keewatin, Man.

MESSRS. HALL BROS. & BROWN are building a sawmill at Keewatin, Ont.

THE Cordovan Tannery at Acton, Ont., is having a forty-foot extension built.

BOTH natural gas and petroleum have been struck in a well being bored in Tilsonburg, Ont.

A FINE flow of natural gas has been struck at St. Catharines, Ont., at a depth of 312 feet.

THE Rogers elevator at Clearwater, Man., was destroyed by fire Dec. 9; loss, about \$15,000.

THE Canada Meat Packing Company, Montreal, are building a factory in that city at a cost of \$18,000.

THE Ball Electric Light Company, Toronto, will put in an electric light system in the town of Mitchell, Ont.

THE Hamilton Steel Wire Nail Company, Hamilton, Ont., has been incorporated, with a capital stock of \$50,000.

THE Potter-Compton Electric Light Company of Canada, of Toronto, has been incorporated with a capital stock of \$50,000.

THE Ontario Hedge and Wire Fence Company, Windsor, Ont., are running their works full time. Their goods are in great demand.

MESSRS. BIGGAR & SON, glove manufacturers, Galt, Ont., are filling a large order for leather gloves for the use of the Mounted Police.

A PORTION of the furniture factory of Messrs. G. S. Tickell & Sons, at Belleville, Ont., were destroyed by fire Dec. 13; loss about \$12,000.

MESSRS. McLAUGHLIN BROS., of Arnprior, Ont., who have extensive sawmills at that place, will build a set of mills near Papineauville, Que.

MESSRS. WARNOCK & NELLES, Ingersoll, Ont., will be granted a bonus of \$5,000 by that town to assist them to start up the old Ingersoll foundry.

MESSRS. F. F. DALLEY & Co., Hamilton, Ont., have opened a branch warehouse at 18 Front-street west, this city, for the sale of their specialties.

THE company formed in Ottawa a short time ago to bore for natural gas have begun operations. The machinery is now being placed in position.

THE Grand Trunk Railway Company are building a grain elevator at Midland, Ont., which will have capacity to hold 750,000 bushels of grain.

MR. F. PARKIN, proprietor of the Galt File Works, Galt, Ont., will increase the capacity of his works by the introduction of steam power and other improvements.

THE Wahnapiatae Mining Company has been incorporated in Ontario with a capital stock of \$30,000, and will carry on a general mining business in Nipissing, Ont.

MESSRS. WISHART & OLIVE, Sherbrooke, Que., are making rapid progress in the erection of their new hardware factory. The main building, built of brick and stone, will be 100x30 feet.

MR. SAM. SLOAN, of Tilbury Centre, Ont., will enlarge his planing mill. He will put in a sixty-horse-power boiler and engine, adding sawmill and other machinery for wood-working.

BRUSHES

Paint, Whitewash, Kalsomine, Household Brushes.
Horse, Factory, Machine Brushes, etc., etc.
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THE Levis Boot and Shoe Manufacturing Company—La Compagnie Manufacturiere de Chaussures de Levis—with headquarters at Levis, Que., has been incorporated with a capital stock of \$20,000.

THE output of the Canada Phosphate Company's mine this season exceeded six thousand tons. One hundred and eighty men are employed, and the number will be increased next season owing to the improved demand.

THE Assiniboine Water Power Company are applying for incorporation for the purpose of constructing a dam and other necessary works in connection with a water power on the Assiniboine river at or near Winnipeg.

THE Dominion Hat, Cap and Fur Company, of Toronto, will probably remove their factory to Paris, Ont. They now employ about eighty hands, but in new and larger works they would increase that number to at least 250.

MR. R. E. STEEVES, of Hillsboro, Albert county, has purchased an engine and the appliances for a new rotary steam saw mill he is now building at Hillsboro. The mill will saw about two millions a year.—St. John, N.B., *Globe*.

MESSRS. QUERRIE BROS., proprietors of the Novelty Carriage Works, Aurora, Ont., have a contract with the Toronto Passenger Transport Company for their new omnibusses, some of which have already appeared on the streets of this city.

THE North Pacific Canning Company has recently been formed at Victoria, B.C., and will erect the necessary works on the Skeena river for carrying on the salmon canning business. The works will have capacity to put up about 20,000 cases a year.

At the works of Goldie & McCulloch they are now getting out twenty-four sets of roller machines for one mill in Montreal. As this mill has already eleven set it will be, when these twenty-four are added, the largest flour mill in Canada.—Galt, Ont., Reporter.

THE snow sheds on the line of the Canadian Pacific Railway west of the Summit, in the Rocky Mountains, recently completed by Messrs. D. B. Campbell & Co., the contractors, cost \$50,000. 1,500,000 feet of timber and lumber were required in the construction.

MESSRS. WHITE, HENDERSON & SON, Campbellford, Ont., who are successors to Messrs. James White & Co., are making important improvements in the foundry and machine shops formerly operated by Messrs. White & Co. They will give special attention to repairing saw mill machinery, etc.

THE Canada Bank Note Company, Montreal, held their annual meeting in that city, Dec. 6. The old officers were re-elected. These gentlemen wish it to be known that there is no truth in the rumor of amalgamation with another concern which has of late been spread by irresponsible parties.

THE Bell Asbestos Company will take out of their Quebec mines this season about 1,200 tons of asbestos. Air compressors, steam, drills and the latest labor saving appliances are in use in these mines, and it is estimated that their profits on the present season's work will figure close upon \$50,000.

MESSRS. MCGREGOR, GOURLAY & Co., Galt, Ont., will introduce wire drawing machinery into their works. Messrs. Goldie & McCulloch, of that place, will supply a 125-horse-power Wheelock steam engine for the motive power. The municipal authorities of the town will grant the usual exemptions.

MR. BARNETT, the superintendent of the G.T.R. works at Stratford, Ont., states that the shops are now far enough advanced to admit of the transfer from Hamilton being made at once. Mr. Barnett has accordingly given orders for the removal of the men and remaining machinery, to be pushed actively until the transfer is complete.

FOURTEEN tenders have been received at the Department of Railways and Canals for the work of deepening the channel-way at both the upper and lower entrances of the Sault canal; the construction of a landing-wharf, pier, beacon, etc., at the lower outlet, and a pier at the upper end of the island, beacon, etc. The cost will be about a million dollars.

THE Cowles Electric Smelting and Aluminum Co., Lockport, N. Y., inform us that they have by improved methods recently reduced the cost of ferro-aluminum to twenty-six to thirty cents per pound, subject to discount on large orders. The use of ferro-aluminum in the production of perfectly uniform steel castings is rapidly coming into prominence.

THE new Government dry dock at Kingston, Ont., will have a bottom area 280x40 feet, and at the coping 300x72 feet. It will be thoroughly equipped with pumping machinery, so that the 350,000 cubic feet of water it will contain can be emptied in three and one-half hours. It will take two years to build the dock, and the probable cost will be \$300,000 or \$400,000.

THE Wilkinson Plow Company, Aurora, Ont., manufacture 10,000 plows and 2,000 scrapers annually, to the production of which two articles they confine their operations. Their works embrace a foundry 48x62 feet, blacksmith shop 70x48, finishing shop 96x30, paint shop 72x30, grinding shop 96x20, one store house 72x30, and another 130x23, and various other buildings.

THE McClary Manufacturing Company, a part of whose extensive premises in London, Ont., were recently destroyed by fire, announce their ability to promptly fill all orders. This can be accomplished from the stocks held at the company's warehouses in Montreal, Winnipeg and Toronto. The machinery in the London works will be again in running order by the first of January.

Leeds Foundry and Machine Works.

E. E. ABBOTT,

MANUFACTURER OF

Vertical Drills, Shears,

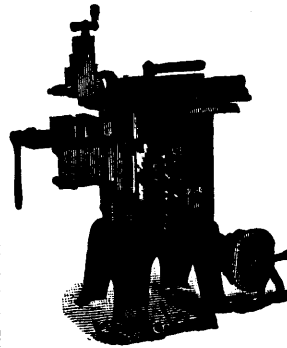
IRON PLANERS,

Punching Presses, Rolls,

BOLT CUTTERS

AND

SPECIAL TOOLS FOR WORKING
IRON AND WOOD.



GANANOQUE, - ONTARIO.

MACHINE BRUSHES

All kinds, Made to Order.

Highest Quality of Work Guaranteed.

SEND FULL PARTICULARS OF DIMENSIONS
AND QUALITY WHEN ORDERING.

OLD ROLLERS OR BLOCKS RE-FILLED
WITH SPECIAL CARE.

CHARLES BOECKH & SONS

MANUFACTURERS,

Office and Warerooms: 80 York St.

Factory: 142 to 150 Adelaide St. West,

TORONTO, CANADA.

Balcony Fire Escapes

(BATTEN'S PATENT)

ADVANTAGES:

The advantages of the BATTEN FIRE
ESCAPE over all others are:

That the balconies are made of the best wrought iron, of any ornamental design or pattern, and securely bolted through the walls. Can be made any length or width. The brackets and flooring are capable of bearing any number of persons standing on them. The ladders, with wide steps and of easy grade, can remain down permanently, or folded up, as desired, showing the ornamental balcony only in sight, which does not mar the architectural beauty of the building, and can be instantly released when desired. No ice or snow will remain on them, neither will the working parts rust; and they will work admirably in any weather.

A Stand Pipe is also connected for high buildings, with valves at each floor and on the roof.

Our Escapes have been fully tested at fires and proved themselves invaluable for saving life and property. Iron guards on windows of Asylums and Reform Schools can be so adjusted as to be instantly released in the case of fire by the unfolding of ladder or sounding of a gong.

Sole Manufacturers for Canada,

NIGHOLLS & HOWLAND,

The Permanent Exhibition of Manufactures
and Commercial Exchange,

63 to 69 Front St. West, TORONTO.

A FEW days ago a 100-ton block of granite was shipped from the quarries at Yarmouth, N.S., to Chicago, which is to be made into a monument to the late "Long" John Wentworth, who was the first mayor of that city. The rough ashlar is seventy-five feet long, six feet square at the base, and weighs one hundred tons. It was carried upon two flat cars specially arranged for the purpose.

THE proposed bridge of the Canada Atlantic Railway Company across the St. Lawrence river at Coteau, Que., is to be a low level one, with a swing in the navigable channel of the river. It will stretch from the main shore on the north side of the river to Giroux Island, from Giroux Island to Round Island, and Round Island to Clarke's Island, the total length of bridging, including abutments and piers, being 4,050 feet.

MESSRS. ROBIN & SADLER, manufacturers of leather belting. Montreal and Toronto, are introducing a new water-proof belting which they describe as being made in both light and heavy double leather, of the best material, fastened with waterproof cement and brass wire screws, after which the entire belt is saturated with a preparation which renders it entirely water-proof. Machinery owners are advised that they will find this new article in belting especially adapted for damp places.

GREAT progress has been made in the supplying of power from central electrical stations. The saving to the consumer is considerable, while the convenience is very great. A three-horse-power motor occupies half the space of a flour-barrel. A 300-horse-power motor is as big as an ordinary dressing bureau. The cost is about \$3 a week for each horse-power. For small manufacturing industries, for printing presses, elevators and sewing machines, the steam engine will soon be a thing of the past.

THE Toronto Incandescent Electric Lighting Company, of Toronto, has been organized, with a capital stock of \$200,000. The following named gentlemen were the incorporators:—Messrs. H. S. Howland, W. R. Brock, R. Jaffray, H. P. Dwight, Hugh Ryan, Frederic Nicholls, J. K. Kerr, Joseph Simpson, R. McLennan, Geo. A. Cox, Alex. Manning, John Scully, Henry Lowndes, Edgar A. Jones, all of this city, and Wm. Bell, of Guelph, and John R. Barber, Georgetown. Mr. Frederic Nicholls is Managing Director.

MR. H. W. MESSER, superintendent of the Williams, Green & Rome shirt factory at Berlin, Ont., has invented a long-felt want in shirts. It overcomes the gaping in the back, and the neck-band adjusts to the size of the collar of the wearer. It neither opens at the back or front and does not require any buttons or button holes to fasten it, thus overcoming one of the greatest of man's annoyances. He has applied for a patent in Canada and the United States. He has also just received a patent on a lawn and hammock chair, which he also invented.

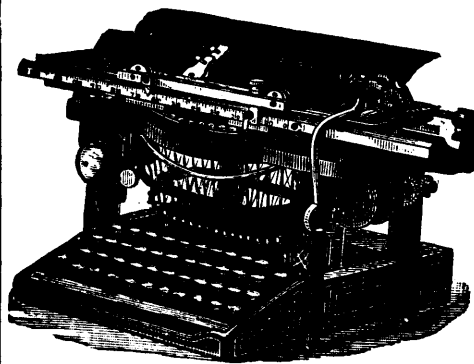
Baldwin's Textile Designer, of Brasher Falls, N.Y., will, in its January issue, publish the portrait and biography of Mr. J. M. Masson, of Peterborough, Ont. Mr. Masson is the writer of the articles appearing in that journal on "Talks about Oil," which is evidence that he is a man of no mean experience in the mill business. He has many valuable, new ideas in dress goods, new combinations in materials and fabrics, and would be a good man for any manufacturer to communicate with in regard to such goods, or for information relating to his many experiments.

If appearances go for anything, the new factory exempted from taxation at the council Monday, should prove a big concern. A model of the harrow proposed to be manufactured can now be seen in the old Harris works. By an ingenious contrivance the teeth can be raised off the ground at will by the driver, and the whole thing become folded up so as to be easily driven along roads, etc., instead of being carried on a wagon to the field of operations, the custom now in vogue. Mr. W. Hewitt is the inventor, and the factory will be started at once.—Brantford, Ont., *Courier*.

FIRE broke out on the night of November 30, in the building occupied by the McClary Manufacturing Company, Ontario, Canada. The loss on the building is estimated at \$20,000, but the loss on the manufactured goods, stock in process of manufacture, tools, machinery, etc., will be much greater. The tin shop of their vast establishment was almost totally destroyed.—*American Artisan*, Chicago. [This is a very indefinite location. "Ontario, Canada," is a Province much larger than the State of New York and contains an equal population. The McClary works alluded to are in London, Ontario.]

A MEETING of the Canadian Canned Goods Packers' Association was held in Hamilton, Dec. 6. A good part of the time was taken

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Gold & Silver Medal

BY
CANADIAN
Shorthand Society
Aug. 13, '88.

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TORONTO.

MUNDERLOH & CO.

MONTREAL,

SOLE AGENTS FOR THE DOMINION

OF

Meyer's Watchman Control Clock.

REDUCED PREMIUMS ON FIRE INSURANCE
SECURED BY USING THIS CLOCK.

Description and particulars on application.

CANADIAN TEAZELS.

PATRONIZE HOME INDUSTRY

Every user of Teazels should purchase those of
Canadian Growth in preference to Foreign
Importations.

ORDERS FILLED BY

F. W. SCHWENDIMAN, DRAYTON, ONT.

OR

THE DOMINION DYEWOOD & CHEMICAL CO
TORONTO, ONT.

IMPORTANT TO TEXTILE MANUFACTURERS AND ALL WHO DESIRE
TO SELL TO THE MILLS.

THE BLUE BOOK

A Pocket Directory of the Cotton, Woolen and Worsted Mills, Dyers,
Bleachers and Print Works of the United States and Canada.

Compiled to meet the demand for a small, compact Directory (as the large and cumbersome Directories contain a mass of matter of no interest to mill men). It gives name of place, county, railroad (or nearest railroad station), hotel, telegraph and express; name of mill, proprietor or company agents, and superintendents; class of goods made; number of cards, looms, spindles, knitting and sewing machines, boilers, water wheels, and if there is a DYE-HOUSE.

It contains full particulars of ALL NEW MILLS under construction, with probable date of completion. As much care has been taken, and as full particulars are given of a 1-set mill as of the largest.

Manufacturers and travelling salesmen who subscribed for it, and have received their copies, pronounce it the most accurate and complete Directory of the Trade ever published. Size, 7 by 4 inches.

Price, postpaid, \$2.00, bound in cloth; \$2.50, bound in leather.

(Canadian Bills accepted).

JAMES E. PALMER, 176 Broadway, New York.

up in the discussion of an arrangement whereby the present very serious cutting in prices will be prevented and at the same time the quality of the goods packed improved. In order to avoid disputes it was decided that in the future the standard tins should be the same size as those in use in the States, and they should be designated as 1's, 2's, 2½'s, 3's, 6's and 8's, the latter taking the place of gallons; also that there should be 48 1's to a case; 24 2's, 2½'s and 3's, and 12 6's and 8's.

The Imperial Oil Company of Petrolea, Ont., who operate with a capital stock of \$500,000, have a very extensive and complete plant that includes over forty-six acres of land at Petrolea and over ten acres at London, Ont. They have their own wells, their own steam cooperage, where they make their own barrels, and are owners of machinery for the manufacture of patent tin cans; thus placing this company in position to place the products they manufacture into barrels or patent tin cans made by themselves, insuring uniformity of the oils, and also of what is of great importance, good, sound, uniform and regular packages of every kind.

The Customs Department made the following tariff decisions during the months of October and November:—Cotton seed bran, 20 p.c.; coconut oil cake, 20 p.c.; galvanized wrought iron tubing over 2 inches diameter, 30 p.c.; letter copying books, 35 p.c.; Parian busts or statuettes, 30 p.c.; paper boxes embellished with chromos, etc., 6 c. lb. and 20 p.c.; pencil cases of all kinds, including gold, silver or plated, 25 p.c.; vases, glass, plain or fancy, 20 p.c.; vases, china and porcelain, 30 p.c.; vases, earthenware, 35 p.c.; wool noils, dyed, 20 p.c. The items "vases" are not intended to include articles that should be classed as "table ware."

By agreement between the Government of India and Mr. John D. Noble, acting for the Petrolea Oil Company, a tract of 50,000 acres of land in the Punjab was leased to him for the purpose of boring for petroleum in that country. A consignment of machinery and drilling tools has been shipped via New York and London, for India. Mr. David Boyle, an experienced mechanic and driller, goes out in charge of the tools, and will be employed there by the company, under the superintendence of Mr. W. J. Townsend, of Rawal Pindi. Mr. R. E. Slack also goes to Kurrachee, India, to assist in the petroleum operations there. He has been engaged by Mr. Alva Townsend for the Assam Railway and Trading Company of India for two years.—Petrolea, Ont., *Advertiser*.

The Montreal agents of Messrs. Wm. Bell & Co., piano manufacturers, Guelph, Ont., are in receipt of a letter from Prof. J. B. Labelle, organist of Notre Dame church, Montreal, in which he says:—"After having played on the piano of Messrs. W. Bell & Co., of Guelph, Ont., it is impossible not to bear testimony to the qualities which have acquired for them the good reputation which they already enjoy. The pianos of their manufacture are exceedingly remarkable for their qualities of tone. The bass is powerful without harshness, and the upper notes sweet, clear and mellow. I consider the Bell pianos the best made in Canada, and I act upon my principle and give you an order to furnish one for my own use. Canada is to be congratulated in having produced the Bell piano."

MESSRS. ROBIN & SADLER, leather belting manufacturers, of Toronto and Montreal, inform us that they have just completed putting in all the belting required in the new mill of Messrs. J. B. Smith & Sons, on Strachan avenue, Toronto. The main driving belt is eighty feet long, twenty inches wide, double thickness, and was put on by them endless at the mill. It contains no rivets, sewing, or any other fasteners except cement, to keep it together. They claim that belts made by this process are much smoother running and will also transmit more power, owing to a closer contact with the pulley surface. This firm have recently put on a large number of very large driving belts in different parts of the country, which give the very best of satisfaction. They have just completed a twenty-inch double belt for the Crossen Car Works at Cobourg, Ont., similar to the one above described.

The Canadian Pacific Railway Company intend, in the future, to manufacture their own cars, that is, as many as possible. Hitherto they have had to purchase the greater proportion of their cars from builders in Ontario and the United States. Some very fine shops are now in course of erection at Hochelaga, near Montreal, specially designed for building cars. The sheds are built in circular shape, the outside circumference measuring no less than 1,380 feet. At present only one-half of this circle is completed, and the building erected contains three divisions, separated by fire-proof walls, each division consisting of three tracks, or sections. Good light is obtained by means of a skylight measuring sixteen feet by twenty feet, and four large windows. In the centre of the yard is a turntable, measuring sixty-five feet in diameter, with which each section communicates by a track.

HENRY PORTER,

MANUFACTURER OF

LEATHER

BELTING

432 to 442 Visitation Street, Montreal, Que.

AND

36 FRONT STREET EAST, TORONTO.

Mill owners will do well to write for estimates before placing their orders.

Standard Drain Pipe

I am prepared to supply in any desired quantities first-class **CANADIAN SALT GLAZED VITRIFIED FIRE CLAY DRAIN PIPE**, manufactured by the Standard Drain Pipe Company, of St. John's, Que.

ROBT. CARROLL, 66 Adelaide St. West,

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BELLEVILLE, ONT.

Engineers, Machinists, Boiler Makers,

Foundrymen and Bridge Builders.

RAILWAY and CONTRACTORS' SUPPLIES A SPECIALTY.

Frogs, Diamond Crossings, Switches, Hand Cars, Lorries, Velocipede Cars, Jim Crows, Track Drills, Semaphores, Rail Cars, Double and Single Drum Hoists, etc., etc.

COWAN & BRITTON,

GANANOQUE, ONT.

MANUFACTURERS OF

Strap and T. Hinges, Screw Hooks and Hinges, Wrought Steel Butts for Builders and Cabinet Makers, Washers, Staples, Hooks, Hasps, Hay Carrier Hooks, Patent Hasp Locks, Bed Fasteners, Steel and Iron Cut Nails, Clout, Truck and Finishing Nails, Brads, Tacks and Shoe Nails.

We are also prepared to make special Nails or Hinges, or other articles made from iron from samples. The quality of our goods is always A. 1, and our facilities for making them are unequalled.

MR. LOUIS WERTHEIM, the largest asbestos manufacturer of Frankfurt, Germany, accompanied by his son, Mr. Ed. Wertheim, has been visiting several asbestos properties in the province with a view to purchase. We are informed that he has taken over Dr. Reid's property in Coleraine, consisting of 100 acres, paying in cash \$40,000. He is also negotiating for a further purchase of 300 acres in Range A of Coleraine. Capt. W. L. D. Learmonth has been left in charge of the property. An extensive working plant, consisting of steam drills, air compressors, 100 horse-power engine, derricks, etc., is being purchased, and every effort is being made to work the property on a large scale. Operations have begun and will be continued during the winter. Mr. Wertheim is greatly pleased with the appearance of our asbestos mines, and speaks very highly of the quality of the mineral, which he has been importing largely for some time.—*Mining Review.*

MR. H. C. THURBER, of Marquette, Mich., has organized a company and bought the Sarnia oil refinery, and as soon as the necessary stills, etc., have been placed, will begin the refining of petroleum. The new refinery will be in operation about New Year's. It is stated that by the new process equally as good refined oil can be secured from crude product as that now refined in the United States. As the crude oil found in Canada is identical with the greater part of the Ohio supply, the experiment will be closely watched, and its success will solve a problem which has attracted much attention of late years. It will prove especially valuable to Canada, as there is a duty on refined oil. The Ohio product, now largely used for axle-grease, machine oils and for other than illuminating purposes, will, if the new theory proves a success, enter into active competition with the Pennsylvania product so largely used for family purposes as an illuminating agent.

MESSRS. EDWARD GREEN & SON, New York city, have sent us a finely illustrated description of Green's fuel economizer, for heating the feed water for steam boilers. Briefly stated, this apparatus consists of sets of cast-iron pipes made in sections, with suitable connections, placed so as to utilize the gases that are usually wasted in the combustion of fuel. The feed water is forced into the economizer by the pump or injector, where it is heated before introduction into the boiler. The apparatus can be introduced without stoppage of works; the sections of pipes are interchangeable, and all parts are accessible without removal of the encasing brickwork. A number of tests are reported in detail, showing the advantages of the system as demonstrated in some of the most important manufacturing establishments in both the United States and England; and a long list is given of names of concerns who have it in use. We are told that this apparatus is used in connection with 130,000 boilers in America, Great Britain and all the manufacturing countries of the world.

WHAT are now the works of the Wm. Hamilton Manufacturing Company, at Peterboro, Ont., were built some forty-six years ago, and came into possession of Mr. Wm. Hamilton in 1857, who has conducted them ever since, and under whose management they have attained their present high reputation among the prominent iron manufactories of Canada. The main building is a two-story brick, covering an area of 600x50 feet, and several other buildings occupy the premises, one having been built last summer which is 166 feet long and two stories high. Though these works cover a wide range of products, the concern make a specialty of the heaviest class of sawmill machinery, including engines and boilers. Their band sawmill for cutting very large logs, recently introduced, is attracting the attention of leading mill men. These works also manufacture circular sawmills, gangs, steam feeds of different designs, steam and friction log canters, Covell's patent saw sharpeners, shingle mills, edgers, jointers, drag saw machines, marine engines and boilers, hand and horse capstans, etc.

THE Northumberland Paper and Egg Case Company, Campbellford, Ont., is an important industry. Mr. E. G. Burk is the moving spirit of the concern. The works are equipped throughout with the most improved machinery for the manufacture of straw board, about 3,000 tons of straw being consumed annually. The mills are lighted by Ball's system of electric light. Box board, plain and tar building paper, roofing and moth proof carpet felt are the products of this mill, the capacity of which is about twelve tons per day. The machine for the manufacture of straw board egg-cases is an ingenious contrivance. The board is fed into the machine from a roll; the mortices are cut by a set of dies; when the board is advanced another stage it is cut off with a knife and placed in a set of grips, which are carried over to the other side of the machine, when another set of dies and knife cut another roll, placing the strips at right angles to the first, and then shoving each strip into the mortices of the other. The mortices are so cut that each strip

TO LET.

TO MANUFACTURERS.

FACTORY, with water privilege, near Black's Bridge, Montreal. Building 60 x 60, five flats, extra well lighted and very strong; rare opportunity for party wanting cheap power. Apply

WM. JOHNSON & CO.

14 St. John St., Montreal.

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Fine Manufacturing Premises in a central part of the City of Toronto, 100 x 100 feet, with Engine, Boiler, Shafting, Steam Heating, Gas and Water Pipes and other fixtures.

FOR PARTICULARS APPLY TO

J. D. HENDERSON,

8 King St. East, Toronto.

FOR

Cylinder, Machinery & Wool Oils

WRITE TO

ROYAL OIL COMPANY,
1, 3 & 5 Sherbourne Street,
TORONTO.

OUR MOTTO: "High Class Oils at Low Prices."

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Hunting,	Cycling,	Athletics,	Boating,
Camping,	Baseball,	Yachting,	Football,
Fishing,	Driving,	Canoeing,	Etc., Etc.

ALL WINTER AND SUMMER SPORTS.

TERMS: \$3.00 Yearly. Single Copies, 25 Cents.
SPECIMEN COPY FREE.

PUBLISHED BY **OUTING COMPANY (LTD.)**

239 Fifth Avenue, New York.

is firmly locked into the other, so that they cannot be separated. It is the only machine of the kind in Canada, and Mr. Burk owns the Canadian patent.

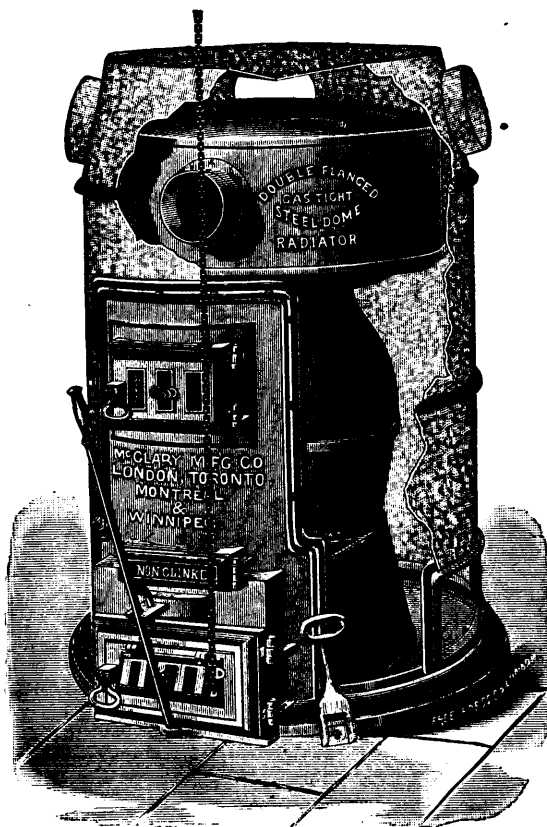
The *American Miller* gives a full-page illustration of what it call "a splendid group of Canadian flour mills," reference being had to the five large mills belonging to Messrs. A. W. Ogilvie & Co., and liberal space is given to descriptions of them. The Glenora mill, on the Lachine canal, has a capacity of 1,000 barrels a day, the elevator used in connection with it being capable of holding 300,000 bushels of grain. The Gooderich mill, at Gooderich, Ont., has a capacity of 900 barrels a day, with elevator of 200,000 bushels capacity. The Royal mill, at Montreal, although built to manufacture 1,500 barrels of flour a day, has turned out 1,700 barrels. The Winnipeg mill has a capacity of 900 barrels a day, and its elevator has a capacity of 240,000 bushels. The Seaforth mill, at Seaforth, Ont., is a 300 barrel mill, its elevator having a capacity of 40,000 bushels. The firm was originally composed of A. W. Ogilvie, John Ogilvie and W. W. Ogilvie. In 1875 A. W. Ogilvie withdrew from the firm, and the business was continued under the same name by John and W. W. Ogilvie. Upon the death of John Ogilvie last July, W. W. Ogilvie became sole proprietor, and he now controls the business of the five mills.

MESSRS. NICHOLLS & HOWLAND, Toronto, announce in our advertising pages that, having secured the Canadian patent right for the Batten balcony fire escapes, and that they are the sole manufacturers thereof in Canada. The advantages claimed for this escape are: The balconies are made of the best wrought iron, of any ornamental design or pattern, and securely bolted through the wall; it can be made any length or width; the brackets and flooring are capable of bearing any number of persons who can assemble on them; the ladders, which have wide steps and are of easy grade, can remain down permanently, or folded up, as desired, showing the ornamental balcony only in sight, thereby not marring the architectural beauty of the building, and can be instantly released when desired; no ice or snow will remain on the steps, neither will the working parts rust, and the apparatus will work admirably in any weather. A stand pipe is also connected for high buildings, with valves at each floor and at the roof. These escapes have been fully tested at fires, proving themselves invaluable for saving life and property. Iron guards on windows of asylums, reform schools, etc., can be adjusted so as to be instantly released in case of fire by the unfolding of the ladder.

THE Dominion Dyewood and Chemical Company, Toronto, of which Messrs. John Taylor & Co. are proprietors, call attention to some of the new dye stuffs handled by them. Among these they mention:—Indigo Extract Powder, a new color which has just been brought out by Messrs. Read, Holliday & Sons, of Huddersfield, England. It is not an aniline color, but a pure form of extract of indigo in a powder, and has the advantage over pasté of being always uniform and much more convenient for the dyer to use, and, besides, coming a little cheaper than the paste. Gambine is a new patented product, the sale of which is increasing rapidly in England. It is said to be the fastest coloring matter for browns and olives yet discovered, and very useful for tweed manufacturers. Read, Holliday & Sons are the patentees and only manufacturers. Auroline is a new red just introduced by Read, Holliday & Sons, and is claimed to be faster to light than benzo-purpurine, and will resist acids and alkalis. It will no doubt take the place of alizarine in many cases. Benzo-black-blue.—This color has just been placed on the market by Farbenfabriken, Vorm, Friedr, Bayer & Co. It gives a good, full, deep blue, perfectly fast to light, soap and acid, and a good black can be produced on cotton by first dyeing with benzo-black-blue, then running through sumach and iron. In common with Benzo-azurine and a little chrysamine, indigo shades can be produced. Acid Phloxine.—This color has just been placed on the market by Farbenfabriken. It gives a very bright pink on wool in one bath, which is perfectly fast to light, and on this account is very suitable for blanket headings. Azo eosine gives the same shade as an ordinary eosine, is dyed similar to ordinary wool scarlet, and is perfectly fast. In combination with a little yellow N., a very bright and fast scarlet can be produced in one bath. Logwood Extract F.—This extract has just been placed on the market by Messrs. Mucklow & Co., of Bury, England. It is made from the pure logwood and the resinous matter afterwards extracted. It can be used on wool in place of chips, producing the same results. On this account this extract is very useful to dyers, and it saves time and the labor of boiling chips, while precisely the same effects are given in dyeing. With the present high price of logwood chips, every economical dyer should give this extract a trial. For further information concerning these stuffs apply to the Dominion Dyewood and Chemical Company, who are sole agents in Canada for the above-mentioned firms.

FAMOUS TOP RETURN FLUE FURNACE.

IN THREE SIZES. FOR BRICK OR PORTABLE SETTING.



WITH EITHER CAST IRON OR STEEL RADIATOR.

Unequaled for economy of fuel, simplicity of construction, ease of management and heating capacity.

NEW GEM

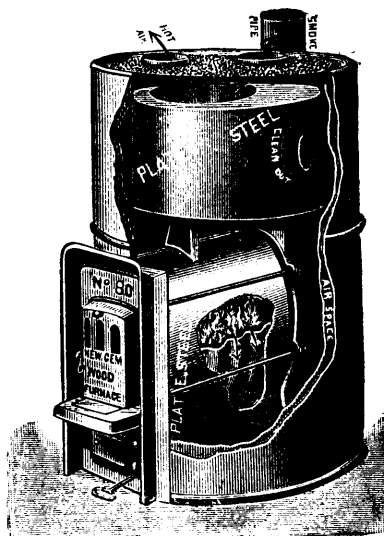
Wood Furnace

Entirely new and of novel design.

A Powerful and Economical Heater.

Thoroughly tested. Specially adapted for medium sized dwellings.

SURE TO SELL



Any dealer who has not received our price list for 1888 will please advise us.

McClary Mf'g Co.

London, Toronto, Montreal and Winnipeg.

TO MANUFACTURERS!

A splendid opportunity to lease, with the privilege of purchasing on very favorable terms, one of the

BEST EQUIPPED FACTORY BUILDINGS IN CANADA.



Having 33,000 feet of floor surface; well lighted; heated by direct steam; has highly economical steam plant, consisting of 150 horse-power Brown Automatic Cut-off Engine with two Horizontal Tubular Boilers of 80 horse-power each, with Heaters, Pumps, Injectors, etc., situated in one of the best manufacturing towns in Canada, and possessing valuable privileges from the town that can be transferred to the lessee or purchaser.

We solicit correspondence and inspection of the property, possession of which can be given at short notice. Address

THE CANADA SCREW CO.

HAMILTON ONT

BARREL • TRUCK

FOR MOVING BARRELS WITH HEADS IN OR OUT.

WILL CARRY FROM 700 LB. BARRELS DOWN TO A NAIL KEG. (WILSON'S PATENT. 1887.)



These Trucks are now ready for the market. Nothing to equal them for the purpose designed. Send order early.

Read the following Testimonial for the first Truck purchased from the Inventor.

Office of THE MORSE SOAP CO'Y.

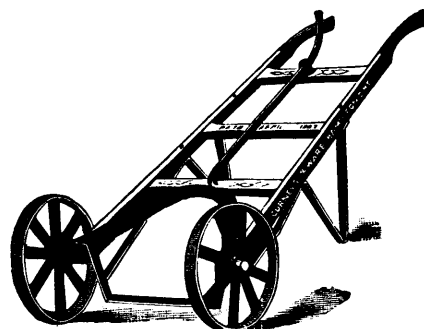
JOHN TAYLOR & Co., Proprietors.

TORONTO, April 25th, 1887.

We have pleasure in saying, that the Barrel Truck we bought from Georgr Wilson, for moving liquids unheaded is quite a success, and has already saved us much labor and material, on account of its convenience.

Respectfully,

[Signed], MORSE SOAP CO



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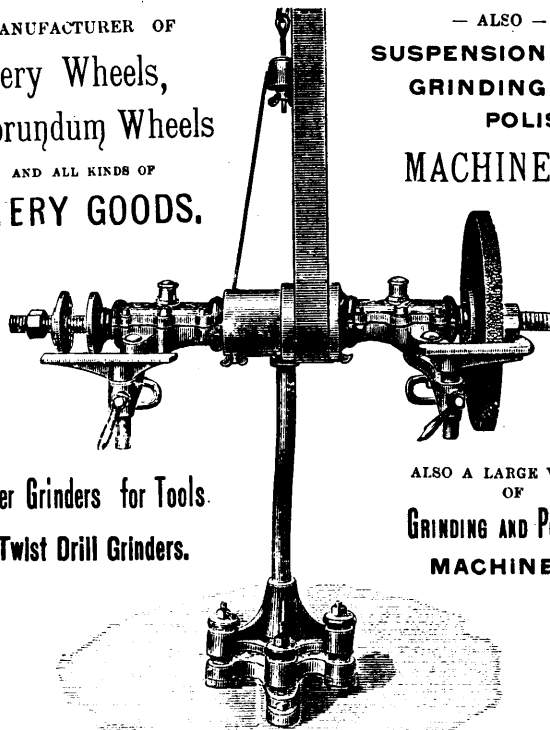
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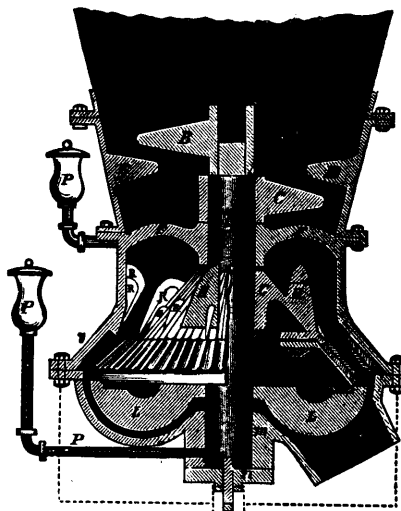
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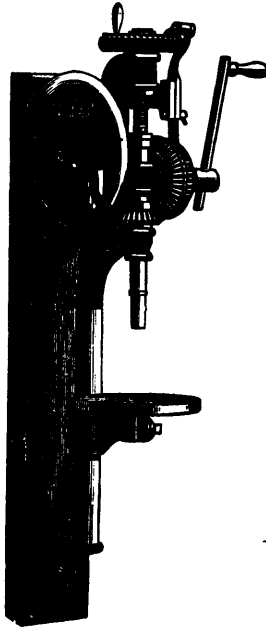
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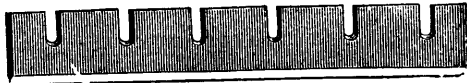
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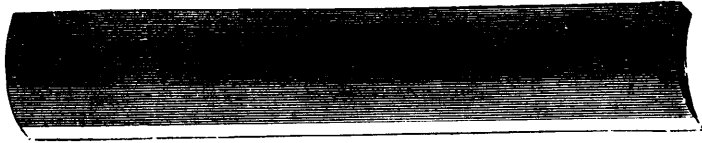
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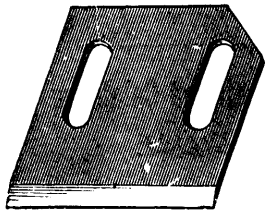
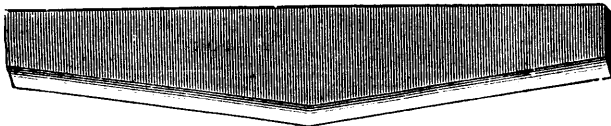
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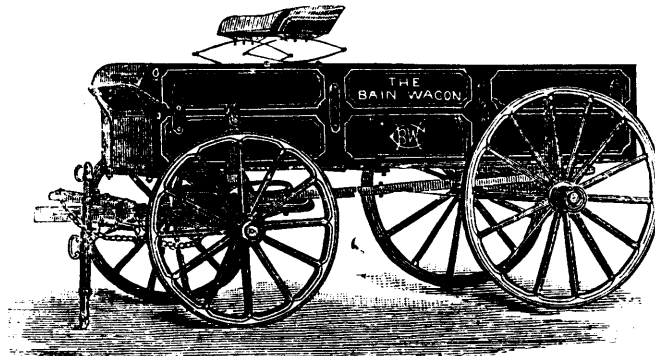
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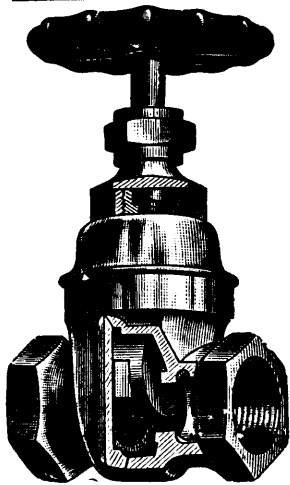
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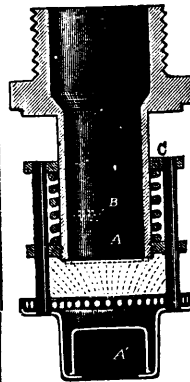
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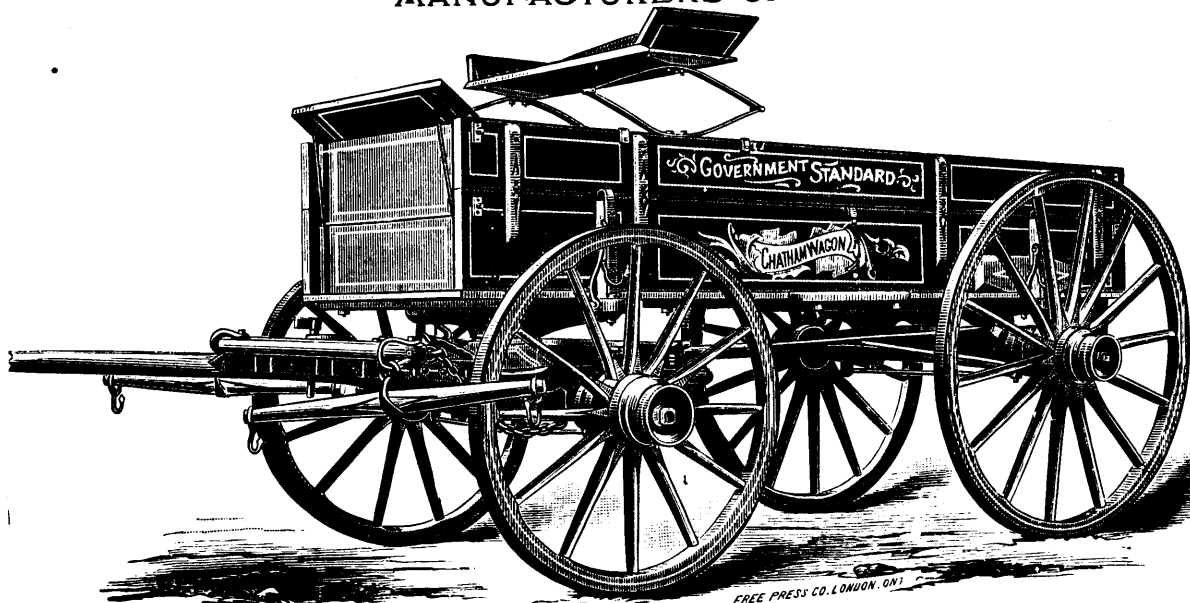
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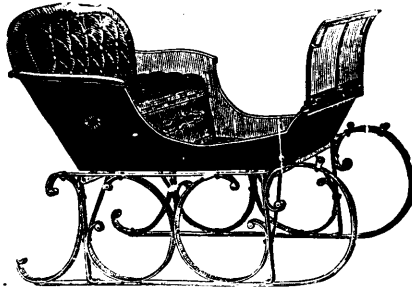
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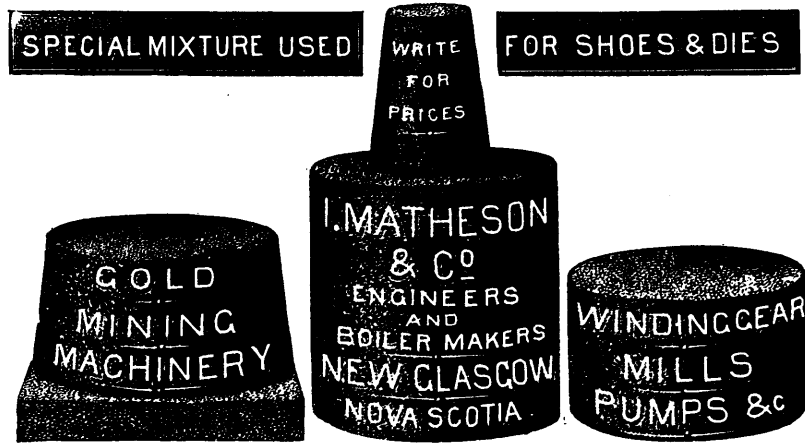
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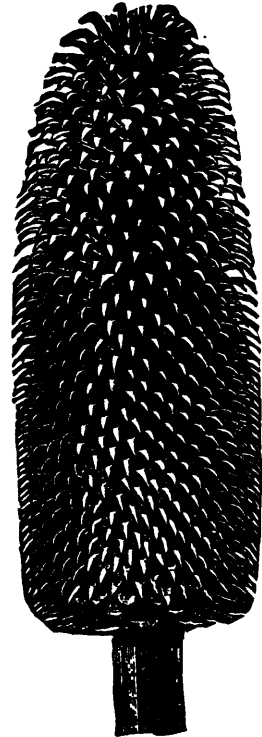
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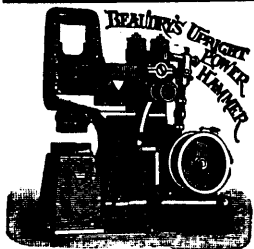
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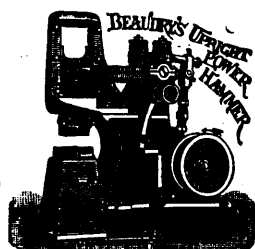
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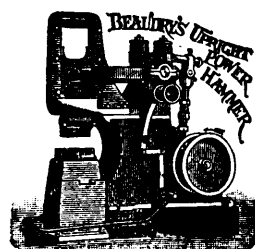
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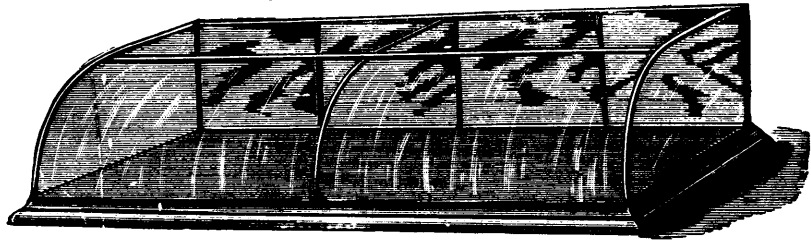
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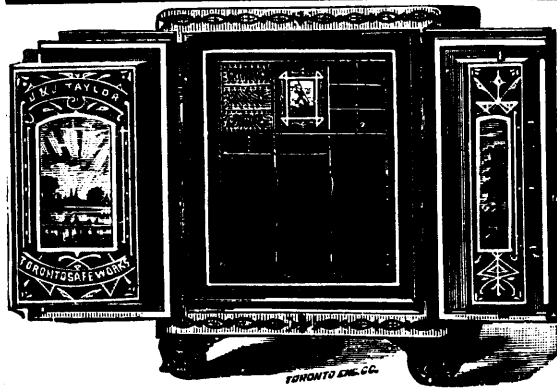
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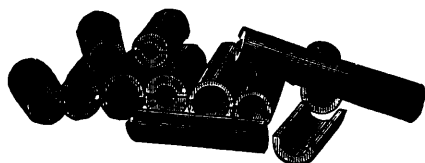
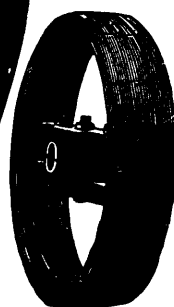
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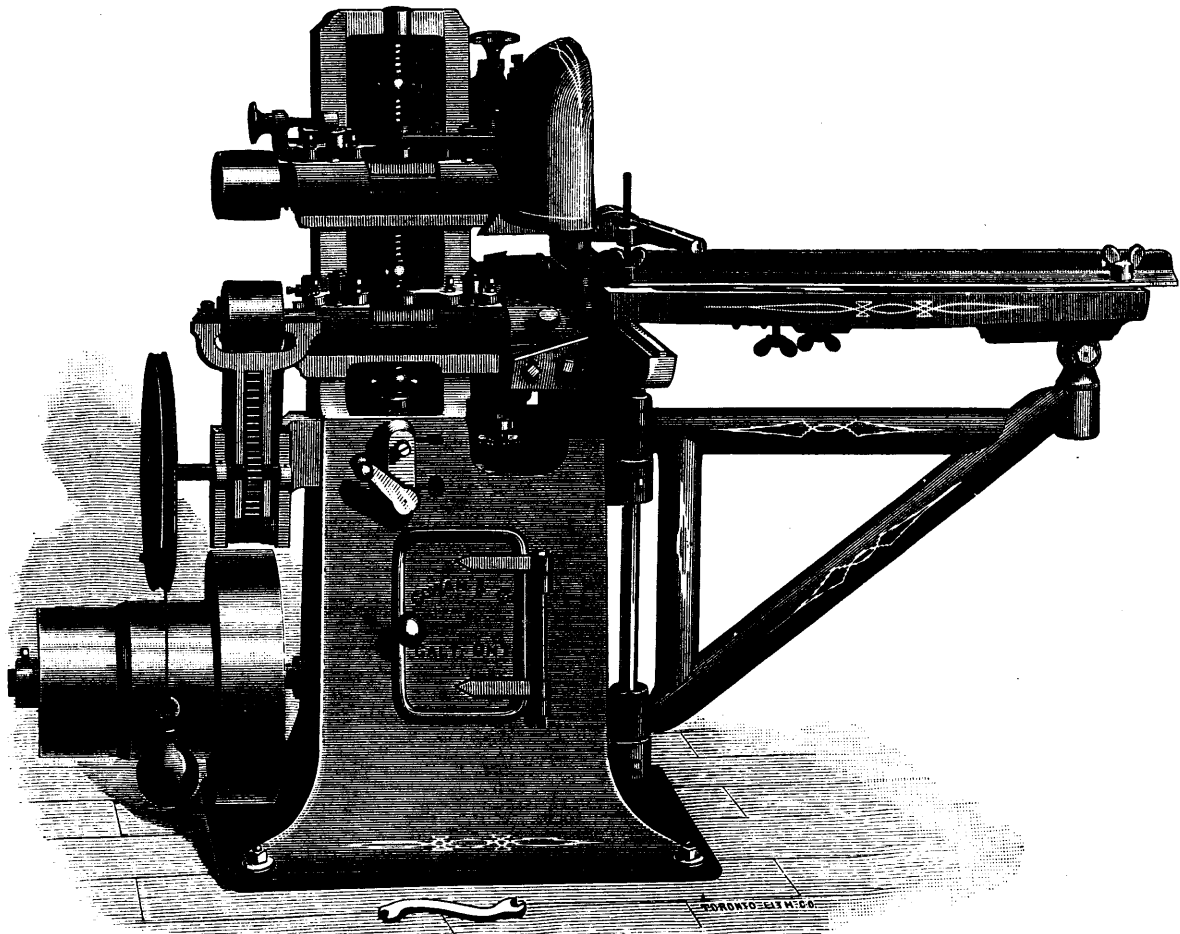
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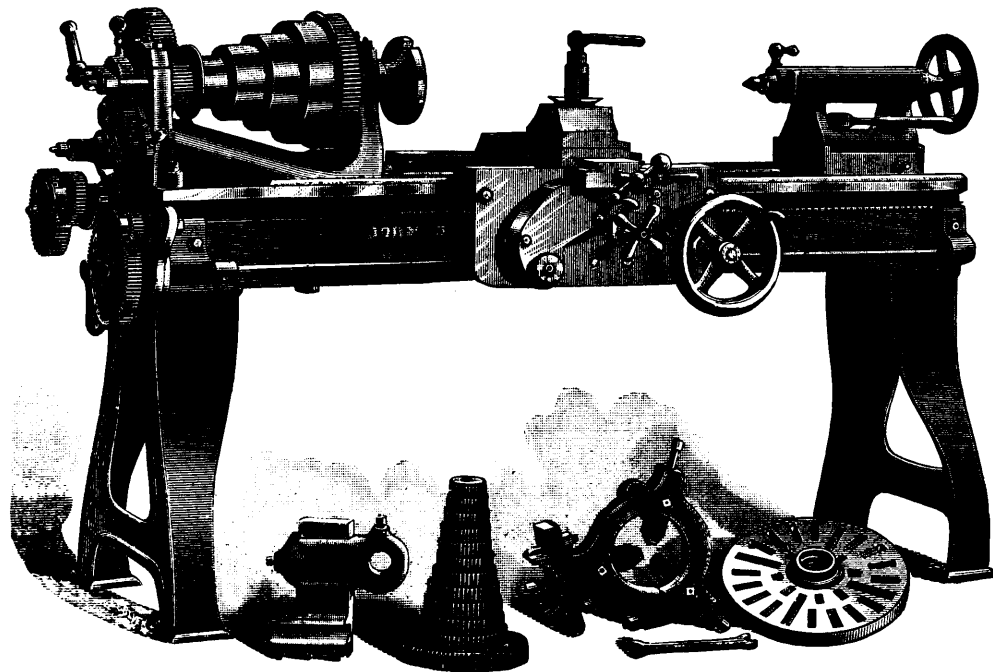
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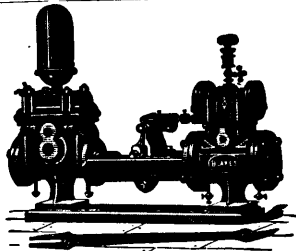
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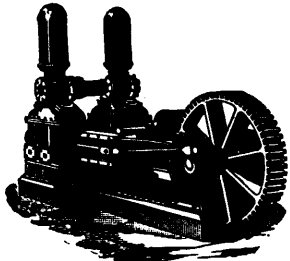
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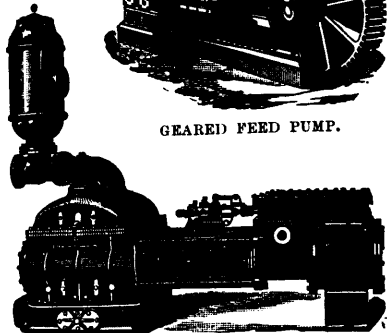
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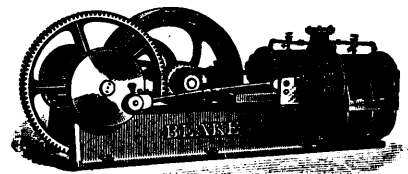


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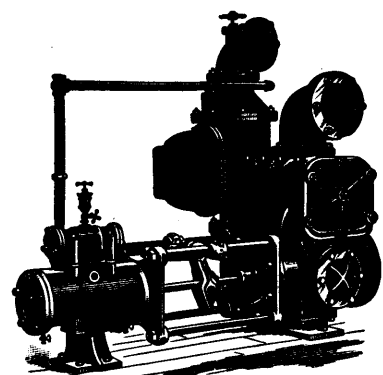
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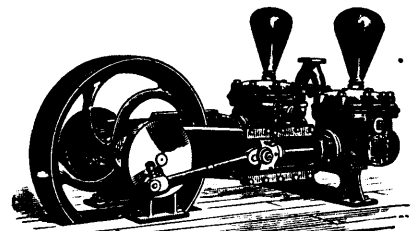
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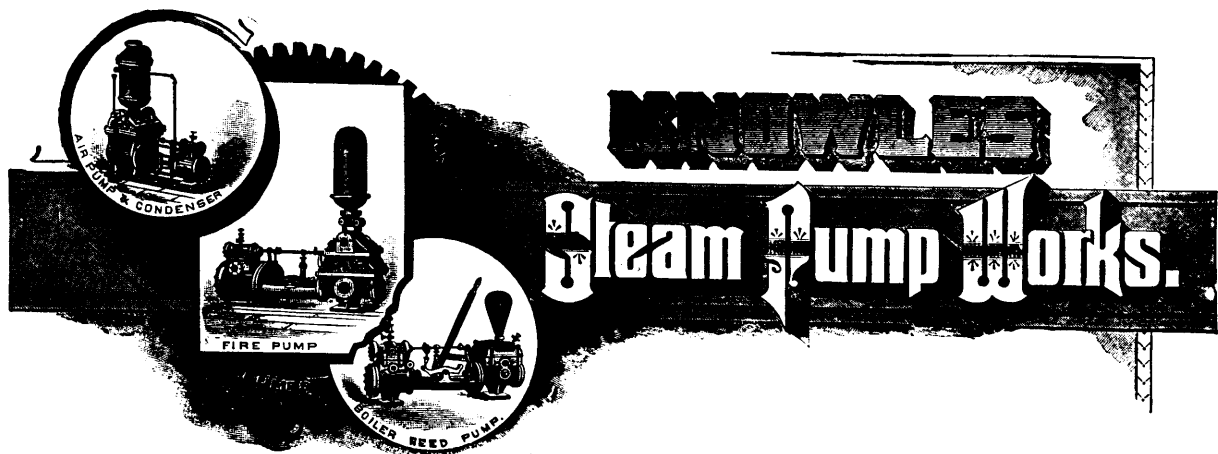
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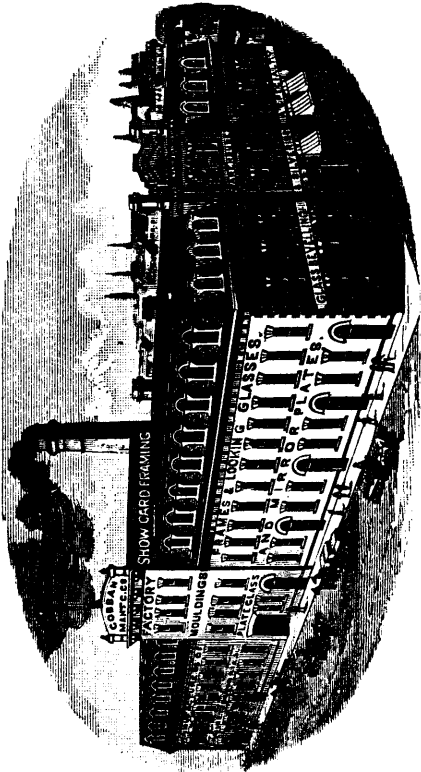
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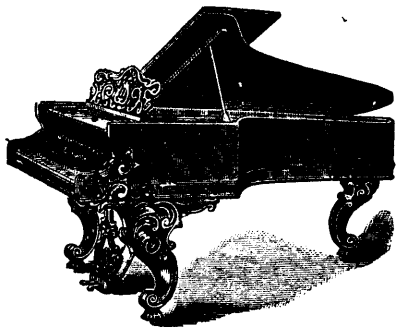
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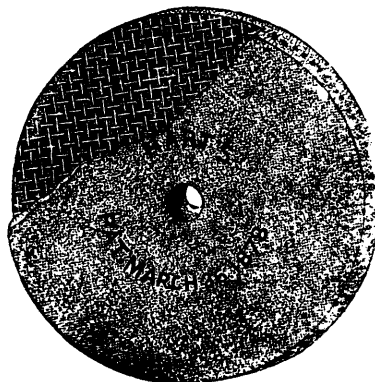
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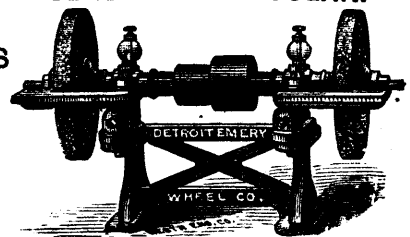
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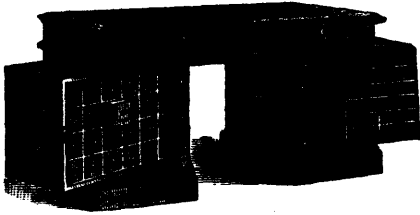
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