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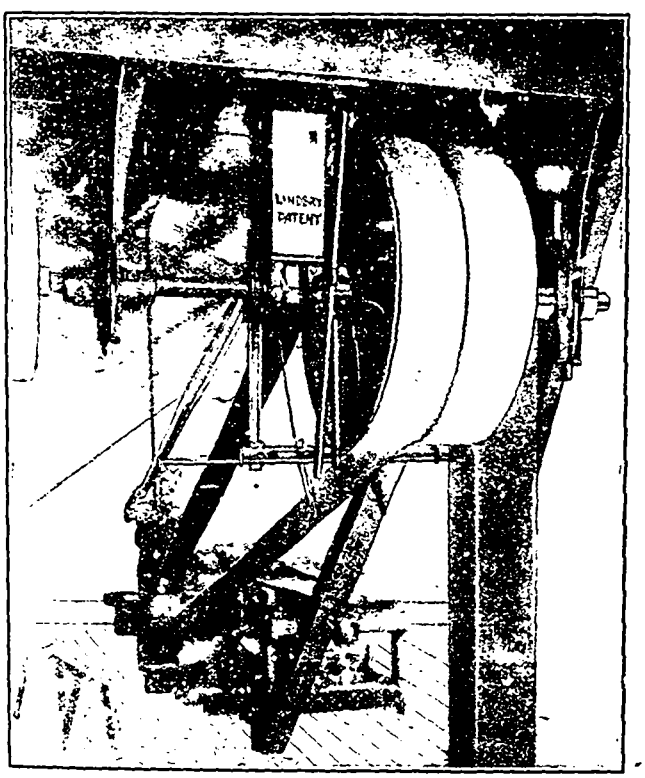

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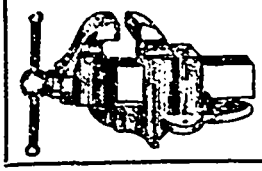

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"Captains of Industry" Who are Building Up Canada

1. Salient Facts in the Career of George F. Haworth, Toronto.

"Opportunity: Is it not often a question of opportunity? Many men have not been able to do large things because the opportunity to exercise their best talents has never presented itself to them."

Thus spoke Mr. Geo. F. Haworth of the firm of Sadler & Haworth, leather belting manufacturers of Montreal and Toronto.

Several of his hearers knew of some incidents in Mr. Haworth's career, however, and one of them remarked: "These men should not have waited for the opportunities, they should have forced the issue like yourself when you started in business, and taken advantage of the opportunity."

Mr. Haworth's father, the late Mr. Thomas Haworth, was one of the pioneer wholesale hardware merchants of old Upper Canada, and carried on business in Toronto from 1835 to 1868.

Naturally, the son started his business training in a hardware store. In those days nail supplies were one of the important features of the heavy hardware business and it was essential for the ambitious hardware clerk to make himself familiar with the use of the different kinds of belting required for the transmission of power. After five years training in the hardware business, two of which were with one of the largest hardware firms in the city of New York, Mr. Haworth returned to his native city and became the travelling salesman for a Montreal leather belting manufacturer. After being in this position for a few years and building up a good and permanent connection for himself as well as for the firm he represented, who ultimately retired from business, the conviction grew upon him that if it was possible for him to make money for others he could do so for himself. The result was a decision to commence business upon his own account. Being as aggressive as he was optimistic, he did not wait till opportunity presented itself, but forced the issue.

Where some men would have seen defeat, Mr. Haworth predicted nothing but success, and was without capital, save in the qualities he possessed as a result of the rigid training he was subject to in his father's hardware business, his trade connection, his tenacity for holding on, his willingness to work and the highest testimonials.

He had but little, yet with this little, in the year 1876 he approached one of the largest manufacturers of leather belting in the Eastern States, a firm by the name of H. L. Fairbrother & Co., of Pawtucket, R.I., with a proposition to give him the sole agency for the sale of their product in Canada and to supply him with sufficient stock to carry on business. He opened correspondence with this firm and later on paid them a visit.

As the suggestion of commencing business entailed the paying out of several thousand dollars for duties, freight and expenses, he explained to them his proposition and stated that in order to carry out his plans he would require to be furnished with sufficient stock, and, in addition to this, would require a line of credit to the amount of ten thousand dollars.

This unusual proposition from a young man without capital somewhat amused the principal of the firm whom he approached. However, upon going into further details and fully looking into the credentials, which the young fellow had armed himself with, the firm finally decided that they could trust their goods and money in the hands of this very persistent young "Canuck," and finally accepted his proposition and gave him the sole agency with ample stocks and credit.

His connection with this firm, which continued for nearly ten years, terminated in the fall of 1885, owing to the introduction of the National Policy with its increased customs duties. Mr. Haworth was compelled to most reluctantly discontinue the association but such step was absolutely necessary for the reason that it became impossible to import to advantage.

This change somewhat disturbed his business and what appeared, at the time, to be a set-back, proved to be an exceedingly good "turn of the wheel," for instead of defeat, he saw an opportunity to become one of Canada's "captains of industry." To reach this point, however, necessitated considerable forethought, for, in the first place, he had to seek for a suitable tanner to supply the proper kind of leather required in the manufacture of belting. Having succeeded in doing so, he immediately set to work fitting up in Toronto one of the most modern and well equipped factories for the manufacture of leather belting in Canada. Here he carried on the manufacturing business for upwards of ten years, when the big "Globe" fire completely destroyed his building and plant.

Mr. George F. Haworth, of Sadler & Haworth, Montreal and Toronto.

Once again seeming disaster was turned to advantage, for out of destruction by fire an opportunity presented itself to amalgamate his business with that of Mr. George W. Sadler, of Montreal, the largest manufacturer of leather belting in Canada. Negotiations were entered into in January, 1895, which resulted in the formation and establishment of the present firm of Sadler & Haworth.

From the start of this combination the result has proven to be most effective, for the present firm now own and control what is claimed to be, the largest and most thoroughly well equipped factory for the manufacture of leather belting in this country. Great strides have been made in the manufacture of this line of goods during the past decade, and so extensive has this firm's business grown that they found it necessary a few years ago, to enlarge their already extensive tannery and belt factory and now enjoy the reputation of making the highest grade of belting that good hides, good leather and skilled workmanship can produce.

Taking Mr. Haworth's career for an example, is there not a lesson here for many young men who are waiting the opportunity?

Transportation in the Iron Foundry.

AN EXAMINATION OF THE PROBLEM OF HANDLING MATERIALS AND PRESENTATION OF SOME PLANS FOR KEEPING THINGS MOVING.

BY OSCAR E. PERRIGO IN CASTINGS.

In the economical and profit-producing management of a manufacturing plant every legitimate means should be employed to eliminate wastes of time and material, since the commercial success of manufacturing operations will depend to a very considerable degree on the extent to which this saving is carried. The waste of material is a matter that is comparatively easy to follow up, to properly account for, and to check. The loss of time and its attendant expenses is quite a different and more complicated problem. Its effects must be sought in several directions. First, the pay of the man for the time lost. Second, the expense of the machine-time lost. Third, the added amount for overhead charges due to the time lost. Fourth, the damage due to the delay in the work.

While it is not proposed at this time to discuss this question, however interesting such an investigation might be, it seems proper to refer to this matter of lost time, as coming within the scope of the present discussion, as we shall see. It is an easily demonstrated fact that in manufacturing operations the time required to handle the material in process is frequently greater than the actual time consumed in the machining operation. This shows the necessity of a thorough study of the processes of transporting and handling the material.

HANDLING MATERIALS.

A careful computation in most manufacturing establishments will show that the foundry handles a greater weight of materials than all other departments combined. While the machine shop handles not only the castings from the foundry but also forgings, bar stock, sheet stock and numerous classes of small material, the foundry handles the same castings, and the other items are more than balanced by the quantities of coke, coal, sand and similar materials to be taken into daily account. Therefore, the transportation problem is, if possible, a more important question in the foundry than in the machine shop where so much attention has recently been devoted to it.

CONVEYING APPARATUS.

The enormous importance of this transportation problem is also strikingly illustrated in the large and rapid increase of conveying facilities that have been designed and built in the last few years. We have numerous designs of shop tracks and cars, propelled by hand and by electric motors, travelling cranes, overhead trolleys, and hoists operated by hand, compressed air and electricity; stationary jib cranes, travelling jib cranes, portable jib cranes, hand trucks, and so on, in addition to the large number of devices of the conveyor type for rapidly and economically moving a great variety of materials suited to this method of transportation; and their number and variety is still increasing. The transportation facilities that would have been deemed adequate even ten years ago would not be tolerated a moment in the up-to-date plant at the present time. Not only is great attention given to the transportation facilities between the different departments of the shops, but between the various buildings of the plant.

THE LAYOUT OF BUILDINGS.

In the designing and laying out of the buildings of a new plant it is now customary to carefully study transportation and arrange the different buildings of the plant to render the facilities for this purpose the most comprehensive and efficient and at the same time economical in their first cost, subsequent operation and maintenance.

This method of procedure in laying out a plant was used to only a comparatively limited extent up to quite recent years. Fig. 1 shows the plan of a plant built ten or twelve years ago, and is an example of a lack of proper study and consideration in this respect. No particular reason existed for the awkward location and arrangement of the foundry buildings. Yet no attempt seems to have been made at providing proper yard transportation; and with the exception of a short line of overhead trolley for moving ladles of molten iron, and an old-fashioned foundry jib crane, there was no system of shop transportation beyond a horse and tip-cart and the use of wheelbarrows.

OUT-OF-DATE METHODS.

In a general way the buildings of the plant cover too much ground and are very poorly arranged in their relation to each other for economical manufacturing. A railroad siding offers excellent facilities for bringing material and supplies to the plant, as well as for shipping the product. But the advantages that might have been gained by this condition were in a great measure lost, this track running only to the coke storage bins as shown. In consequence of this condition, pig iron, coal, sand and other foundry supplies were unloaded from railroad cars at A into carts and hauled to their several places of storage. Pig iron, coke and coal for use in the foundry were all brought in on wheelbarrows. Most of the castings were taken in a cart from the foundry floor to the cleaning room. Such as were too large for this method were carried on a heavy four-wheeled truck drawn by horses. Many small castings were carried in wheelbarrows. Similar means were used in carrying the castings from the cleaning room to the machine shop. Patterns were brought from the pattern storage to the foundry and returned there after using, on a truck drawn by hand. This condition of things necessitated an unusually large force of labor and the consequent expense, in addition to the cost of horses and carts and their maintenance.

Fig. 2 shows the same plant with adequate system of transportation installed. The railroad track leading to the coke bins remains and from it a branch track is carried around to the left for the purpose of delivering

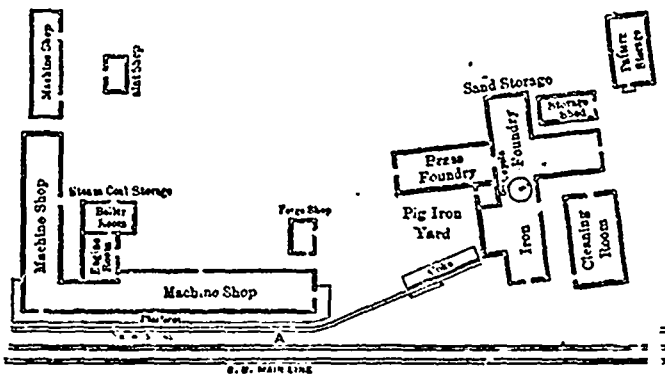


FIG. 1. TRANSPORTATION IN THE PLANT AS ORIGINALLY ARRANGED.

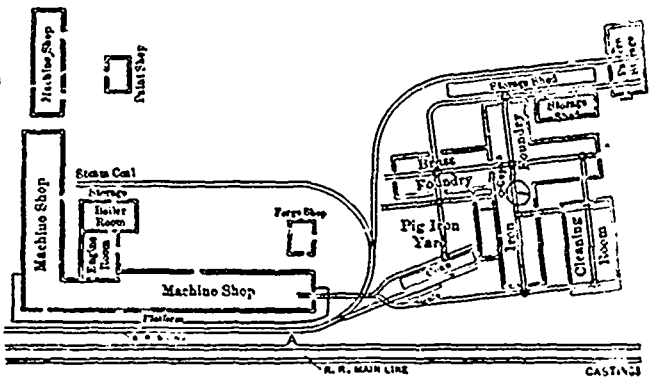


FIG. 2. TRANSPORTATION IN THE PLANT AS REVISED AND ELABORATED.

steam coal instead of hauling it in carts from A. as formerly. A branch from this track is carried past the brass foundry, around to the wood storage sheds and on to the pattern storage building. This makes ample provision for bringing in materials and supplies and delivering them at the points required without the necessity of a second handling, or the employment of horses and carts.

A complete system of shop tracks connects all departments of the foundry and its yards, by which patterns, flasks, supplies of pig iron, coke, coal, sand, clay and similar materials are brought from the yard or storage sheds directly to the point where they are used. Castings are carried to the cleaning-room and from there to the machine shop, always on suitably constructed cars running upon smooth iron track, conveniently arranged with turntables at each crossing, whereby the shortest and most direct route can always be taken and there are no delays from blockades even if other cars are in use on the same lines of track. These points and their important advantages will be quite apparent by a little study of the plan, and it will be seen that although the original arrangement of the buildings left much to be desired, yet the transportation system as laid out obviates many of the original disadvantages.

A NEW FOUNDRY.

Fig. 3 is the plan of a newly designed foundry intended for a general line of work and not as a department of a manufacturing plant. Hence the arrangement is a complete set of buildings including not only the foundry proper with its usual departments, but offices, pattern shop and power house.

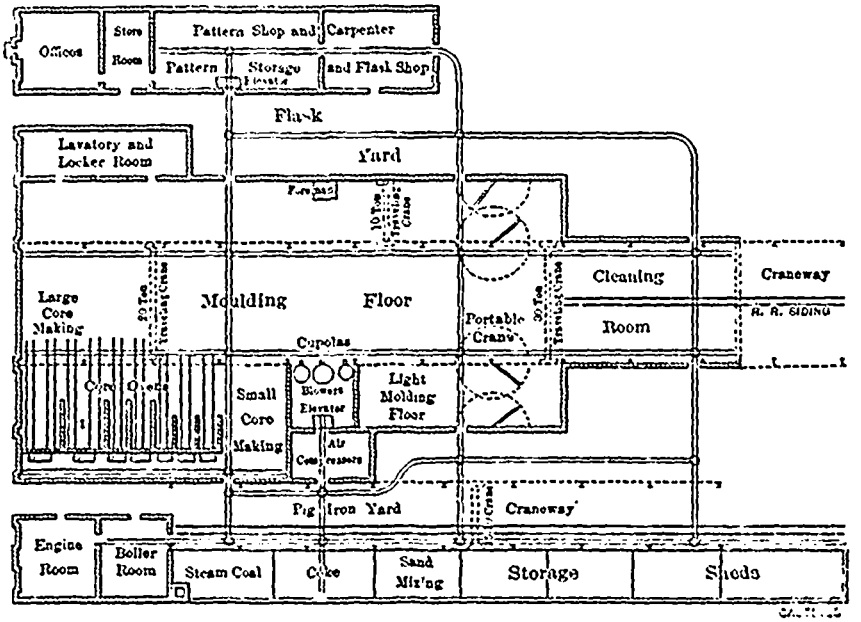
The main building is 150 by 325 feet, and has at the front end an extension of 50 feet on one side for the accommodation of the core-room, core-ovens, charging floor, etc., and on the opposite side for the lavatory and locker-room. At the rear is another extension 75 by 100 feet for the cleaning-room. On the side of the lavatory and 20 feet from it is the office building 50 by 300 feet and of two floors. The offices occupy the first 50 feet from the front on the first floor, with the drafting room on the second floor. The next 25 feet is the store-room for small foundry supplies on the first floor. Adjoining this is the pattern shop, occupying 125 feet. Beyond this is the carpenter and flask shop, 100 feet. The second floor over the store-room, pattern shop and carpenter shop is devoted to pattern storage, its length being 250 feet. An elevator passing up from the pattern shop furnishes ready means of sending patterns up and down. On the opposite side of the main building is the power house, 50 by 90 feet. Continuing on the same side line to the rear are storage sheds, 30 feet wide and 400 feet long.

The central space of the main building is used for large and heavy work, whether moulded in green or dry sand or loam. The bay on the side next to the office building is used for a medium class of work, and the space to the right of the cupolas for light moulding that can be done on benches. There are three cupolas located at the centre of the side next to the storage sheds and the pig iron yard. To the left of these is the space for making small cores, and from this space to the front wall of the building are the core-ovens. These are three small, single-track ovens 12 by 20 feet; two single-track ovens, 12 by 30 feet; and two double-track ovens, 25 by 30 feet.

Over these ovens is a gallery extending from the front of the building to the cupola wall, upon which are shelves for storing cores. The heat of the core-ovens below greatly facilitates the keeping of these cores in proper condition for use when wanted. This gallery has a track through its entire length, and a short transverse track connecting with that and running out under the main traveling crane, by which means empty or loaded cars may be raised from or lowered to the tracks on the foundry floor. The tracks from the core-ovens extend past the inner line of columns so that the travelling crane may be used in handling large cores from the cars on them.

Between the main building and the carpenter shop is an ample yard for the storage of such flasks as are too bulky to be kept under cover. On the opposite side of the main building, and between it and the storage sheds, is the yard for storing pipe and scrap iron.

The charging floor of the cupolas is within the line of the main building and charging



PLAN OF FOUNDRY WITH COMPLETE TRANSPORTATION FACILITIES.

materials are taken up to it on an elevator as shown. The space under the charging floor is used for the blowers. Outside of this space and under the extension roof is the room for the air compressors.

The main building is constructed with a high central portion, 70 feet wide, and side sections or bays each 40 feet wide. The central space is covered by one 30-ton and one 20-ton travelling crane. The runway for these cranes passes through the cleaning-room and extends about 60 feet out into the yard. On the side opposite the cupolas is a 10-ton travelling crane running the entire length of the building. Between the main building and the storage sheds is a craneway, 325 feet long, upon which is a 15-ton travelling crane. In addition to these travelling cranes, there are four portable jib cranes, arranged so as to be moved from one column to another as required, by means of one of the travelling cranes.

Two railroad tracks come into the plant; one enters the cleaning-room, running its entire length, and the other passes along in front of the storage sheds, under the 15-ton crane. This latter track is principally used to bring material and supplies into the plant, while the track entering the cleaning-room is more particularly useful for shipping. If this foundry were one of the departments of a manufacturing plant a greater portion of castings would be sent to the machine shop by way of the shop tracks passing through the foundry.

Two lines of shop track run through the entire length of the main building, and the cleaning-room, being located just inside the line of columns of the main buildings. These are designed particularly for moving the castings to the cleaning-room, but in connection with the cross tracks are useful in carrying the smaller cores from the core-ovens to any part of the floor.

A track passes through the center of the pattern shop, and on through the carpenter shop, beyond which it curves toward the main building, passes through the flask yard, entirely across the main building and the pig iron storage yard, terminating in a connection with a similar track running the entire length of the storage sheds and into the boiler-room. In the pattern storage room, on the second floor, is a track running its entire length and connecting with a short track at right angles and leading to the elevator. Connecting with the longitudinal track in the pattern shop is a similar track crossing the elevator, running across the flask yard, on through the main building, and across the pig iron storage yard to the track in front of the storage sheds. By means of this combination of tracks, patterns and flasks are readily conveyed to and from the foundry. The portions of them that come within the foundry proper are also in connection with the longitudinal tracks used in carrying castings to the cleaning-room, while the one passing through the coremaking department connects with a short line passing the core-oven furnaces by means of which coal is conveniently distributed to them.

Another cross track runs from the coke

storage shed across the pig iron storage and on to the elevator to the charging floor. As this must furnish transportation for all the charging material it should consist of a double track with suitable connections at each end so that loaded cars may run in on one track and empty cars be returned on the other. This will be all the more necessary if two out of the three cupolas are generally used, and will be a labor-saving convenience in any event. Connected with this cross track is a longitudinal track passing through the pig iron storage yard and continued to the cross track which commences at the storage shed track, runs through the cleaning-room, and curves to the front, passing through the flask storage yard and connects with the two cross tracks already described.

It will be noticed that in the system of shop tracks there are very few curves and no switches. Switches, of course necessitate curves and occupy too much valuable space on the foundry floor. The turntable economizes space, is quickly worked and costs no more than the switches necessary to accomplish the same results. Switches are more liable to become clogged and troublesome than turntables. The same conditions exist in yard tracks. In the case of double tracks as suggested for those serving the charging floor, they are readily connected with each other at the end, and with a cross track by means of a single turntable, with its track grooves formed at right angles as usual. The same arrangement may be made on the charging platform, one turntable uniting the two tracks coming in from the elevator and the three tracks running to the cupolas.

By the transportation system here illustrated and described, all points of supply for the foundry are connected by one or more tracks, reaching any desired point on the floor by very direct lines. Material is readily transferred from one point to another of the foundry floor. By means of the portable jib cranes, any point on the floor requiring unusual hoisting facilities can be abundantly and quickly supplied. Compressed air is piped to a sufficient number of points to be available for air hoists on any part of the floor.

The railway track passing through the pig iron storage yard may be elevated and placed close to the storage sheds so that the contents of the cars may be dumped directly into them. In this case the yard track for shop cars could be located beneath the railway track, and also close to the storage sheds for convenience in taking material from them.

For handling light ladles of molten metal the overhead trolley system is convenient and rapid and should be installed where much of this work is to be done. A line should run from in front of the cupolas to the light molding floor and the entire length of it. Another line will be convenient in the cleaning-room, extending over the pickling beds and shop tracks, and equipped with air hoists.

According to W. H. Aldridge, consulting mining engineer, the Canadian Pacific Railway will commence producing coal from its Crow's Nest lands next year. Development work is being carried on at Hosmer, B.C., under the style of the Hosmer Mines, Limited.

Brazing Large Alligator Shears.

An interesting as well as difficult brazing job was completed a short time ago by the Dynamic Machine Works, Dalhousie Street, Montreal, which illustrates the possibilities of their process of brazing cast iron.

A large alligator shears, part of the plant of London Rolling Mills had broken down whilst performing some extra heavy work. An attempt was made to repair the shears by means of straps but was found to be very unsatisfactory owing to the fact that the heavy strain caused the fractured portions to spring. Hearing that the Dynamic Machine Works undertake the brazing of cast iron and guarantee the strength of their joints they communicated with them with the result that the shears were shipped to Montreal.

FIG. 1. BRAZING ALLIGATOR SHEARS.

As will be seen from the illustrations the job undertaken was no light one. Both extensions carrying the gear boxes were fractured and each portion weighed between 400 and 500 pounds.

The first difficulty encountered lay in the fact that the joint being an old one had worked together when patched, with the result that it would not close by one eighth of an inch which necessitated the whole surfaces being chipped clean and straight. This was done and a good fit obtained. It was found advisable to undertake this work outdoors, and in spite of the fact that the shears weighed over five tons it was handled without much difficulty. The pipes connected to the blower and gas tank were extended outdoors and the job set up there. The machine was turned on its side and the broken portion brought into position, held in place by means of a jack and the heat applied. In about five hours a sufficient heat was obtained and the actual work of brazing commenced, which was completed in about two hours. The shears were then turned over and the other leg brazed in a similar manner. The work was satisfactory in every way and the shears, as far as that particular work was concerned, were as good as new.

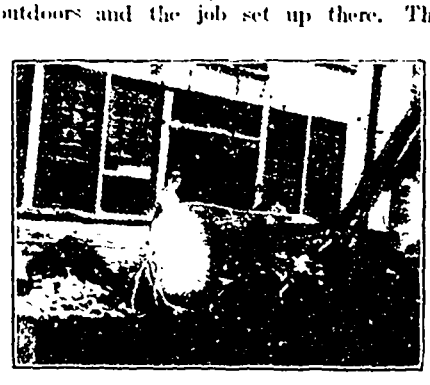


FIG 2. BRAZING ALLIGATOR SHEARS.

This is the first time a job of this magnitude has been attempted in Canada and the results proved extremely satisfying to those concerned. The Dynamic Machine Works own the sole rights of this process in Montreal and district, and now number against their customers practically all the leading firms in Montreal, as well as customers outside that city.

IMITATION CHAMOIS LEATHER.

Sheepskins that have been damaged on the grain may be finished on the flesh side. If a good, smooth surface is wanted, the skin must first be brushed over with a colorless solution to which 200 grams of flour are added for each litre of liquid. When this is dry the skin is glassed on a machine.

To finish in imitation of chamois, the skins are dipped for five minutes in a solution of 2 grams bichromate of potash to a litre of cold water, after which they are washed in a drum and then colored. Only basic dyes should be used, and all others rejected. After dyeing, the skins are washed, stretched and fat-liquored and then quickly dried. When fully dry, they are rubbed off with pumice-stone, to remove all unevenness and are then given a second coat of the coloring, which may be the same as used for coloring the grain, viz., red, yellow, orange, black etc. To give the skin the appearance of chamois, rub well again with a fine grained pumice-stone.

AN ESTIMATE OF ONTARIO LUMBER CUT.

The following report on the lumber situation in Ontario has been made by U.S. Consul Wakefield, of Orillia.

The most recent estimates of the pine cut in Ontario received by the department of lands, forests, and mines give a total of 675,000,000 feet for the past year. Early in the season the estimates totaled 710,000,000 feet, showing a reduction in the latest estimates of 35,000,000 feet, or about 5 per cent.

Information this consulate has received from various lumbermen is to the effect that not more than four-fifths of last year's cut of logs will be taken out. As many of the operators did not succeed in getting last year's logs to the sawmills the lumber cut this year should be equal to last season's. There is at present little demand for lumber, but as the stocks are in strong hands, prices have not been lowered. Recently signs of improvement in the lumber market have been apparent. The original estimate of railway ties to be cut was 2,500,000. As the Canadian Northern, Grand Trunk Pacific, and Canadian Pacific railways are all obtaining ties in Ontario, the cut will probably exceed 5,000,000 ties.

The pulp wood cut is placed at 216,000 cords.

H. G. Drury & Co., Montreal, have secured the Canadian agency for the Jackson Steel Co.

What Qualities Make a Good Buyer?

THE TRICKY BUYER FOOLS HIMSELF THINKING HE IS FOOLING OTHERS, SAYS AMERICAN SHOEMAKING.

Many people believe that being a good buyer means being a sharp, tricky, unscrupulous bluffer, and a patient dickerer. This kind of a buyer sometimes succeeds in getting an unusual bargain, but he is also the kind that "gets bit" most frequently. He is a very tedious person to every one who has dealings with him and he plays a short-winded game.

He will soon have gone the rounds with his tricks and when every one knows him he will stand no chance at all beside the buyer whose policy has won for him the reputation of being a plain, straightforward man to do business with.

The tricky buyer fools himself by thinking he is fooling others, and the setting of his little traps and trying to keep them covered up takes just so much of his attention and ability away from the main point of the subject. If these buyers only realized that those they are dealing with are often reading them like an open book they would drop all their faking and get down to business.

The salesman often knows and understands a buyer's methods of reasoning and habits in buying better than the buyer does himself. The salesman has all the buyers he meets sorted out and set down on his mental note book under different headings. He knows the man who always has to do just so much dickering anyway, no matter whether he thinks the offer is a bargain or whether he would not buy at any price; and the man who makes a feint of turning and walking away to see if he can't draw out a lower offer and then slowly edges back a step at a time when he sees his game has failed. He knows too the man who can be fooled into paying more than a thing is worth to him, providing he is made to think he is getting a special price that would not be offered to a buyer less shrewd than himself, and the man who asks for prices on goods in extra large amounts and then sends in a microscopic order to be filled at the same price; and the man who likes to think he is getting the best of you when he takes twice as large a percentage of discount as he knows you allow when he pays his bill, and threatens loss of his trade when you object. He has also made the acquaintance of the buyer whose trade is pretty good size and whose actions are proportionately three times as large; who thinks he is exempt from all the ordinary rules of business and the special ones of his dealer by which everyone else is bound; who takes all kinds of unprecedented privileges and slinks for the sake of holding his trade the dealer will stand any kind of treatment he feels like giving him; who expects the earth, but gives nothing in return, and finally throws over the dealer for some trifling thing after tarrying his patience and forbearance to the limit.

All these different types of buyers and many more are very familiar to the salesman and he learns to tell with fair accuracy after a few minutes' talk to which type a buyer belongs, and he sets his trap with the bait that catches that type. If the buyer likes to feel that he has beaten you down in your price the salesman adds a few cents to his price so that the buyer may be humored in his vanity in thinking he knows how to get the best of the other fellow and bring prices down. But there is one kind of a buyer for whom the salesman has no bait, and that is the man who does not dicker, who never wastes his time and that of the other party by keeping up a sparring match, and who has no little tricks or games of any kind. For this kind of a buyer the salesman can set no trap, for the only thing he can calculate on is that if he makes a lower price than anyone else has he will get his trade, which is valuable because he is a steady, satisfactory and profitable customer to the man who treats him the best and gives him the best prices.

His only weapon for defence is the removal of his trade which is feared more than the retaliating tricks of the crook.

The man who makes the best buyer, outside of having a knowledge of shoes and shoemaking, requires first the qualities of straightforwardness and directness in his methods of doing everything.

He should be open to conviction but not influenced by clever talk unless it is logical. He should make it easy for salesmen to see him during as large a portion of his time as possible, and thus get as many people bidding for his trade as he can.

He should make it a point to have it plainly understood by all who try to sell to him, that he trades with whoever saves the firm a dollar by giving better goods at the same price or the same goods at a lower price.

He should go the rounds and get bids from every one, and should go straight at the point without any beating around the bush, saying, "I'm paying such a price. Can you beat it?" If he has not made it his policy to be straight and honest it will be a hindrance to him for no one will believe him when he quotes a price and he cannot get lower bids so often nor so easily. The buyer who either will not tell his price or when he pretends to be telling it is generally lying, merely places himself in a harder position to get what he wants from the salesman, which is bottom prices. If he talks and transacts all his business in a square, "above-board" fashion, he will have a great advantage in getting the lowest quotations of prices, and will be saved a great deal of time by not having to go "all round Robin Hood's barn" to do so. He should never discourage competition by putting off the salesman who offered a lower price without an order until a chance is had to put the price to their regular dealer to see if he will meet it. This is not only unfair to the salesman but it is very bad policy for the firm that practices it, for the firm would still be paying the high price if it were not for the man who offered the first reduction but as he receives no recompense he is not likely to do it a second time.

As may be seen, by this policy a firm is just making the best possible move to make the prices it is paying remain fixed instead of being able to cut them down. Even if the firm's regular dealer were to go still lower in price when quoted the reduction already offered, the first man to cut the price should get the trade to repay him for bringing the other one down. Then later the regular dealer's still lower bid can be taken up without discouraging the competition of the second one.

A firm should always show its appreciation to every one who directly is the means of getting for it better prices and should take up with each bid in the order received.

The buyer should be inquisitive and pump out all the information he can from the salesman's knowledge and experience, and should have a good memory for what he finds out. He soon learns the salesmen who visit him and knows which one generally has the most to give him, and while every man should have an opportunity each time, for he may have something new in materials or information this time even if he did not last the buyer can learn to regulate the amount of time he spends with each according to what he finds is his value as a source of information.

The good buyer never shows an attitude of sufference towards salesmen, or treats them with a superior air merely because he has the advantageous position, for he realizes that they also have something he needs and which they have the power to give or withold as they see fit, and it frequently happens that the information a salesman has is of a great deal more value than the order which the buyer has to place with the salesman.

The foundation qualities of the good buyer are honesty and directness of purpose and of methods. With these he will have the complete confidence of the firm he represents and of all those he buys from, which will enable him to get to the point quicker and go farther, and he will have their friendship as well which will prompt much friendly help in the way of important information, honest advice and square dealing, and he will wear well with everyone.

THE SALESMAN'S CREED.

I believe in the goods I am selling, in the firm I am working for, and in my ability to get "results." I believe that honest goods can be sold to honest men by honest methods. I believe in working, not waiting; in laughing, not weeping; in boosting, not knocking, and in the pleasure of selling goods. I believe that a man gets what he goes after, that one order to-day is worth two orders to-morrow, and that no man is down and-out until he has lost faith in himself. I believe in to-day and the work I am doing, in to-morrow and the work I hope to do, and in the sure reward which the future holds. I believe in courtesy, in kindness, in generosity, in good cheer, in friendship, and honest competition. I believe there is an order somewhere for every man ready to take one. I believe I'm ready ready now! —Ex.

The Montreal Fire Brick and Terra Cotta Works have dissolved and the Montreal Fire Brick Co. registered by Herbert, John E. and William Clayton.

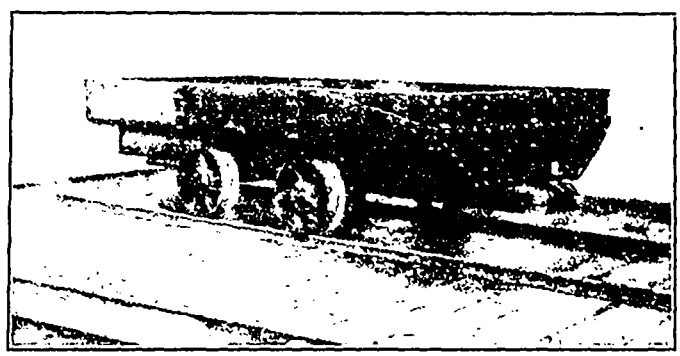
Mr. Chas. H. Mitchell was recently elected president of the Toronto branch of the Canadian Society of Civil Engineers. Mr. T. C. Irving, jr., is secretary, and Messrs. M. J. Haney, J. Simpson and N. McLeod, with Mr. Mitchell, the executive committee.

Mr. S. J. Fox, M.P.P., and ex-president of the Canadian Clay Products Manufacturers' Association, has been re-nominated as candidate for the Ontario Legislature.

All Steel Mine Cars for Coal.

Herewith is given an illustration of a special type of mine car, an order for 200 of which was recently placed with the Arthur Koppel Co., manufacturers of industrial railway equipment, New York, by the New River Pocahontas Consolidated Coal & Coke Co., after thorough test of sample car.

The design of this car is for all steel construction. It is a very low car with large capacity, the overall height from top of rail being only 30 inches with the capacity of 57½ cubic feet. The gauge is 44 inches. The feature in the design is embodied in the round buffer, which is built of a special steel channel having a small depth and very wide flanges. At the ends this channel is bent to a semi-circle and projected beyond the car, so as to give clearance between the corners of the cars on curves. Between the ends this bumper channel is continued clear through the car, making a continuous buffing column capable of carrying from car to car the end shocks met in the service, without transmitting the whole strain to any particular car. This feature is very similar to that used on the standard railroads. The large overhang of the sides, which gives the car its large capacity, has been well stiffened, and its shape composed of large radial corners, facilitates the discharge of the load. The door at one end is of the lift type, and is also well stiffened to give it the necessary rigidity. The wheels, axles and bearings are of a special patented self-oiling type. The wheels are 16 inches in diameter.



All Steel Mine Car.

The service into which these cars are to enter is the general coal mine service, transporting the coal from the workings to the tipple where they are automatically dumped. A special device has been attached to the bottom of the car to catch the dogs on the chain hoist used in hauling at the tipple incline. This car is light, rigid and serviceable, and in view of its low overall height and high capacity, together with its substantial buffers, was considered by the committee which examined the sample car as most suitable for use in all mines where a narrow gauge railroad can be operated.

The Grand Trunk Railway have entered into an agreement with Barrie, Ont., whereby the company is to spend at least $150,000 upon car shops, etc., at Allandale, and to have a fixed assessment of $35,000.

CANADIAN REGULATION OF TRADE.

Sensible Canada, tiring of her shipping decline in the coasting trade, has adopted our plan of granting no privileges to foreign vessels. Originally the idea of opening this trade was to coax us into reciprocating the favor, Canadian vessels to run in our trade from one of our ports to another, and our vessels to run in their trade from one of their ports to another. It was a jug-handled proposition for the benefit of Canada; but some years ago one of our fluent politicians, now no more, was employed to go through all our cities on the lakes advocating this branch of "reciprocity." For a wonder, the scheme failed. Our lake vessel owners sat down hard upon it. But there were other owners in the world that appreciated the offer to reciprocate, and these entered upon the waters of our neighbor and have given him a taste of trade freedom, and all he wants now of that article. Canadian shipping began to fall off briskly as soon as the foreign vessels began to get in their work.

The countries enjoying the coasting privilege in Canada are Norway, Italy, Germany, Netherlands, Sweden, Austria-Hungary, Denmark, Belgium, and the far-away Argentine Republic. Not so very long ago Canada had over 1,000,000 tons of shipping and was fourth in the list of vessel nations. Now it has but little over 500,000 tons, and is the tenth in shipping rank. Norway has gained the place of fourth, that Canada enjoyed, with a net tonnage of 1,500,000, much of it employed in our foreign trade. Norway's own trade amounting to little, her shipping exists on privileges granted by other countries.

An order in council—a remedy unknown to our constitution—has just been passed, withdrawing on and after January 1, 1909, the ruinous privilege now taken advantage of by the vessels of the nations mentioned above, and confining the right to carry freight and passengers from one Canadian port to another to vessels of the British flag alone.

This action of the Canadians should be a lesson to our government. It has just such a work to do, to preserve our marine in foreign trade; that is, to give notice to foreign nations that in a year all privileges to them by conventions will be withdrawn, and after that time the arrivals of their vessels at our ports will be confined to voyages from their own, under penalty of heavy discriminating tonnage duties. Privileges to foreign vessels to come with cargo from any and every port of the world have destroyed our foreign carrying trade. We know this, the world knows it, but have our statesmen got the Government under command? Can they slow up the train and put the tramps off —American Economist, New York.

THE PRODUCTION OF PIG IRON IN CANADA IN 1907.

The American Iron and Steel Association has received from the manufacturers the statistics of the production of pig iron in Canada in 1907. The total was 581,146 tons, against 541,957 tons in 1906, an increase of 39,189 tons, or over 7 per cent. In the first half of 1907 the production amounted to 270,100 tons and in the second half to 311,046 tons, an increase of 40,946 tons. Of the total 572,025 tons were made with coke 8,971 tons with charcoal and 150 tons with electricity. The production of pig iron in Canada in the last 14 years is given below.

Years.	Gross tons.
1894	44,791
1895	37,829
1896	60,030
1897	53,796
1898	68,755
1899	94,077
1900	86,090
1901	244,976
1902	319,557
1903	265,418
1904	270,942
1905	468,003
1906	541,957
1907	581,146

The production of basic pig iron was 341,257 tons, against 246,228 tons in 1906 and of Bessemer pig iron 154,910 tons, against 165,609 tons in 1906. Basic pig iron was made in 1907 by four companies owning nine furnaces and Bessemer pig iron by two companies owning three furnaces. The basic and Bessemer pig iron was all made with coke. Canada has not made spiegeleisen or ferromanganese since 1899. On December 31, 1907, Canada had 16 completed furnaces of which 14 were in blast and two were idle. Of the total 13 usually use coke for fuel and three use charcoal. In addition three coke furnaces upon which work was suspended some time ago were partly erected on December 31.

A NOVEL METHOD OF REPAIRING CRUCIBLE TONGS.

Crucible tongs frequently become soft and spread out of shape and, even though they do not reach this temperature, they often become distorted through long continued use.

Dudley A. Johnson in Graphite describes a novel method of repairing crucible tongs that is so simple as to warrant explanation. Not only is it efficacious, but every foundry can adjust his own.

The method is to have a cast iron cast made of the exact shape of the graphite crucible that the tongs are supposed to fit. The tongs are heated to redness and placed on the crucible. By means of a hammer they can be adjusted at any point with little trouble. The operation occupies but a few minutes and the tongs are sure to fit.

The Farmer's Bank of Canada is about opening branches at Phillipsville and Millbank, Ont.

. . . The . . .
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WILL BENEFIT BY NEW TREATY WITH FRANCE.

In discussing the new treaty with France Mr. Adam Zimmerman, M.P. for Hamilton, announced in the Canadian Parliament that one result of it would be that the International Harvester Co. would hereafter supply their French trade from their works at Hamilton, Ont. instead of from Chicago, Ill.

This development is one of importance not merely to Hamilton, but to Canada generally. In the last three years, according to United States Department of Commerce Statistics, the United States has exported to France agricultural implements to the above value:

1905	$2,750,764
1906	3,070,043
1907	3,586,222

In fact, with the exception of Russia and Argentine, France has been the largest customer of the United States in this line.

During the last three years ending March 30, France has bought from Canada agricultural implements as below:

1905	$359,251
1906	293,536
1907	385,770

The International Harvester Co. claim that they have sold from $1,500,000 to $2,000,000 of the total United States export and state that the provisions of the new treaty, which amount to a preference of from $7 to $9 on binders and $5 to $6 on mowing machines, will make it advisable to manufacture all their product for the French market in Canada.

It will not be necessary to make very great additions to the Hamilton plant for some time but the staff will be greatly increased. At present from 1,600 to 1,800 hands are employed but the works are capable of giving constant employment to over 3,000 hands and if run at high pressure to 3,500 hands.

In referring to the matter the Hamilton Herald reports the company as expecting to not only hold its large French business but to get a much larger slice of the total business of $3,586,222.

As other Canadian implement firms, in Toronto, Smith's Falls, Brantford, Ingersoll, etc., will probably reap a considerable share of this business, this provision of the new treaty must be recognized as a most satisfactory one.

AN EXCELLENT TIME FOR PLANNING.

Many manufacturers are taking advantage of the present let-up in the activity which had kept their plants so busy for several years that they had not the time to make desirable changes or additions.

With the sales forces sending in orders up to and beyond the limit of the factory capacity and with customers loud and aggressive in their insistence for better deliveries, with profits on a fairly liberal margin, the average manager was not willing to shut down the plant for a month to reorganize his factory methods or even for a week to instal new power plant or machinery. It was more profitable to accept the small margin of loss resulting from the use of an old engine or machine than to take the time to determine what type of engine or what kind of machine should be installed.

Now the conditions are reversed. Customers are not clamoring for quicker deliveries. Manufacturers are not idle, however. They realize that if crops throughout Canada in 1908 are up to the average there will be even greater activity during the last of this year and in the following year or two than during the past few years. Moreover they have become alert to the fact that competition is bound to be keener as Canada grows larger and the prize of Canadian commerce becomes more and more attractive.

The owners and managers of Canadian factories realise to-day more thoroughly than ever before that if their company is to survive they must eliminate all waste in engine room, factory or mill, in the office and in selling organization.

So they are balancing up the comparative efficiency of various types of power plants. They are on the alert for information regarding labor saving machinery, equipment or processes. They have not been buying extensively, as they have had ample time to reach their decisions.

They may not buy to-morrow; but to-day they are deciding and the firm who is going to gather the harvest from these buyers later is the firm who makes his arguments strong, aggressive and convincing NOW.

OTTAWA NEEDS PUBLICITY.

Ottawa wants more factories. The question has been thoroughly discussed in the City Council and the desire to have more manufacturing establishments has been so strong that the district of Bayswater was last year annexed and set apart as a special factory district.

No applications for sites in this district have been received. The Ottawa Journal, in a full page article which deals with the subject in a most comprehensive manner, attributes this to the recent financial stringency.

It is true that the lack of available money has delayed

the establishment of several factories which had been projected. Yet at least eight new factories have been secured by Toronto, Montreal and Hamilton in the last six months. The fact is the advantages which Ottawa has to offer are not known to manufacturers.

If Ottawa has a strong argument to place before manufacturers—and according to the Journal this is the case—it should make the fact known to the men they wish to interest.

Manufacturers may not be extending at the moment. They are, however, far-sighted. Business and arguments placed before them to-day will bring forth good fruit in the years to come, not necessarily in a day or a month.

But Ottawa need not expect enquiries until its advantages are known.

ADMINISTRATION OF LARGE ESTATES.

Friends and relatives of manufacturers and others who do business in a large way and who have won a reputation for sound business judgment frequently seek their services as executors of a will or trustees of an estate.

While this is a pleasing compliment to one's shrewdness and of confidence in one's integrity the request is one that should be carefully considered before the honor is accepted.

It is an honor which often entails disadvantages of a serious nature. It imposes an obligation more serious than the care of one's own estate, as in both the sight of the law and of men it is recognized that one must not take the risks or the liberties with a trust fund that one may take with his own estate.

There is, too, always the possibility of conflict between one's own business and the interest of the estate and the more probable danger of misunderstanding between the beneficiaries of a trust fund and the trustee.

It is always safe policy to suggest as an alternative executor or trustee one of the well established trust companies. These companies have made a systematic study of the administration of estates and have their business departmentalized so that any assets, whether they be business enterprises, bonds, mortgages, real estate or life insurance policies, the knowledge of experts is applied to their administration.

The manufacturer whose services are sought for such a duty will do a kindness to his friends if he will recommend to them the service of a trust company which has, in his judgment, proven its stability and good business management.

The Business Situation in the United States.

A Review of the Situation by Chas. A. Moore, President of Manning, Maxwell & Moore, New York, in Manufacturer's Record.

We occupy what might be termed a dual position—that of a manufacturer, having six factories in several parts of the country, and being the principal and almost exclusive representative of some forty other factories as merchants and jobbers, with a large corps of salesmen in the field, and with branch offices in Boston, Philadelphia, Pittsburgh, Syracuse, Cleveland, Detroit, Chicago, Milwaukee, St. Louis, Birmingham, Ala.; Tokio, Japan, and in Europe. We naturally keep in pretty close touch with what is going on in the industrial interests.

This so-called "panic" or "depression" has been of an entirely different character from any I have ever experienced in my thirty-five years of active business connection. Business seemed, as it were, to drop right off abruptly, without any gradual incline downward, but with a sudden stopping in the receipt of orders and a general halt, so that it may be more properly termed a financial depression than an industrial one. It is almost phenomenal to see the condition in which the entire industrial interests of the country were busy, with plenty of orders on their books, and with no apparent diminution in trade, and with no large stocks of goods carried in any line in any part of the country, and then to see business brought to such a sudden stoppage. It naturally causes one to note the condition as peculiar and distinct from any previous business depression we have had in my active experience.

From my experience and observation, and from reports received from the managers of our branches and our salesmen, I am firmly impressed that the present depression is of only a temporary character. When one sees how comparatively few failures or business difficulties have developed in the industrial line with this sudden congestion of business, it furnishes the most positive argument that we were not overdoing our business to such a degree as a great many at first thought. With the enormous resources of this country, its almost phenomenal growth and population, its great needs for everything required in the developing and building up of a comparatively new and growing country, with magnificent crops commanding good prices, and the people in a fine and healthy condition, it does not seem possible that we can remain at a standstill for any long period.

I believe that this temporary recession in business will have its good effect. The people who have been willing to buy anything they could get on sixty days' time, with a chance of selling it in thirty days at a profit, and could go to the banks and moneyed institutions and borrow freely to carry out their speculative ideas, will have less opportunity in the future than they have had in the past, which will be to the benefit of the legitimate business of the country. The American people have an enormous nervous energy, and want to accomplish in six months what people in other countries in similar lines would be willing to take and would expect to take two, three and four years to bring about, and if they fail to meet their expectations as quickly as they desire, they begin to look for someone to blame or some cause to attribute it to other than their own oversanguine and improvident way of doing.

I also believe that we must study greater economy in all walks of life. I think we are an extravagant people, and this is equally applicable to the wage-earner in his expenditures as to the capitalist. I was raised with the idea that it was respectable to be economical, and I feel that that feeling is growing less common among our people.

I also feel that we must give a greater attention to industrial education; in other words, that our people employed in the factories and actively in business are not carefully enough trained in their various duties.

I am in accord with the practice of Germany in the great attention she has given to industrial education, even to the extent of carrying it to compulsory education among the young men and women, who, after they leave the common school, are compelled to give certain hours each week to the learning of some practical occupation—for the boys, draughting, patternmaking or the operation of tools, and for the girls, household duties and needlework, weaving and the use of the hands intelligently guided by their minds. I find in our business, taking young men from school, that they come in without any training, either at school or at home, fitting them for the practical duties of their first work in an office or shop; and we are so exacting and driving ahead at such high pressure that the heads of departments, foremen and superintendents, haven't the time or training to give young men suggestions that would develop them into being more useful to their employers and themselves. In other words, we are not thorough enough; we lack a continued development of what we term the "all-round mechanic" in our shops, who formerly was so well known, and made New England the "beehive" of industry. In that

section a few years ago a young man was proud of the fact that his father was a good mechanic. Now we find that pride lessening and the development of good mechanics waning. We are trying to reach results too rapidly, without a proper fitting for it, and I think that to-day, without any invidious comparison between America and any other country, Germany is gaining its great prestige in commercial and industrial lines on account of the very thoroughness with which they educate their young people for the various callings that they enter.

I am an optimist. In other words, I have never yet sold the United States of America short, and I see no more reason for doing so now than at any time in my knowledge of the country. I remarked to our young men when I returned from Europe in July that if they would apply themselves diligently to their business—in other words, learn their job thoroughly, have faith in the country, and just keep up with its natural growth—when they were my age they would have a business so stupendous that they would hardly realize its development. The great trouble is that many want to grow like the mushroom and destroy all of their competitors in business. In trying to accomplish this they very frequently overdo and go beyond what is a healthy and intelligent development of business. Too many of them have the idea that by creating a corporation or partnership, hanging out a sign and opening a store they should immediately commence doing a business equal to or in excess of that of some of their neighbors and competitors who have been years building up by steady growth a clientage that is only secured by long association and through the growth of that plant of slow growth—confidence—without which no business stands on a safe and sound foundation.

In evidence of our lack of thoroughness compared with some older countries, I called the attention of the machine-tool manufacturers of this country two years ago, upon my return from Europe, to a condition which made a great impression upon my mind—that while American machine-tool builders were the finest designers of labor-saving appliances and the best manufacturers of machine tools, and were so accepted by the people of the world, yet I saw all the American tools sold in France, Belgium, Italy, Germany and Austria by German sales agents, who have equipped themselves for the commercial side of the question and taken our agencies, and were the men who marketed the product of the American tool designers and makers. The reason for that was that the Germans had equipped themselves, learning the language of the country in which they sold the goods, learning the wants of the people, settling down among them and becoming part and parcel of them, while the American representative wanted to skim over the country without knowing the language of the people or making a careful study of their wants, and expected to sell his tools as he would in his home market.

And while so much attention is given to the export field for our particular line of goods, it requires only a very little observation and careful analysis of the situation to know that the market of America is the greatest on the face of the globe; that we consume more; that we absolutely spend more for what we eat, drink, wear and use to the extent of three to five times per capita more than is spent by any other people. I would rather have the market of America than that of all Continental Europe. We know its advantages from observing enterprising Europeans, who are making every effort, through their diplomats and shrewd representatives, to make such trades in the way of reciprocity and reduction of tariff as will enable them to come into this field, which they all desire to occupy. While so much is said on the question of the tariff, and the question of political economy is such a deep one to study and comprehend, yet, in my judgment, it is all summed up in the question of wages. If our workmen are willing to live in the same quarters, with the same conditions for their families, wear the same clothing, eat the same kind of food and work for the same wages that their fellow-workmen in other countries do, there is no need of contending for the maintenance of the protective tariff.

The Use and Abuse of Automatic Appliances on Power Looms

Paper Read by Louis Simpson, Valleyfield, Que., at Semi-annual Meeting National Association Cotton Manufacturers in Washington.

In the proceedings of this Association will be found papers describing the benefits of certain inventions, of certain patented appliances such as warp stop motions, automatic filling motions and automatic shuttle changing motions, all invented for the improvement of the art of weaving on power looms.

These papers have chiefly been written by those interested in the manufacture or sale of these motions, and consequently any discussion which may have taken place on those papers was more or less confined to the particular motion or patents described therein.

These several motions have now been in operation long enough to permit the whole question of the use and abuse of such motions being carefully and thoroughly discussed, and this without any reflections being cast upon the motions patented and placed upon the market by any one concern.

The scarcity of skilled weavers, combined with the largely increased wages paid those weavers makes the operating of the weaving department of peculiar interest to those engaged in the manufacture of cotton goods. Therefore a free and full discussion of this question must, of necessity, be of great interest to those engaged in the cotton trade.

In Great Britain the aim of inventors during late years would seem to have been confined entirely to the perfecting of the details of the style of power loom designed and built so long ago as the middle of the last century, the particular Mecca these inventors seemed to have in view being the securing of such improvements as would enable a weaver to increase the weekly production of such number of looms as custom had assigned to him or her to take charge of

The reasons that have governed the British inventors are obvious.

Customs die hard in European countries.

The basis of cost used in many concerns has for years been calculated upon the actual weekly wage average of the looms. The average of the loom was the criterion by which a concern was known as a good shop or a bad shop.

The weavers' wage being governed by a standard list, the unions were suspicions of and fought against any deviation from that list.

The extensive manufacture of sized goods and of goods which require the weaving of headings, which took up more or less of the weaver's time, and a hundred and one details which do not exist on this continent, all tended to confirm the English inventor in trying to perfect the details of the loom then in operation, rather than to seek to invent a loom built on different lines, and in the operation of which a saving would be found by a weaver producing more goods through attending to more looms.

The position might be briefly summed up as follows:

The English inventor was seeking to increase the production per loom.

The American inventor was seeking to increase the production per weaver.

The extended use of ring spun yarn in the States, combined with the continued scarcity of skilled weavers, encouraged the research of the inventor on this side of the Atlantic, which culminated in the results obtained by the inventive genius of the experts associated with the Draper Co., of Hopedale, Mass., who have since been followed in the same line by many other inventors.

In England the officials of the Operative Weavers' Union claim that under no conditions can the application of a warp stop motion to a loom be of advantage to a weaver, and further that although the use of a good warp stop motion will secure the production of more perfectly woven cloth, yet, in their opinion, the weaver can neither attend to more looms nor produce more work off the looms than was produced before the motion was applied.

On this side of the Atlantic it is now generally admitted that when weaving certain

descriptions of cotton goods a weaver can produce more work from looms on which a good warp stop motion has been applied, than could be done without the aid of the stop motion. More especially is this the case when weaving those descriptions of cotton goods in which the existence of the fault known as "ends out" is a matter detrimental to the sale value of such goods. To produce perfect cloth it is absolutely necessary, even when weaving good warp yarn, that the quantity of looms operated by the weaver should be limited, so that the weaver may be able to visit each loom under his or her charge at frequent intervals. Whereas, were the looms supplied with a stop motion, the weaver is able to rely upon the stop motion to prevent the loom continuing to make cloth when any of the numerous ends which compose the warp have become broken.

To intelligently discuss the use and abuse of the several motions now upon the market it would seem to be necessary to lay down axioms, so that the discussions may be kept within bounds.

The following axioms are submitted:

(1) Warp stop motions are particularly adapted for the weaving of cloths which are sized for weaving purposes only, and where the warp yarn used is not finer than 60s counts, and where the number of ends in the reed does not exceed 70 ends per inch.

(2) The use of stop motions is not adapted for cloth, the warp yarns of which are heavily sized or the warp yarns of which are of inferior quality, or the warp yarns of which are yarns finer than 60s, or where the number of ends per inch in the warp exceeds 70.

(3) The filling changer is peculiarly adapted to the weaving of cloths in which the filling is spun upon the ring frame, in which the filling is of counts coarser than the 40s and for the manufacture of cloths where a broken pick, a broken pattern or a "slub," is not considered to be detrimental.

(4) The filling changer is not adapted for the weaving of cop spun yarn, for the weaving of filling of inferior quality or when specially spun with little twist known as soft spun filling, or for the weaving of counts finer than 50s, nor is it adapted for the weaving of cloth where broken picks, broken patterns, "slubs," thin places, thick bars, are considered to make the cloth unmerchantable. It is true that an invention called a filling feeler has been placed upon the market, but there are objections to the use of this invention which some state make the invention commercially impracticable.

A filling changer loom requires a satisfactory warp stop motion to make the loom practicable.

Besides the filling change loom a loom is built in which the shuttles are changed. It would appear that this motion is more adaptable to the use of cop filling, and especially cop filling of fine counts, and to manufacturers producing cloths containing such filling these looms are interested.

Under the head of abuse might be instanced the use of warp stop motions upon looms weaving cloths which contain a large number of ends of warp per inch. Also might be instanced the weaving of cloths containing very fine warp.

It is not claimed that it is impossible to weave such cloths, but that the disadvantages experienced in the use of the stop motion upon such cloths almost, if not quite, counterbalances the advantages, so that there is not an economic return upon the investment.

In the automatic appliances for changing the filling it is advanced that when looms supplied with these appliances are weaving fine filling, and especially fine cop filling, the disadvantages experienced outnumber the claimed benefits.

PUBLICATIONS.

Forest, Pulp and Paper.—The Saturday illustrated edition of the Toronto Globe was exclusively devoted to Canada's wood products problem. Articles dealing with the rapid reduction of Canada's timber and pulp wood areas and with the processes of pulp and paper making, articles describing in interesting manner the life and work of the lumbermen, also illustrations showing water powers, mills and mill interior and machinery used throughout combined to make this issue of the Globe one of exceptional interest and value to those engaged in the great lumbering or paper industries of Canada.

Canada's Fertile Northland.—A publication which will be of interest to many manufacturers is "Canada's Fertile Northland," issued by the Superintendent of Railway Lands, Department of Interior, Ottawa. It deals with agriculture, forestry, fisheries, minerals, climate, settlements, and means of communication in the regions east and west of Hudson Bay, and makes clear that there is much wealth in the far north waiting development.

Percentage Tables.—A table, printed on strong card, providing the practical dyer with a convenient and exact method of converting percentages of color into avoirdupois. The Cassella Color Co., 182 Front St., New York.

A Handy Note Pad.—One of the most serviceable note pads we have ever received has come from Pennsylvania Fire Brick Co., Beach Creek, Pa. This, in addition to a few lines of effective advertising, is simply a pad of fine writing paper such as an office manager might use to good advantage for making notes.

PERSONALS.

Mr. J. S. Miller, Montreal, formerly connected with the International Steel Co., has been appointed sales agent for the Dynamic Machine Co., Montreal.

The Dominion Wire Rope Co., Limited, held its annual meeting in Montreal, Feb. 20, when the directors were unanimously re-elected. Following are the officers and directors for the current year: President, F. W. Fairman; vice-president and managing director, F. H. Hopkins; other directors, G. P. Butters, Dr. C. W. Colby, E. E. Fairman; secretary-treasurer, J. J. Rosevear.

Mr. R. Holson, vice-president Hamilton Steel & Iron Co., left early last month for the Mediterranean, accompanied by Mrs. Holson and Miss White, of Toronto. They expect to return early in May.

Mr. J. C. McArthur, of McArthur, Corneille & Co., wholesale paint dealers, Montreal, died last week.

The Fraser River Sawmill Co., near Westminster, B.C., are rebuilding their mill and are about to instal large additions to their power plant and machinery equipment.

The Wabessi Cotton Co., Three Rivers, Que., will shortly be installing machinery in their new mill.

The Mount Royal Mill, Cote St. Paul, Montreal, will soon be ready for its new machinery.

The Hart-Otis Car Co., Montreal, have received an order from J. D. McArthur Co., Limited, for 50 Hart convertible ballast cars, 40 tons capacity, 34 feet long.

Official statistics show a rapid growth in the exportation of mica from Canada. In the fiscal year 1896 the shipments were 558,119 pounds, valued at $55,627; in 1906, 1,329,634 pounds, worth $335,591, and in 1907, 1,732,903 pounds, valued at $632,560. The United States is the best customer, taking last year nearly 90 per cent., most of the balance going to Great Britain.

The King Paper Box Co., 381 Ontario St. E., Montreal, are building a new factory 75x75 feet, two stories, at a cost of about $25,000. The new factory will be at the corner of LaSalle and Ernest Sts., and will be completed in May.

The Dominion Car & Foundry Co., Montreal have received orders for 400 Hart-Otis convertible ballast cars from the Canadian Pacific Railway and for 100 of the same cars from the Intercolonial Railway Co.

The Toronto, Hamilton & Buffalo Railway has let contract for spur line to the works of the Canadian Westinghouse Co., Montreal.

The Grand Trunk Pacific Railway will start the construction of temporary shops and round house to be ready for the opening of the line from Winnipeg to Portage la Prairie and points further west.

The Sydney and Glace Bay Railway Co. is building a power house 75x50 feet, contract for which has been let to Rhodes, Curry & Co., Amherst, N.S. The equipment to be provided will consist of three return tubular boilers and one vertical engine, of 300 hp. by the Robb Engineering Co., Amherst, a 200 h.p. engine, one 250 k.w. railway generator, and one 150 k.w. Westinghouse railway generator.

A FEARFUL LOSS.

From Wall Street Journal.

In the past three years the money loss by fire in the United States and Canada aggregated $850,000,000. This sum is more than one-third of the total cost of the war between Russia and Japan. It is only $100,000,000 less than the net public debt of the United States. It is more than one-half of all the gold in the United States. It is equal to the gold in Great Britain and Australasia combined. It is $250,000,000 more than the net ordinary receipts of the United States in a year. It is nearly equal to the total capital stock, paid in, of the national banks of the United States. It is $500,000,000 more than the dutiable imports of the United States in a year. It is equal to the gold imported into the United States since 1896.

MACHINERY AND EQUIPMENT FOR SALE

BUILDERS' SUPPLIES

OUR SPECIALTIES — LIME, CEMENT, sewer pipe, plaster Paris, fire brick and fire clay. ONTARIO LIME ASSOCIATION, 118 Esplanade Street East, Toronto.

PRINTING

THE COMMERCIAL PRESS, 47 Lombard Street, Toronto, make a specialty of commercial printing—Circulars, Letter-Heads, Statements, Etc. Good printing adds to the efficiency of any circular.

INDUSTRIAL CENTRES

PORT DOVER, ONTARIO—In the natural gas belt immense quantities of gas for manufacturing purposes at low rates. Has best sheltered harbor on north shore of Lake Erie, directly opposite Erie, Pa. South terminus of two branches of Grand Trunk; other railways building. Cheap coal and cheap electrical power. Good clay, sand, and limestone. Address W. K. Gordon, Secretary Board of Trade, Port Dover, Ont.

RUBBER STAMPS

B. CAIRNS, 77 QUEEN STREET EAST, Toronto—Rubber Stamps, Seals, Name Plates, Stencils.

BOILERS AND ENGINES

BOILERS.—For special quotations on boilers and sheet iron work, write Park Bros., Chatham, Ont.

SALESMAN WANTED

WANTED—Aggressive salesmen calling on manufacturers in Maritime Provinces, to carry side line. Good commission. Address CANADIAN MANUFACTURER, McKinnon Bldg., Toronto.

SPECIAL MACHINERY

GENERAL MACHINE WORK and repairing: special machinery. The Eccles & Rae Machine Co., machinists, 816 Bathurst Street, Toronto.

ARTICLES WANTED.

SECOND-HAND SAFE WANTED—IN good condition. J. B. Huether, Walkerton.

WANTED SECOND-HAND HAND PUMP fire engine, if not in good order and quality need not offer. Write John A. McDonald, Town Clerk, Kearney.

WANTED TO BUY—A SMALL STEAM-BOAT second hand; also half dozen row boats; state price wanted. Address Geo. Woolway, Lakeside, Ont.

WATERWHEEL GOVERNOR — 2 150-light D.C. generator. Box 237 St. Catharines, Ont.

F. W. HORE & SON, Limited, HAMILTON ONTARIO.
Manufacturers of Shafts, Poles, Rims, Hubs, Spokes, Sleigh Runners, Etc.

SCRAP METALS, PAPER, ETC.

E. PULLAN, TORONTO, positively the largest dealer in paper stock in the Dominion. Also buys rags, iron, metals, etc. Corner Adelaide and Maud. Phone Main 1693, Toronto.

EDUCATIONAL

ELLIOTT BUSINESS COLLEGE, corner of Yonge and Alexander Streets, Toronto, ranks higher than the average college, students admitted at any time; advantages unsurpassed; graduates highly successful; catalogue free.

MACHINERY FOR SALE.

Brown Engine, 75 h.p., good condition; Large Gap Bertram Lathe; Drill, 21 centre, Pollock & MacNab, Manchester; Milling Machine; Slotting Machine; Surface Wood Planer; Post Drill; also a lot of Pulleys and Belting.—JEFFREY BROS., Petite Cote, Montreal.

MANUFACTURING RIGHTS FOR SALE.

SHOP LICENSES to manufacture W. J. Mackay Patent Feather Edge Sectional Steam and Hot Water Boilers under Canadian Patent No. 97582. This is a positive preventative against breakage from rust, is the latest improvement in boiler construction, and is more largely used in the United States than any other construction. For licenses or outright sale at reasonable figures, address, Alexander Mackay, 70 Victoria Square, Montreal, Canada.

DYNAMO WANTED.

WANTED—To rent or buy, a 30 to 45 K. W. alternator, belted type; 2 or 3-phase, 60 cycle, 220 volts preferred. Send price and full particulars to Box 67, Canadian Manufacturer, Toronto.

BUSINESS CHANCES.

BOOKKEEPERS, SALESMEN AND others having capital to invest in well established dividend-paying mercantile and manufacturing businesses situated in Toronto and throughout Ontario, can secure through us a choice of permanent positions, with good salaries attached; your investment guaranteed; strictest investigation solicited. A. L. Massey & Co., Toronto.

FOR SALE
WIRE STRAIGHTENING MACHINES

automatically straighten and cut off accurately any lengths up to 6 feet, sizes of wire No. 11 to 7 gauge.

These machines are in good order and do perfect work. We have three to spare and will sell one or more as desired. Price, complete with counter shaft, $75 each.

Also, have some good nail machines which we will tell you about if interested.

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W. H. STOREY & SON, Limited, Acton, Ont.
Manufacturers of . . FINE GLOVES and MITTS
In every variety and style. Moccasins

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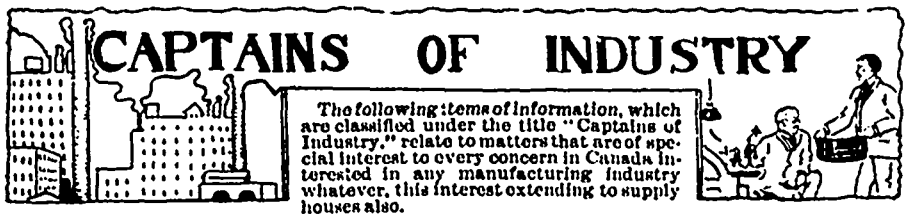
THE WINNIPEG ELECTRIC RAILWAY CO. has for sale

A Large Surplus of Hydraulic Electric Power Ready for Use by Manufacturers.

And would be willing to supply power in any quantity to manufacturers who may decide to locate at Winnipeg or St. Boniface.

Prices and terms on application, stating nature of proposed manufactory and quantity of power required, to

WILFORD PHILLIPS, Manager
WINNIPEG ELECTRIC RAILWAY CO., WINNIPEG



CAPTAINS OF INDUSTRY

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

Application has been made to wind up Monteith-Nixon, Limited, manufacturers of trucks, etc., Toronto.

The Ottawa Paint Works, recently burned out, were fully insured.

The Aylmer Iron Works, Limited, Aylmer, Ont., have assigned in trust to E. R. C. Clarkson, Toronto, and winding-up order has been granted, Mr. Clarkson being provisional liquidator.

A receiver for the Clinton Thresher Co., Clinton, Ont., has been applied for.

Toronto Fireproofing & Concrete Co., Toronto, have been incorporated with a capital of $40,000, to manufacture cement, brick, lime, tile, stone, etc. The provisional directors include W. E. Denise, E. Lake and J. A. Jackson, Toronto.

Sonora Mining Co., Owen Sound, Ont., have been incorporated with a capital of $1,500,000 to carry on a mining, milling and reduction business. The provisional directors include R. A. Thompson, Lynden, Ont., E. Morwick, Hamilton, Ont., and F. W. Barrett, Toronto.

The new dam at Chaudiere Falls, will be built this year at a probable cost of $150,000. The dam will be constructed of concrete and steel.

The Aylmer Packing Co., Aylmer, Ont., have been incorporated with a capital of $40,000, to carry on a general packing business. The provisional directors include N. Booker, J. M. Wrong and R. G. Moore, Aylmer, Ont.

The Oneida Lime Co., Hamilton, Ont., have been incorporated with a capital of $20,000, to manufacture lime, stone, builders' supplies, etc. The provisional directors include W. Anderson, A. Ward and W. B. Anderson, Hamilton.

The Grand Trunk Railway Co. will extend their yards at London, Ont.

The Angrove Foundry, of Kingston, Ont., have received the contract for the castings for fifty box cars for the Rathbun Co., Deseronto, Ont., who have secured the contract to supply the above number of cars for the Intercolonial Railway. This makes 250 box cars that the Rathbun Co. have been called upon to supply for the Intercolonial Railway Co.

The Loughborough Mica Co., Toronto, have been incorporated with a capital of $48,000 to carry on a mining, milling and reduction business. The provisional directors include E. J. Dignum, A. S. Rogers and L. E. Anston, Toronto.

The Goulais River Land & Lumber Co., Sault Ste. Marie, Ont., have been incorporated with a capital of $40,000, to manufacture lumber, timber, etc. The provisional directors include T. Kirby, N. W. Kirby and A. W. Loveys, Sault Ste. Marie, Ont.

It has been decided to erect an auditorium on the front of the College Street Methodist Church, Toronto. The cost will be about $20,000.

London, Ont., will purchase a paving plant for use on the streets of that city. With a $500 equipment the city saved $3,500 on repairs to the roads last year.

The Soo Copper Co., Windsor, Ont., have been incorporated with a capital of $1,000,000, to carry on a mining, milling and reduction business. The provisional directors include E. M. Day, A. C. Peoples and W. B. Sherwood, Detroit, Mich.

Imperial Stone Works, Morrisburg, Ont., have been incorporated with a capital of $100,000, to manufacture stoves, ranges, furnaces, electrical machines, grates, mantels, agricultural implements, castings, etc. The provisional directors include J. Ferguson, W. Duke, Morrisburg, Ont., and S. Coons, Winchester, Ont.

The Sterling Bank, Toronto, is being altered. The cost will be about $4,000.

The Westmoreland Avenue Church, Toronto, recently destroyed by fire, will be rebuilt at a cost of about $35,000.

The congregation of the Lutheran Church, Stratford, Ont., have decided to build a new edifice this year. The site has been purchased and tenders will be called shortly.

Collier-Cunningham Co., Peterboro, Ont., have been incorporated with a capital of $40,000, to manufacture electrical appliances and apparatus, machinery, instruments, etc. The provisional directors include A. B. Cunningham, W. H. Collier and M. A. Morrison, Peterboro, Ont.

Young-Winfield, Limited, Hamilton, Ont., have been incorporated with a capital of $40,000, to manufacture spices, extracts, teas, coffees, etc. The provisional directors include R. M. Young, H. Winfield and F. E. Winfield, Hamilton.

The Canadian Steel Rolling Mills Co., will erect a plant at Campbellford, Ont., at a cost of about $60,000.

Large deposits of iron ore of the hematite variety have been discovered near Port Arthur, Ont. Assays show the deposits to be from 50 to 67 per cent. iron. The new discoveries are extensive and are near the line of the Grand Trunk Pacific.

Cobalt Silver Hill Mines, Cobalt, Ont., have been incorporated with a capital of $1,000,000, to carry on a mining, milling and reduction business. The provisional directors include C. F. Mitchell, W. R. Graham and J. J. Anderson, Cobalt, Ont.

The Ontario Gas & Oil Fields, Limited, Ottawa, have been incorporated with a capital of $1,000,000, to manufacture oil, gas, etc. The provisional directors include J. R. L. Starr, C. E. H. Freeman and T. B. McQuesten, Toronto.

The Board of Education have asked the Paris Ont., town council to raise $40,000 for the erection of a new public school. The building, furnishing and lot will cost $57,000, and of that sum John Penman has offered to contribute $15,000.

The Crystal Bay Canning Co., Kingston, Ont., have been incorporated with a capital of $50,000, to carry on a general canning business. The provisional directors include S. A. McGowan, L. E. Henderson and J. H. Bell, Kingston, Ont.

Business Systems, Limited, Toronto, have been incorporated with a capital of $350,000, to manufacture stationery, loose leaf books office supplies, etc. The provisional directors include W. H. Irving, J. G. Adair and G. H. Kilmer, Toronto.

The Ontario Powder Co., Tweed, Ont., have commenced rebuilding their plant which was destroyed by an explosion a few weeks ago.

The premises of the City View Methodist Church, Ottawa, were destroyed by fire February 23. Loss about $4,000.

The E. R. Burns Saw Co., Toronto, have been incorporated with a capital of $50,000 to manufacture saws, tools, hardware, etc. The provisional directors, include A. W. Holmested, F. H. Potts and T. A. Silverthorne, Toronto.

The Cobalt Light, Power & Water Co., Cobalt, Ont., have been incorporated with a capital of $10,000, to carry on the business of an electric light and power company. The provisional directors include J. K. Gordon, Sudbury, Ont., H. C. Routh and C. A. Gilmour, Cobalt, Ont.

The International Cement Co. held the annual meeting at Ottawa last week. The treasurer's report shows gross earnings for the year to be $269,022.51, out of which a dividend of ten per cent. was declared. The output of the works will be increased to 2,600 barrels per day.

Oldsmobile Co. of Canada, Toronto, have been incorporated with a capital of $4000 to manufacture engines, machinery, motors etc. The provisional directors include F. Sager, Toronto, W. E. Stokes, and F. L. Smith, Lansing, Mich.

The Excelsior Cobalt Larder Lake Mining Co., Niagara Falls, Ont., have been incorporated with a capital of $1,000,000, to carry on mining, milling and reduction issues. The provisional directors include J. C. Niagara Falls, N.Y., S. A. Biggs and S. F. Biggs, Toronto.

The congregation of the Baptist Church, Hamilton, Ont., will erect a new edifice at a cost of about $20,000.

Stitt & Co., Toronto, have been incorporated with a capital of $100,000, to manufacture clothing, dry goods, millinery, furs, etc. The provisional directors include R. W. Ivey, R. J. G. Dow and H. C. Macdonald, Toronto.

Britnell & Co., Toronto, have been incorporated with a capital of $40,000, to manufacture lumber, timber, cement, lime, etc. The provisional directors include J. Britnell, A. E. Britnell and E. W. Wright, Toronto.

The congregation of the Roman Catholic Church, Belleville, Ont., will erect a school building at a cost of about $40,000.

The salvation army, Toronto, will erect on their premises on Church Street, at a cost of about $4,000.

Dunoid Gold Mines Co., Dunnville, Ont.

have been incorporated with a capital of $500,000, to carry on a mining, milling and reduction business. The provisional directors include B. P. Overholt, Guelph, R. A. Biggs and S. P. Biggs, Toronto.

Peerless Motor Specialty Co., Ottawa, have been incorporated with a capital of $40,000, to manufacture motor cars, motor boats, engines, bicycles, castings, machinery, etc. The provisional directors include B. H. Sills, J. Lumsden, and J. A. MacCraken, Ottawa.

The Police Commissioners, Hamilton, Ont., will erect a new police station in the West End of the city at a cost of about $6,000,

A branch of the Bank of Nova Scotia has been opened in Barrie, Ont.

The Hamilton Independent Brewing Co., Hamilton, Ont., have been incorporated with a capital of $200,000, to carry on a general brewing business. The provisional directors include W. E. Burke, T. E. Lavnders and J. T. Greenaway, Hamilton, Ont.

Lecourier Printing Co., Windsor, Ont., have been incorporated with a capital of $10,000, to carry on a printing and publishing business. The provisional directors include A. McNee, F. X. Chauvin, Windsor, Ont., and J. A. Tremblay, Tilbury, Ont.

The Minister of Railways, Ottawa, has given notice of a resolution providing for increasing the Board of Railway Commissioners from three members to six.

The council, Hamilton, Ont., will be asked to appoint an engineer to draw up specifications for the street lighting plant.

Coon's De Marvel Co., Toronto, have been incorporated with a capital of $40,000, to manufacture insulators, transformers, resistance coils, connecting cords, etc. The provisional directors include W. R. Bird, R. Verity and A. F. White, Toronto.

Ontario Limestone & Clay Products, Belleville, Ont., have been incorporated with a capital of $50,000, to manufacture lime, brick, clay, etc. The provisional directors include F. R. Lingham, L. E. Allen and S. Masson, Belleville, Ont.

A contract will likely be made by the city of Stratford, Ont., with the Hydro-Electric Commission for the supply of Niagara power. Debentures will be issued for $35,000 for the erection of a distribution plant.

The town council, Galt, Ont., have decided to take 600 h.p. from the Hydro-Electric Commission. A canvass of the town showed a possible sale of 1,200 h.p. A vote of $66,000 for a distributing plant has been passed.

The Geo. M. Hendry Co., Toronto, have been incorporated with a capital of $140,000, to manufacture stationery, school supplies, etc. The provisional directors include G. M. Hendry, F. G. McKay and W. J. Hendry, Toronto.

A public school will be erected in Haileybury, Ont.

Department of Public Works, Ottawa, invite tenders up to March 18, for the construction of a landing pier at Chute A, Bondeau, Prescott County, Ont.

The Ottawa Country Club, Ottawa, will erect a new club house on Aylmer Road, near Ottawa.

The Department of Public Works, Ottawa, will erect bridges over the White River at Englehart and Hilliardton, Ont.

The Canadian Pacific Railway's new line from Toronto to Sudbury, Ont., which has been under construction for some time, it is announced, will be completed by June. The company will then be able to reach Toronto from Western Canada over their own tracks.

The town council, Deseronto, Ont., have decided to install a gas producer plant at the pumping station. An engine of about 100 h.p. will be required.

Department of Public Works, Ottawa, invite tenders up to March 13 for the construction of a public building at Renfrew, Ont.

The Randolph Macdonald Co., Toronto, have been awarded the contract by the Department of Railways and Canals for the construction of the Rosedale section of the Trent Valley Canal.

A new wing will be erected in connection with the Collegiate Institute, Brockville, Ont.

I. Boadway, Barrie, Ont., will erect a new carriage factory at a cost of about $4,000.

The Home Bank are erecting a branch at Toronto Junction, Ont.

The Home Bank have opened a new branch on Richmond Street, Toronto.

The premises of the Canada Screw Co., the Embroidery and Quilting Co., and D. J. Sinclair, 69 Bay Street, Toronto, were damaged by fire recently. Loss about $10,000.

The ratepayers of Kenora, Ont., will vote on a by-law March 12, to grant the Maple Leaf Flour Mills Co. exemption from general taxes and have the entire agreement confirmed and validated by act of the Legislature, if the company will rebuild their plant in that town.

The Farmers' Bank have opened a branch at Millbank, Ont.

The Traders Bank of Canada have opened a branch at Tweed, Ont.

The Chapman Double Ball Bearing Co., Toronto, are equipping with Chapman bearings, ten wagons for Wm. Neilson, Limited, Toronto.

The Standard Foundry Co., Longueuil, Que., have dissolved and M. Baartman has registered as president of the Standard Foundry Mfg. Co., Limited, Longueuil.

Richard Boronow and Samuel W. Smith have registered the Engineering Equipment & Supply Co., Montreal.

The city council, Sherbrooke, Que., have passed a by-law to purchase the plant of the Sherbrooke Power Light Co. It is understood that the city can get full possession of the plant for $250,000.

Dominion Asbestos Mines, Montreal, have been incorporated with a capital of $1,200,000, to carry on a mining, milling, and reduction business. The charter members include R. C. Grant, W. W. Skinner and F. H. Markey, Montreal.

The Gillette Safety Razor Co., Montreal, have been incorporated with a capital of $250,000, to manufacture razors, cutlery, etc. The provisional directors include A. A. Bittles and J. A. McCullough, Montreal.

Faucher & Gelinas, mill owners, La Patrie, Que., have dissolved.

H. G. Vogel & Co., Montreal, are installing complete sprinklier system in the new building of the Mount Royal Spinning Co at Cote St. Paul, Que.

Williams & Wilson, Montreal, have installed a Kynoch gas engine and producer plant in the new factory of Hutchison & Sticht, 39 Vitre St., Montreal.

W. H. Stewart, Limited, have been incorporated with a capital of $49,000, to manufacture boots, shoes, leather, rubber, varnish, blacking, etc. The charter members include A. G. Parish, A. E. Knox and A. Coke, Toronto.

Holt, Renfrew & Co., Quebec, Que., have been incorporated with a capital of $1,000,000 to manufacture furs, hats, caps, etc. The charter members include J. H. Holt, A. Laurie, Quebec, Que., and A. E. Renfrew, Toronto.

A new post-office building will be erected at Quebec. A site has been secured at the corner of St. Joseph and Dorchester Streets.

The Royal Trust Co. have purchased the Alliance Building, Montreal, for $[illegible]. It is stated they will erect a new office building in place of the present structure.

The Dominion Iron & Steel Co., Sydney, C.B., who have recently purchased the iron mines at Lepreau, N.B., from the New Brunswick Iron Co., may build a smelter at Lepreau this year. The mines will be worked to their fullest capacity.

The Maritime Heat & Power Co., of Connecto, N.B., have purchased the electric light plant of Sackville, N.B., and will operate it in future.

Department of Public Works, Fredericton, N.B., invite tenders up to March 9 for building the Fraser bridge over Bay du Vin River, Northumberland County, N.B.

Department of Public Works, Fredericton, N.B., invite tenders up to March 23, for building Mill Creek Mouth bridge in Albert County.

The Dominion Atlantic Railway will construct a branch between Canning, N.S., and a point north of Berwick. The branch will be known as the Northern Mountain division of the above road.

The Truro Foundry & Machine Co., Ltd., N.S., have been reorganized, with a capital of $100,000. The provisional directors include William J. Kent, Andrew J. Campbell, Truro, and Ernest Crowe, Clifton.

The Dominion Iron & Steel Co., Sydney, N.S., have been awarded the contract by the Canadian Pacific Railway for 30,000 tons of steel rails to be delivered during the season.

An addition will be erected to the [illegible] at North Sydney, N.S.

The premises of the Minitonas [illegible] Minitonas, Man., and several other [illegible] were destroyed by fire February [illegible] about $40,000.

Another new water pipe will be put in by Winnipeg, Man., which will supply 2,500,000 gallons daily to the [illegible] service.

The Dominion Bridge Co., Montreal, secured the contract for the [illegible] structure of the Redwood bridge [illegible] Red River at Winnipeg, Man. It is [illegible] the work will be completed by [illegible]

The City of Winnipeg, Man., has purchased an entire section on the east side

city for the benefit of industrial developments. Companies will be given free sites on certain building and operating conditions being filled. The section is easily accessible to the Canadian Pacific Railway.

Wesley Methodist College, Winnipeg, Man., will erect a new ladies' building this year at a cost of about $100,000.

The citizens of Minnedosa, Man., expect soon to have a waterworks and power system combined, and an electric plant of not less than 600 h.p. may be erected in the near future.

The city of Winnipeg, Man., purpose spending about $1,000,000 on local improvement works this year.

The Winnipeg Electric Street Railway, Winnipeg, Man., are making preparations for the electrical operation of their line to Selkirk, Man.

At the meeting of the fire, water and light committee, Winnipeg, Man., City Engineer Ruttan recommended that another 2,500,000 gallon pump be placed in well No. 5. There is already one pump in the well, but the indications are that with it in service only half the yield of the well is being secured. With the second pump in, the engineer expects to secure 5,000,000 gallons daily, from No. 5. The estimated cost of the pump is $12,000.

Tenders will be received until March 10 for the construction of a steel highway bridge, upon concrete and boulder foundations, over the Souris River, in the municipality of Riverside, Dunrea, Man.

The Brandon Fire Engine Co., Brandon, Man., have been incorporated with a capital of $60,000 to manufacture fire extinguishers, engines, hose, hose wagons, reels, hydraulic pumps, machinery, fire escapes, iron fencing, etc. The provisional directors include J. Empey, J. Burchell and R. Sword, Brandon, Man.

The harness shop of James Martin and several adjoining buildings, Rounthwaite, Man., were destroyed by fire February 27. Loss about $20,000.

The pumping station of the Canadian Northern Railway Co. at Emerson, Man., was destroyed by fire February 26.

The premises of the Pioneer Hotel, Teulon, Man., were destroyed by fire February 26. Loss about $10,000.

The city council, Portage la Prairie, Man., have decided to proceed with the proposed auxiliary system of waterworks, according to plans drawn up by Engineer Chipman, of Toronto.

The premises of the Norman Block, Calgary, Alta., were destroyed by fire February 21. Loss about $20,000.

Weyburn, Sask., is installing a municipal water supply system. A large supply of splendid water will be brought from an impounding reservoir to a standpipe in the town from where it will be distributed by gravity.

A branch of the Bank of Winnipeg will probably be opened in Regina, Sask.

The premises of the Austrian Trading Co., Yorkton, Sask., were damaged by fire February 26. Loss about $3,000.

The International Harvester Co. have decided to make Saskatoon, Sask., a wholesale distributing point. In future the Saskatoon Forwarding & Storage Co will be their agents for this district.

A number of large pipe coils have arrived at the Canadian Northern Railway roundhouse at Saskatoon, Sask. They will be put in position near the fan, which is being installed with the hot blast heating system. The hot blast system is considered the most suitable for heating a building of this sort. The revolving fan is connected to large iron pipes, through which hot air is forced to every part of the extensive building. The rails have been laid between the turntable and the roundhouse and very soon the whole will be ready for use.

Two by-laws are under consideration by the council, Strathcona, Alta. A by-law authorizing a grant of $17,500 to assist in the construction of a high level traffic attachment upon a proposed bridge over the Saskatchewan River, and to provide for raising the said sum of money. A by-law to provide for raising $9,682.45 to cover the cost of a fire alarm system, a steam roller and certain other machines and implements purchased by the city of Strathcona during the year 1907.

H. Springer, Vancouver, B.C., is forming a company to erect an apartment house at a cost of about $250,000.

The National Finance Co., Vancouver, B.C., will erect a three-story office block in that city.

A Y.M.C.A. building will be erected in Vancouver, B.C., shortly at a cost of about $250,000.

E. G. Prior & Co., Limited, Victoria, B.C., have been awarded the contract for the metal required for the superstructure of the new swing bridge over the north arm of the Fraser River, south of Vancouver, B.C. The contract price is fixed at the rate of $8. 0 per hundred pounds. The bridge will have a total length of 2,300 feet, with pivot pier and draw rest.

Victoria, B.C., will receive tenders up to March 16, for supplying the following cast-iron water pipe: 33,000 feet, 12-inch; 18,000 feet, 8-inch; 36,500 feet, 6-inch; 25,000 feet, 4-inch.

A large rink will be erected in Nelson, B.C.

Construction will be commenced early in the spring by the White-Parr railway on their line from Copper Camp to White Horse, B.C. Ore bunkers will be erected at Skagway. Six hundred tons of steel rails have been purchased for the enterprise.

The Barber Mattress Co., Vancouver, B.C., will make extensive additions to their plant this spring.

A general traffic bridge will be erected across the Columbia River at Revelstoke, B.C.

On February 19 the Granby smelter at Grand Forks, B.C., made a new record, consumption of ore being 3,450 tons in the day. Large extensions to the works are to be made and orders are now being given for power equipment, etc.

The Use of Pneumatic Tools in Workshops.

By Charles P. Whitcombe in the Engineering Digest.

From actual results the following comparisons of speeds of out-turn as compared with hand-work have been compiled; it is not claimed that these speeds are applicable to all classes of work, but that they can be generally attained and sometimes exceeded:

Description of Work.	Speeds. By Hand.	By Pneumatic Tool.
Heavy chipping...	1	2 to 4
Calking.....	1	3 " 4
Drilling.....	1	3 " 4
Reaming.....	1	4 " 6
Riveting.....	1 (3 men)	1½ " 2½ (2 men)

The economical results achieved, so far as piece-work rates alone are concerned are nearly proportionate to the highest of the speeds enumerated above, but the reduced rates which have formed the subject of agreement between employers and employed enable the latter to earn higher wages in a given time, and the increased rapidity of out-turn constitutes an important item in the employers' consideration when comparing results with hand work. The following figures show, approximately, the reduction in piece-work rates effected by the use of pneumatic tools in the United Kingdom and Germany:

Desciption of Work..	Percentage off Hand-Labor Rate. United Kingdom.	Germany.
Chipping.....	35 to 50	35 to 50
Calking.....	35 " 55	35 " 60
Drilling.....	40 " 60	50 " 75
Riveting.....	30 " 50	35 " 60
Reaming.....	50 " 75	...

THE "HUM" OF INDUSTRY.

We speak of the hum of industry; one has never really heard it until he has stood in the growing hull of a 600-foot battleship and heard a hundred pneumatic rivets at work, says Kuhlow's German Trade Review. Sign language only is used there. Compressed air is the magician. Even the rivet boys are not allowed to blow the pumping bellows at their forges; a steady stream of compressed air supplies them with forced draught. If a rivet is countersunk the rough surplus projecting is not slowly smoothed away by man power and hammer and chisels; a pneumatic tool does it in a few seconds. If an emergency requires a rivet hole which has not been punched a pneumatic drill does the work as deftly as cook trims a pie crust.

The Ohio Blower Co., Cleveland, Ohio, have completed arrangements with the Sturtevant Engineering Co., Toronto, Ont., under which the latter company will act as exclusive licensees and manufacturers of the "Sturtevant" helico-centrifugal steam and electric motors, cast iron exhaust heads, gravity roof ventilators, etc., for the Dominion of Canada.

The American Tool Works Co., Cincinnati, Ohio, held their annual stockholders' and directors' meeting on January 21. The following officers were elected: Frank L. Geier, president; J. B. Dean, vice-president and general manager; Robert S. Alter, secretary; Henry Luers, treasurer.

The Management of a Weave Room.

By Gamaliel Gaunt in Textile World Record.

"The first hour of the morning is the rudder of the day." This is especially true in the weave room and one of the overseer's most important duties is to see that the weave room help, second hands, loom fixers, weavers and other operatives are on hand at the time for starting work. Getting in late is a serious fault of the help in many mills and few realize what a great loss it causes to the company. The loss of a few minutes in the morning and at noon time means a loss of many yards in the daily production. The overseer should arrive before the time of starting and stand near the door of his room so he can see the help as they come in and be seen by them. He will not find it necessary to say a word to them for when they see him on the lookout they will make it a point to avoid being late. It is a bad plan to depend on the second hands to look after this important matter. The second hands should see that the looms are started on time and also report any weavers that are out.

The overseer should also keep a watch for looms waiting for weavers and use every effort to get them started as soon as possible. I do not believe in the so-called doubling up to keep the looms running. The overseer should find out the cause of each weaver's absence and have a list of spare weavers that he can call on in such an emergency. It is a very good plan for an overseer to have the addresses of all the operatives under his supervision. He should keep posted regarding the number of warps running out and the number that are expected to come into the room, arranging the work for the fixers so that it will be distributed throughout the day and not come all in a heap. While looking after these matters he can see whether the warps are in proper condition, and if not, apply the remedy at once. The spinner is often blamed for bad warps when the spooling and dressing room is responsible. After the yarn leaves the spinner it can be pulled to pieces in spooling and warping and ruined in the sizing. It takes but a few bad warps to demoralize the best of weave rooms.

The overseer should keep close track of the reports from his department so that he may know just how the different styles are distributed among the looms. The reports should be sent to the office as early as possible so that the superintendent can keep in close touch with the work of the mill and make his report to his superiors. When making these reports of production any bad work or shortage of warps or filling should be noted in order that all in authority may know of anything wrong and apply the remedy if possible. The overseer of weaving should be able to detect bad work and quickly determine its cause. To do this he must understand the processes not only in his own department, but also the preceding and subsequent processes of manufacture. The production of the weave room depends in great measure on the good work done in the preceding processes. For this reason the utmost care should be given to the manufacture of the yarn and its preparation for the loom.

He should pay special attention to the management of the loom fixers. If they do good work he should tell them so, as this goes a long way toward stimulating them. Under no circumstances should he allow the fixers to be rude and discourteous to the weavers. Every fixer should be made to understand that he must respond promptly and pleasantly when the weaver calls him. The trouble may be trifling and caused by the weaver herself, but regardless of this it is the fixer's duty to go to the loom, investigate for himself and apply the remedy.

Costs of Manufacture in the Canning Factory.

Address by Albert T. Bacon,

Packers are turning with critical attention to the subject of manufacturers' cost. They are waking to the fact that in order to increase the volume of business and develop its enduring qualities along profitable lines, they positively must know where they are at. A man with capital, energy, and ability is not reaping the fruits of his investment or his industry unless he is master of his financial situation, be that situation simple or complex.

The two points expressed by your worthy president defining what should be the scope of this paper, are:

1. Necessity of canners knowing costs.
2. Desirability of correct methods of securing this information.

The knowledge of costs will inevitably bring two results in establishments where the managers are masters of the situation. First, it will reduce the cost. Costs will go down where a wise supervision of expenditures is in force. Where expenditures are sufficiently divided the managers can readily follow the variations in the cost of each element.

Competition is the life of trade and it is equally true that comparison is the life of manufacture. With each department comparing itself with the operations of a year ago or with similar operations in another department, or in another factory, there will be a new element of life injected into the factory routine.

The second result is that knowledge of cost will help you to fix selling prices safely in advance of cost. Perhaps more factories fail because they don't know their costs than for any other reason. They don't let their books tell them what the goods cost. Packers estimate their costs, and then sell futures on the basis of their estimates. An increase of five cents per dozen in the actual cost over the estimate means a reduction of $5,000 in profits on a pack of 50,000 average cases. I have known an increase of several times this amount in the actual cost over the estimate in the single item of general expense. This leads me to say one word in closing about actual cost vs. estimated cost.

It is a difficult matter to estimate the cost of packing goods. All of your green goods and supplies can be figured to a nicety as can a portion also of your labor cost. You can blow your whistle for some workers the minute you want them, and then send them home the minute the pack is sealed. But, even where much of your help will accommodate itself to you in this way, many expenses will not stop at the sound of a whistle. Some workers must be employed by the week or the season.

Power plant expense is more or less constant throughout the season. Depreciation of machinery and buildings, repairs, insurance, taxes, and warehouse expense are on a yearly basis. There is much more of this fluctuating expense to be divided than some estimators are willing to include in the forecast. In view of the fluctuations in every item of cost and expense as well as the variations in the number of dozens which share the expense, it appears that no estimate should be accepted with the childlike confidence that the actual results will conform to the forecast. Its best index to what you can do is what you have done already, and, if you will intelligently divide expenditures so as to say with certainty what your goods actually cost you last year, you have the best basis for future estimates.

Electroplating Springs.

From the Brass World.

Owing to the demand for good spring metal in electrical apparatus, steel is now more extensively used in such work than heretofore. It surpasses the non-ferrous metals for this purpose for the reason that it can be tempered. The non-ferrous metals cannot.

Although a steel spring cannot be equalled the electrical trade demands red metals for their apparatus, and in many instances such appliances are rejected unless all parts have the appearance of copper. On this account it is necessary to give the steel springs a coating of copper by electrodeposition.

Many persons seem to have the belief that a steel spring will have its temper partially removed by electroplating and that a plated steel spring is much inferior to one which has not thus been treated. This idea is erroneous and a steel spring that has been copper plated is usually as resilient as one which is left in its original condition. To remove the temper from a steel spring, it is necessary to heat it nearly to redness. This condition is never reached in electroplating. The highest temperature that can possibly be attained is that of boiling water, and such temperature has no effect upon the spring.

Steel springs to be copper plated should be cleaned in an electric cleaner if possible, with a current of from 10 to 12 volts and keep the solution hot. This will serve to remove the grease between the coils of the spring. It is then rinsed, run through the usual acid dip, again rinsed and then copper plated in hot cyanide copper solution standing at 15 degrees Beaumé (for basket work) and at a temperature of about 120 degrees F. No fear need be entertained in close coiled springs that the copper will bridge over in plating. Experience has demonstrated that this does not take place.

THE VALUE OF A WATER POWER.

The value of a developed water-power, stated by Chas. T. Main, mill engineer and architect, of Boston, to be as follows: "If water power can be run cheaper than steam, its value is that of the power, plus the cost of plant, less depreciation. If it cannot be run as cheaply as steam, considering its constancy, etc., the value of the power itself is nothing, but the value of the plant is such a sum as could be paid for it new, which would be equal to the total cost of running down to the cost of steam power, less depreciation. That is, it is worth just what can be got out of the plant and no more."

Practical Hints for the Factory or Mill Superintendent.

There are so many excellent technical publications issued throughout the world that even the most ambitious superintendent could not afford to read them all to get the cream of their articles. We propose in these pages to give some of the most practical hints and suggestions which appear in the technical press in all countries.

Our Experience With Electric Drives.

By Herbert in Wood-Worker.

Ten years ago, when our old shop was torn down to make room for public improvements, we had to erect a new building in another location. The question came up as to what kind of power we had better install, whether steam or electricity. At our old stand we had always used steam, renting it from a large adjoining factory. In our new location, however, such an arrangement was not possible, because our new building stood quite a distance away from the nearest steam plant. In this event there remained no alternative except to put in either a new steam engine or install electric drives.

For some time we debated the subject, weighing as best we could the pros and cons in each case, until at last we concluded to give electricity a trial. Inside of a week after that wires were strung from the street to the shop, a motor was fixed in place and the new drives installed for fair. Ever since that time we have used no other, nor indeed have we ever had the least desire to make a change. After an experience covering a full decade we are convinced more than ever that electricity is the ideal power-transmitter for all practical purposes. It certainly possesses marked advantages over steam.

It is cheaper. I do not refer here to the first cost of installation, although it is true that we paid considerably less money for the motor and wiring than we would have had to pay for a new steam engine. Rather I am speaking now of the steady, everyday use of the current, week in and week out. Looked at from this standpoint, the expense is much less than in the case of steam. On an average our bills have been and still are less than one-half what was paid under the old arrangement. Of course, the reader will understand that we are not wasteful with the current. The fact of the matter is, the power in our shop does not need to be used continuously all day long. There are days when it is not needed for hours at a time. Whenever that is the case we see to it that the current is shut off. In this way we prevent all waste, and pay only for the power we actually use, and no more. To put this matter in a more concrete form, as this horse eats only while he works, we pay for the actual work he renders. On the score of economy we unhesitatingly extend the palm to the electric drive.

Another most commendable feature about this drive is its availability, night or day, all the year round. This claim cannot possibly be made in behalf of steam. When, at quitting time, the engineer shuts down his engine for the day, not a bit more power is obtainable until the next morning, and in the case of holidays and breakdowns, whole days are lost in idleness. During such periods no matter how much you may stand in need of the assistance of your machines, they are all at a standstill. Personally, the writer is a stickler for the eight-hour law as applied to a day's labor; also, he believes thoroughly in a strict observance of all national holidays, but there are times, as every one knows, when the rush of business is so great as to necessitate overtime. Sometimes workmen are required later than regulation hours, and once in a while to trespass on a holiday, but whenever this happens to be the case, and the men are dependent upon the running of machinery to help them out, if power is lacking they are seriously handicapped in their work. On such occasions—and they are liable to occur in any shop—the ever-ready electric current is always at hand, and by turning on the switch, your machinery starts a-humming in an instant. This horse is always there, already harnessed for work at a moment's notice.

It dispenses with unnecessary noise. Probably the most unpleasant feature of a shop run by steam power is the ceaseless rumble and rattle of shafts and wheels. Whether the machines are in active use or not, this noise keeps on without stopping. Of course, a person may get used to it in time, still it wears on the nerves, and is real annoying whenever persons are obliged to converse with each other. To be heard they are forced to shout themselves hoarse. In a shop electrically equipped, however, this sort of annoyance is done away with to a large extent. Just as soon as the power is no longer needed and the current is shut off, the place becomes quiet at once, permitting conversation with as much ease and comfort as though one were in his parlor.

Other merits as well may be claimed for electricity, but sufficient has been said already to prove its superiority to steam in a wood-working shop. Our experience in the use of it has been most satisfactory in every way, and we have no desire to swap horses and take the old one back again. When we strike a good thing, we believe in clinging to it for dear life.

Gas Engine Valves.

E. T. Blair in The Engineer's Review.

There are three valves, as a rule, which are of considerable importance regarding the operation of a gas engine. In fact, the valves of a gas engine are such an important factor that the operator should make it his business to become perfectly familiar with every phase of their construction, condition and operation. It is absolutely essential that the operator know that his valve opens and closes at the proper time, and also that the valve is seating properly.

The three valves are, the fuel valve, the receiving valve and the exhaust valve. The fuel valve admits the fuel to a current of air as it passes to the cylinder. The functions of the receiving valve are to open the air passages from the outside of the cylinder to the interior.

The exhaust valve permits the burnt gases to escape from the cylinder after having spent the greater portion of their force against the piston.

The fuel valve is made in two forms, a needle and poppet valve, which may be designed to open either by means of a positive cam or lever mechanism, or as the result of the suction of the piston. The other type may be only a needle opening and point, which leads to the seat of the receiving valve.

If the valves are operated by means of lever and cam, it is necessary for the operator to know when they open and close properly, which can be determined by an occasional test to note whether the wear on the cam and the cam roller is having a detrimental effect on the correct action of the valve.

The following is the proper method of testing a valve for the proper time of opening and closing, as well as the lift from its seat. First, revolve the flywheel in the direction in which the engine is running until the receiving valve cam just begins to open. Stop the engine and note the position of the piston. If the valve is operating in time, the piston should be just leaving the inner center and starting on its outward stroke.

The valve is out of time if the piston is in a position considerably past the inner center, and indicates that the valve is opening too late. This may be due to natural wear, a wrong setting of the gears driving the cam, or a bent condition of the valve lever. To determine this, revolve flywheel in the same direction as previously done until the valve seats itself or closes. The engine should be stopped just at the point where the cam releases the roller. If the piston is found to have reached the outer center, the valve has closed at the proper time.

If the valve closes before the piston reaches the outer center, it has too early an action. If the valve opens too late and closes too early, it is good evidence that the cam roller and cam are badly worn, or that the valve lever is sprung. Should the valve open too late and close too late or open too early and close too early, it is an evidence that the gear operating the cam is not properly set. The receiving valve should be open when the piston is making its complete forward stroke.

In order to determine the lift of the valve measure the length of the valve stem protruding from the valve chamber when the valve is seated and again when it is lifted from its seat.

Another trouble which affects the lift of the receiving valve is wearing into its seat. It is evident when this occurs to any great extent that the valve would have to lift so much more in order to give the same result before the wearing occurred as the wear is not automatically taken care of the life remains the same. It is evident that the valve opening is about a quarter inch less than it should be, hence it is seen that

outside measurement is not to be wholly depended upon. The exhaust valve will be found in a worn condition more frequently than either the fuel or receiving valve. This is doubtless due to the intense heat in which it continues to operate, thus causing it to work harder and wear faster.

Under normal conditions the exhaust valve should open at about four-fifths of the working stroke of the piston, which is just before the piston reaches its outer center and remain open until the piston has reversed and passed through the entire length of the exhaust stroke This lets out the pressure within the cylinder and reduces it to nearly atmospheric pressure before the piston begins its actual exhaust stroke. Back pressure in a gas engine reduces the power of the engine, as back pressure in a steam engine affects its operation.

To be contented to merely start and stop a gas engine shows that the operator has little or no ambition and to remain in ignorance regarding the functions of the different cams, arms, etc., attached to the engine will surely bring discredit upon the operator when the time for quick action in an emergency demands knowledge concerning them.

FREE SAMPLE OF AMATITE.

It is so difficult to convince the average buyer that it is really possible to make a roofing which does not have to be painted or coated, that the Barrett Manufacturing Co. take elaborate pains to supply every inquirer with a Free Sample of Amatite, in order to show what the famous mineral surface is like.

This real mineral surface is firmly embedded into the top surface of the roofing and is, of course, practically indestructible by wind or weather, and can be exposed to the elements without fear of damage. Paint or coating is not needed for Amatite and the manufacturers do not manufacture anything in the way of paint for use upon it. An Amatite roof, once laid in position upon factory, mill or outbuilding, will stay there indefinitely without further care or attention of any kind.

The manufacturers are always ready to send a free sample on request. Address Barrett Manufacturing Co., New York, or the Paterson Manufacturing Co., Toronto

NOTICE The following are the Factory Inspectors for the Province of Ontario:
JAS. T. BURKE, Parliament Buildings, Toronto.
THOMAS KEILTY, Parliament Buildings, Toronto.
ARTHUR W. HOLMES, Parliament Buildings, Toronto.
JOHN ARGUE, Parliament Buildings, Toronto.
MARGARET CARLYLE, Parliament Buildings, Toronto.
MRS. JAS. R. BROWN, Parliament Buildings, Toronto.
Persons having business with any of the Inspectors will find them at the above address. HON. NELSON MONTEITH, Minister of Agriculture.

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