

# CANADIAN CONTRACT RECORD

*A Weekly Journal of Engineering, Public Works,  
Tenders, Advance Information and Municipal Progress*

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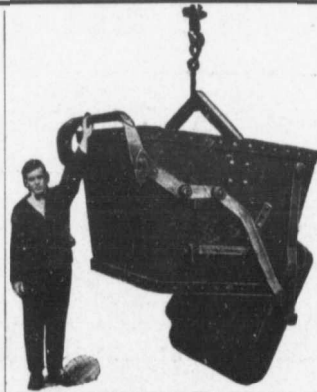
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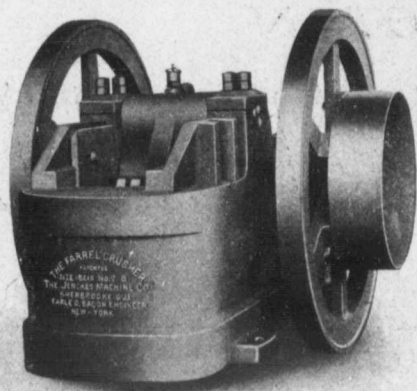
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# TENDERS AND FOR SALE DEPARTMENT



Department of Railways and Canals,  
Canada.

**TRENT CANAL.**  
Rosedale Section.

## NOTICE TO CONTRACTORS

Sealed Tenders addressed to Alex. J. Grant, Superintending Engineer, Trent Canal, Peterboro, and endorsed "Tender for Trent Canal," will be received until 10 O'CLOCK ON WEDNESDAY, THE 20TH NOVEMBER, 1907 for the works connected with the construction of the Rosedale Section of the Canal.

Plans and specifications of the work can be seen on and after the 31st October, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Superintending Engineer, Trent Canal, Peterboro, Ont., at which places terms of tender may be obtained.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,  
Secretary.

Department of Railways and Canals,  
Ottawa, 26th October, 1907.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.



Sealed Tenders addressed to the undersigned, and endorsed "Tender for Astronomical Observatory, Toronto, Ont.," will be received at this office until THURSDAY, NOVEMBER 21, 1907, inclusively, for the construction of an Astronomical Observatory at Toronto, Ont.

Plans and specifications can be seen and forms of tender obtained at this Department and at the office of Burke & Horwood, Architects, Toronto, Ont.

Persons tendering are notified that tenders will not be considered unless made on the printed form supplied, and signed with their actual signatures.

Each tender must be accompanied by an accepted cheque on a chartered bank, made payable to the order of the Honourable the Minister of Public Works, equal to ten per cent (10 p.c.) of the amount of the tender, which will be forfeited if the person tendering decline to enter into a contract when called upon to do so, or if he fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By Order,

FRED. GELINAS,  
Secretary.

Department of Public Works,  
Ottawa, October 29, 1907.

## For Sale

One No. 9 Rear Dump Smith Mixer, Steam Power.  
One No. 1 Ideal Brantford Mixer.  
Both in first class condition, suitable for sidewalks or any concrete work. Apply to Box 117, CONTRACT RECORD Office, Toronto.

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Township of Derby, County of Grey.

Sealed lump tenders will be received by the undersigned up to the 28TH NOVEMBER, 1907, AT 6 O'CLOCK P.M.—for the purchase of Drainage Debentures of the following description:—Ten of \$82.66 each, including both interest and principal, payable at the Traders Bank, in the Town of Owen Sound, on the 10th day of December in each year, the first to fall due on the 10th day of December, 1908, and the last on the 10th day of December, 1917.

The Debentures will be deposited in the said Bank, and delivered on receipt of the purchase price in a lump sum on or before the 5th day of December, 1907.

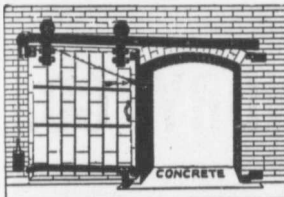
For further particulars apply to the Township Solicitors, Messrs. MacKay, Telford and Grosch, Box 390, Owen Sound, or to

WILLIAM BEATON, Township Clerk,  
Township of Derby, Box 39, Kilsyth, Ont.

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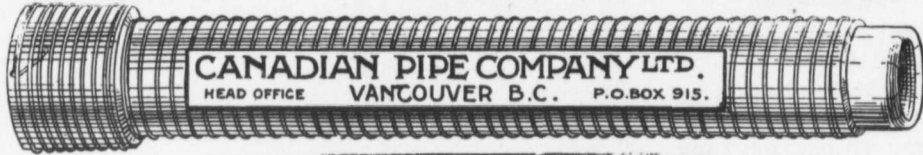
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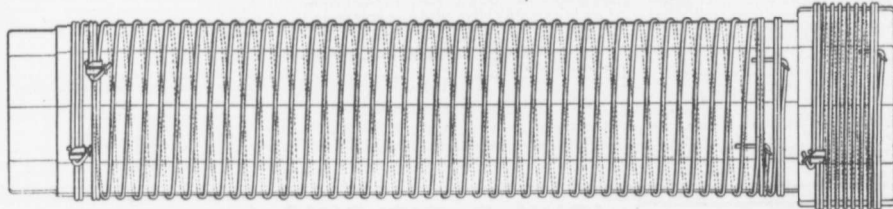
Last year we made 75 miles of pipe of various sizes; one line alone being over 10 miles of high pressure 8-inch pipe for a pumping plant for the C.P. Ry. Co.

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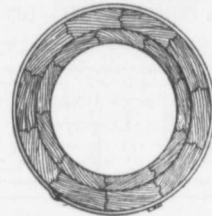
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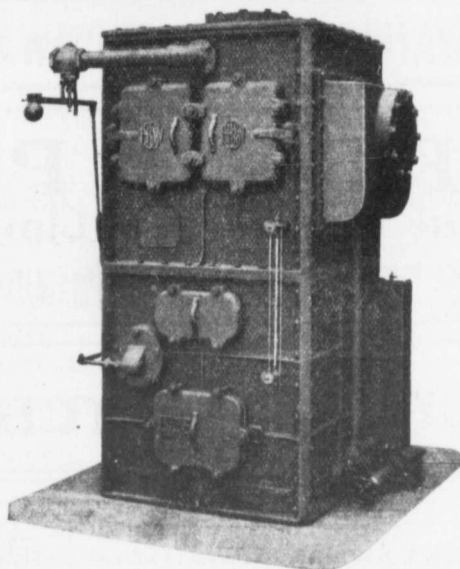
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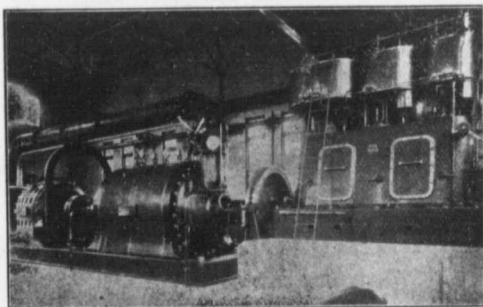
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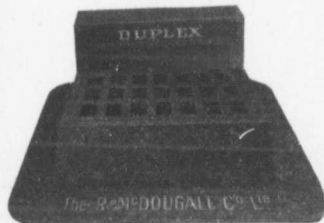
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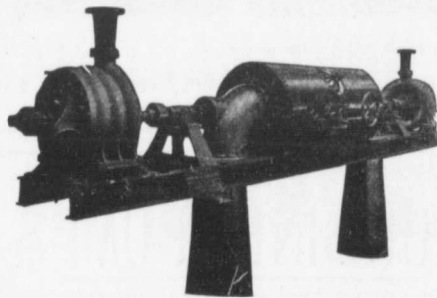
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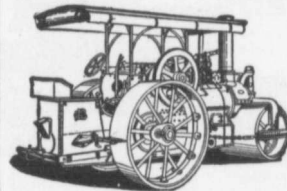
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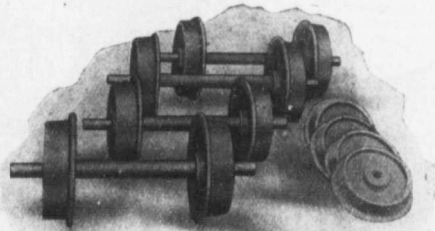
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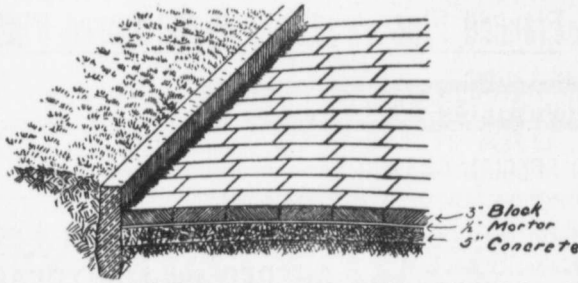
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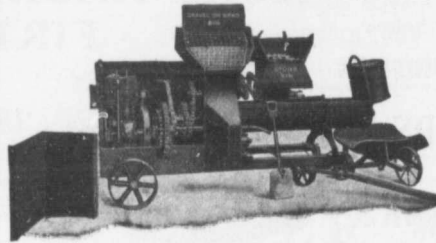
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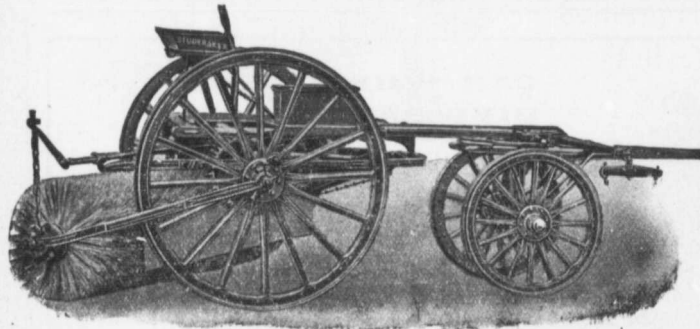
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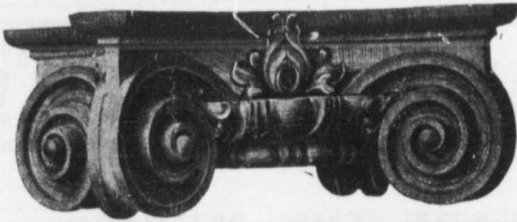
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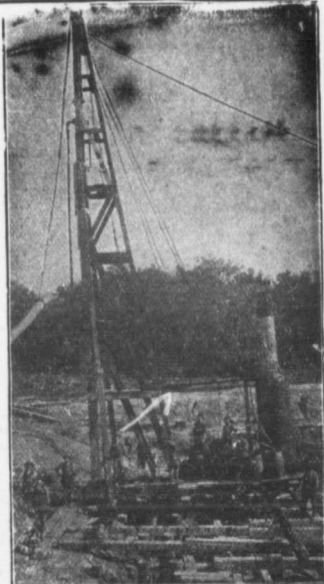
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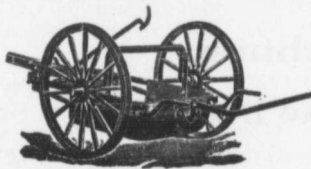
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## THE BUILDING OUTLOOK.

There is a decided increase of caution noticeable in Canadian building centres at the present time, and projects for immediate and future construction are few compared with former years. In Toronto there are said to be an unusual number of houses for sale and to rent, principally because of the fact that many small families are unwilling to bear the expense of housekeeping during the coming winter and will either board or share a house. That living expenses will be unduly high this winter is a foregone conclusion, while a general shrinkage in expenditure will tend to weaken the demand for unskilled labor and curtail the output of many industries.

This condition of affairs has fortunately not come at a time when speculative building has flooded the market with unsalable houses. On the contrary, speculative building has been held within due bounds during the past season, and if there are rather more houses on the market than the present demand calls for it must be conceded that they have in most cases been built in response to an apparent need and by other than borrowed capital.

In the rural districts of Ontario much has been lacking in structural activity all season, and the amount of new work now under way is practically nil. An open fall would do much to maintain activity among the building trades, especially in the country,

where the weather is a strong governing factor in inducing or delaying structural operations.

## NATIONAL BUILDERS' ASSOCIATION.

Developments both in reference to labor troubles and to other exigencies in the labor trade make it obvious that there is place for a national organization of builders—such as was organized in Toronto on September 1 last. "The Canadian National Association of Builders" will make possible co-operation among master builders and the employers of labor for allied trades, that these may form a unit of power in combating conditions inimical to their interests. The idea apparently is that a national association be formed of master builders, builders' exchanges and employers' associations of building trades, with permanent headquarters, of which a permanent secretary would be in charge and be in active communication with the various allied organizations throughout the Dominion. At present it is not too much to say that there is a noticeable lack of harmony and co-operation among many of the builders' exchanges in Canada which an active central organization might successfully overcome.

It has been pointed out that trades unionism affords a good example for builders and employers to follow. Here is an organization so broad in scope that it covers the industrial world like a net, embracing little and big, from the few mechanics and laborers employed in some obscure village to the elaborate formation of labor forces in large cities, with their officers and chapters—all forming a meshwork of united interests and all subject to the directing head of systematized unionism. In like manner might an organization of employers be formed with the master builders' associations, the builders' exchanges and the employers' associations of building and other trades becoming the nuclei from which ramifications would extend so as to reach every employer of labor in the country. There are few master builders who would refuse to identify themselves with such an employers' organization, particularly in view of the fact that labor is extending its exploits even to

the contesting of seats in the provincial and federal legislatures.

In drafting the by-laws, rules and regulations under which a national organization must be operated it is essential that they be on broad and sympathetic lines, complying with national conditions and not conflicting with local organizations. Particularly should care be taken to refrain from arousing bitterness between already existing exchanges, as careless disregard of harmony at the inception of so important a project may sow the seed of lasting discord and thwart the purpose for which a national association of builders has been created.

## INTERNATIONAL TRADE UNIONISM.

International congresses of organized workers are a new and interesting development of the trade union movement, writes a correspondent of "The Contract Journal." Trade unions are in their origin essentially British. The movement was started by British workers, and admitting the result of their work to be a shortening of the hours of labor (for both the ten and nine hours' movement as well as the eight hours' agitation of to-day were made effective by the trade unions) and a higher wage rate, their effect has been to somewhat disturb the economic balance of the cost of production in England as compared with continental countries. This is a factor of considerable importance to a great manufacturing and exporting country, and one which can not be ignored by manufacturers, particularly as they are in the position of having no protection for their products in the home market. This truth appears to have been realized by English trade union leaders. They have come to see that if hours were shortened too much and wages pushed too high, while long hours and low wages continued to prevail abroad, the time must come when manufacturers in England would be handicapped out of the competitive race not only abroad but in the home market. Hence the movement which has been started by the mining and textile trades to extend the work of the trade unions from a national to an international basis.

# THE COMMERCIAL SITUATION

## THE SHORTAGE OF CARS.

Evidence taken by the Railway Commission now in session in Toronto shows that the carrying trade of the province is burdened by an unfortunate shortage of railroad accommodation. The railroads in this regard do not stand on the same basis as ordinary commercial enterprises. We have in Canada adopted a railway policy by which the railways are paid in part by subsidies for the services they render. Every shipper makes two contributions to the railway, the one directly to the company's official and the other directly through the tax collectors. In soliciting and accepting subsidies the railways incur proportionate obligations and the evidence before the Commission shows a grave neglect as to their fulfillment. There is apparently a feeling in railway circles that they are justified in designing a policy with a single eye to revenue from freight and passenger traffic, ignoring the obligations incurred by the revenue from subsidies. This is seen in the shortage of cars, the neglect of Canadian for American business, the discrimination between ports and shipping points, unfair switching charges, etc. For builders and contractors the work of the Commission should have abundant interest, as many of them have of late been not among the least of the sufferers from ineffective railroad service.

## WESTERN BUSINESS.

It appears that there was considerable unrest among some eastern business men regarding the situation in Central and Western Canada previous to this month. They could hardly be blamed when such "wild" rumors were being circulated regarding crop shortage, crop ruin, crop everything except good. Now, however, the clouds are fast scattering, and the threshing operations in one of the finest Octobers ever seen reveal the fact that this part of Canada has a good average crop, worth considerably more money

than in any previous year. Commenting on matters here, Mr. Boyle, western representative of "The Toronto Globe," writes recently to his paper as follows: "It is safe to say that the mercantile element, a most important factor in the business life of the west, has been attending strictly to its knitting during the past six months, and has been able to withstand the threatened stringency. The result is that a general effort is being made to meet obligations as these fall due. On the whole there appears to be a feeling of satisfaction, and it is generally supposed that there are more pessimists in Winnipeg than there are proportionately in other trade centres throughout the west."

As "The Commercial" has already said, land speculation has been curtailed by the money stringency of the past season, and that will leave more funds in the farmers' hands to circulate in the general business of the country. The payment of old debts and the volume of cash business this coming winter should be on even a larger scale than in the season of 1906-7. Last year, although the crops were the largest in the history of the country, it cannot be denied that altogether too much of the returns went into real estate and other speculation.

## SUGGESTION TO THE BANKS.

While we commend the action of the banks in curtailing speculation, we think that they would put new life into business all through the Dominion by loosening the strings just a little more for a while. We believe the country has learned its lesson and taken warning, and if money were now allowed to circulate more freely from the banking institutions, it would be used in promoting regular business.

If the banks would become more free with the "coin" it would dispel the doubts or suspicion that some have, and would instil greater confidence generally, and change the feel-

ing of pessimism to optimism. The majority of the banks have a surplus supply of money in their vaults, and we respectfully suggest that they give the country the benefit that is in their power to give by letting the money loosen, since "wild speculation" has been controlled. The banks that have not sufficient ready cash to let out should borrow from the banks that have plenty. They have about accomplished their purpose of curtailing unnecessary credit.

## THE VALUE OF THIS YEAR'S WESTERN CROPS.

The value of this year's crop in the West is thus estimated by a well known Winnipeg jobbing house, the figures showing, not as is popularly supposed, a decrease in value as compared with those of last year, but an increase of nearly \$3,000,000.

Season 1906-7—Wheat, 90,000,000 bushels at 65 cents, average price paid the farmer at country points in Manitoba and the Territories, \$58,500,000.

Season 1907-08—Wheat, higher grades, 40,000,000 bushels at 88 cents (estimated average price for the year paid the farmer at country points, Manitoba and the Territories), \$35,200,000; lower grades, 30,000,000 bushels at 60 cents (estimated average price paid for the year at country points, Manitoba and the Territories), \$18,000,000; total, \$53,200,000.

Decrease—\$5,300,000.

Oats, 75,000,000 bushels (estimated yield of oat crop for the year 1907-8, at country points in Manitoba and the Territories), at estimated increased value per bushel over previous year of 10 cents, \$7,500,000; barley, 15,000,000 bushels (estimated yield of barley crop for the year 1907-8 at country points in Manitoba and the Territories), at estimated increased value per bushel over previous year, 5 cents, \$750,000; total, \$8,250,000.

Increased crop value as against 1906-7, \$2,950,000.

### A RAILWAY HUNG ON CABLES.

An interesting use of a cableway to support a temporary track used in making a fill across a marsh is described in *Engineering News* (New York, October 10). The writer notes that although the suspended cableway with traveling bucket is a standard method of making long, inaccessible railway fills, a cableway has rarely been used as the framework on which to lay a track for the carrying of dump cars. The railroad on which this method was used in two places is the Lake Erie & Pittsburg Railroad, now under construction from Cleveland to Pittsburg. We read:

"Although the same general principle was utilized in each one of these examples, the local conditions were

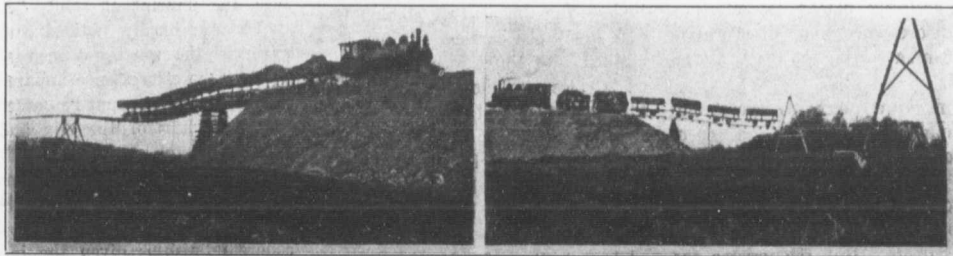
blue clay bottom. At intervals the mud crust was only 15 feet thick, and under it was a heavy underground stream flow so great that the water spurted several feet out of the sounding pipes. These subterranean lakes were so numerous as to make impracticable the ordinary methods of filling."

Two unsuccessful attempts at crossing were made; one by laying track on a trestle built on a foundation of crossed timbers and brush, and another by constructing a pile trestle on the ordinary plan. In both cases the track sank into the mud, and the cable scheme was tried as a last resort. Says the writer:

"Two 1 5-8 inch steel cables, about 5 feet centre to centre, were stretched from an anchorage in the fill already

hole 25,000 cubic yards in a month) shoved ahead and completely carried away the remaining portion of the pile trestle which was serving as forward anchorage for the cableway. Timber towers were then built ahead and blocked up and skidded forward as the work progressed. This is the manner in which the work is now being carried on. Permanent towers, founded on piles, have been erected far ahead of the work to act as anchorages, and the movable towers are used as supports for the cableway."

In the second place where cables are being used there is a deep gorge with solid bottom, but calculation showed that the cable method would be cheaper than the ordinary plan, saving about \$1,700, or more than half the cost.



A VIEW OF THE FILL.

CARS FILLING EMBANKMENT FROM CABLEWAY.

different and the details of construction were independently solved. The first was made over a deep marsh of too soft a nature for the maintenance of a pile trestle, and the described method was adopted only after several other schemes had failed; the second fill was over a deep gorge with good solid foundations, and the cableway was adopted primarily because it seemed to be the cheapest and most efficient method.

"About twenty-five miles south of Cleveland . . . the line of the new railroad crosses a swamp on an embankment from 25 to 33 feet high and 1 1-4 miles in length. The bottom lands across which the line is located are used for raising celery and are overlaid by a black, decomposed vegetable soil, incapable of sustaining any material weight. Sounding showed the greater part of the ground to have a mud crust about 15 feet thick, then quicksand for 15 feet, then 10 feet of soft clay overlying the hard

made, over the nearest bent of the pile trestle remaining and on to the farther bents, to which the other end was anchored. Upon these cables ties were fastened . . . and a track laid upon which the loaded cars were pushed and dumped, one at a time, at the end of the fill. The first span used was over 200 feet, covering the hole into which the trestle had sunk and which was at this time a pond of water 175 feet long and 14 feet deep. On account of the large span made necessary by the impossibility of driving a trestle bent in this pond, the sag in the cable was very great, and the instability of the cars quite marked. This, together with the great depth of the fill, necessitated the constant jacking of the track under the fill.

"As soon as this sink hole was crossed a large trestle bent was erected, and the long span decreased by guy supports and timber grillage blocks. The material deposited in this

### EGYPTIAN LABOR.

"The Egyptians were the builders," said a contractor enviously. "No wonder their monuments will endure forever. Labor was nothing to them. As you would spend a cent on a newspaper so would an Egyptian king put 10,000 men to work upon a temple. Labor, you see, cost nothing. A striking example of the Egyptian prodigality of labor lies in the fact that no less than 2,000 men were employed for three years in carrying a single stone, a stone of unexampled size, from Elephantine to Sais."

On three counts Sol Rosenburg, of 59 Nelson street, Toronto, has been summoned by the City Architect to appear in the Police Court. These are for putting up a building without a permit at 11 Leonard avenue, making alterations to the rear of 59 Yonge street, and removing the bottom storey of a wall at 158 York street, all without a permit.



# CEMENT AND CONCRETE

[NOTE—Contributions suitable for publication in this Department are invited from subscribers and readers]

## THE TREATMENT OF CONCRETE SURFACES

BY LINN WHITE, Chicago, Ill.

Next to form or design the character of the surface has most effect on the appearance of concrete, and the surface imperfections are due mainly to a few well-known causes, which may be summed up as follows:

1. Imperfectly made forms.
2. Badly mixed concrete.
3. Carelessly placed concrete.
4. Efflorescence and discoloration of the surface after the forms are removed.

Forms with a perfectly smooth and even surface are difficult and expensive to secure, badly mixed concrete gives us irregularly colored, pitted and honeycombed surfaces, and careless handling and placing produce the same defects. But the greater the care and the smoother the surface, the more glaring become minor defects. The fine lines of closely made joints in the forms become prominent, the grain of the wood itself is reproduced in the mortar surface, hair cracks are liable to form, and, worst of all, efflorescence and discoloration are pretty sure to appear.

Two methods suggest themselves as likely to overcome the defects alluded to above: (1) Treating the surface in some manner after the forms are removed to correct the defects, and (2) using for surface finish a mixture which will not take the imprint of and which will minimize rather than exaggerate every imperfection in the form and which will not effloresce.

The method most used in the South Park work to correct defects after the forms are removed is the acid treatment. It consists of washing the surface with an acid preparation to remove the cement and expose the particles of sand and stone, then with an

alkaline solution to remove all free acid, and finally giving it a thorough cleansing with water. The operation is simple and always effective. It can be done at any time after the forms are removed, immediately, or within a month or more. It requires no skilled labor—only judgment as to how far the acid or etching process should be carried. It has been applied with equal success to troweled surfaces, to moulded blocks and to concrete placed in forms in the usual way.

The treated surface can be made any desirable color by selection of colored aggregates or by the addition of mineral pigments. The colors obtained by selection of colored stone are perhaps the more agreeable and doubtless more durable.

Where there are projections or marks left by the moulds or forms they are tooled or rubbed down before treatment, and where it is necessary to plaster up rough places or cavities in the surface it may be done and after treatment cannot be detected.

The second method of preventing or minimizing surface defects has also been used in the South Park work with quite a measure of success.

During the year 1904 groups of concrete buildings were erected in nine different parks, costing, with their accessories, from \$65,000 to \$150,000 for each group. These buildings are all monolithic structures with occasional expansion joints, the exposed surface of walls being of a concrete composed of one part of cement, three parts of fine limestone screenings, and three parts of crushed limestone known as the 1-4 inch size. This was thoroughly mixed quite dry, so

no mortar would flush to the surface, and well rammed in wooden forms made in the usual manner. The result was an evenly grained, finely honeycombed surface, of a pleasing soft gray color, which grows darker with time and blends admirably with the park landscape. In placing it was not spaded next the form, it was too dry to cause any flushing of mortar, so there is no smooth mortar surface, the imprint of joints between the boards hardly noticed and the grain of the wood not seen at all. There is no efflorescence apparent on the surface and cannot be on account of the dryness of the mix and the porosity of the surface. The buildings are used as gymnasiums, assembly halls, reading and refreshment rooms, and as a rule the same gray concrete finish is given the interior walls as the exterior. In some cases color has been applied on the interior walls and the walls of shower and bath rooms have been waterproofed with plaster. The porosity of the surface makes it well adapted to receive and hold plaster.

This sort of surface is not capable of treatment with acid as a smoothly mortared surface, nor is it desirable. Consequently the only color obtainable is the natural color of the cement covered stone, but which is softer and far more agreeable than the gray of the usual mortar finished surface. It is not suited for the surface of a pavement and is not impervious to water. Although it is evident the water enters the pores to a considerable extent there is no evidence of injury from frost during the three winters some of these walls have stood.

The same finish has been used for retaining walls, arch bridges, fence posts, walls enclosing service yards, etc. In the buildings the thin walls were made entirely of this mixture,

while in the heavier structures it has been used only as a facing.

A dry, rich mix with finely crushed stone has been found specially suited to another condition where a sound, smooth surface was particularly difficult to secure, viz., for the under water portion of a sea wall on Lake Michigan. It was mixed very dry and dumped in mass in sunken boxes joined end to end, made fairly watertight, but from which the water was not excluded. With the finely crushed stone a sound smooth surface was obtained (when the sides of the boxes were removed), where it was manifestly impossible to plaster or grout the surface and where spading a mix

of coarser stone simply washed the cement away from the surface stones.

In both methods described honest work and careful inspection are as necessary for good results as in any other first-class construction. Neither method cheapens concrete work. The acid treatment slightly increases it. The surfacing with fine crushed stone adds nothing to the cost.

By the acid treatment, together with rubbing and chipping, all irregularities can be corrected. With the fine crushed stone surface all irregularities and form marks are not prevented but they are greatly minimized.—The Architects' and Builders' Journal.

## EFFECTS OF WATERPROOFING CONCRETE BLOCKS

The past six weeks' rainy season in Western Pennsylvania and Eastern Ohio has enabled the concrete wall builder in this locality the opportunity of studying the waterproofing problem better than any season since the concrete block has come into universal use, writes F. W. Hagloch, in the National Builder.

The fact that concrete becomes harder if left porous and kept moist than if waterproofed is being more realized as the new wall have been freely moistened by the rains while the buildings were under construction, and now we have concrete block walls less than three months old that surpass in hardness those made of the same materials on the same machines a year ago, which to the unobserving would seemingly contradict the theory that concrete hardens with age, but as concrete hardens with age much better under wet conditions, the walls built this season have had a greater amount of wet age before being waterproofed, and are, therefore, the strongest.

This season it is the opposite, as many buildings are now complete except the waterproofing, and in some few instances are occupied, and a few complain of moisture penetrating the walls to the interior. Little do they realize that this penetration adds to the durability of the concrete, and that after the waterproofing has been applied the hardening process of the

cement is reduced that it will require a year to add as much strength as would be added to porous concrete in one week of rainy weather.

This last point has been fully tested with briquettes, those waterproofed when seven days old had little more tensile strength at twenty-eight days or even ninety days old than the untreated briquette would show at seven days, while the untreated briquette at twenty-eight days would show nearly three times the strength as that of the treated (waterproofed) briquette of the same age.

The briquette made of concrete in which the waterproofing was added in the composition showed a much greater tensile test at seven days than the untreated, but fell short on the twenty-eight day test, clearly indicating that a chemical causing quick setting is used. Should the chemical be of a potash nature it will prove injurious to the concrete in three to five years. My opinion for this is based on the fact that in the potash room of a certain soap-making establishment the concrete floor must be renewed in from three to five years, and after such renewing the longer potash is kept from the concrete the longer the floor endures it. On one occasion the floor was used when three days old and the potash added to its hardness very noticeably within a week, but in less than a year a new floor was required, while a floor two weeks

old before using has endured for over three years.

Concrete will, without the use of any process, become waterproof in time and requires from three to twelve years, depending upon the nature of the concrete and the amount of dust carried against the wall by the winds. The effect of this was best shown where a concrete block house was built two years ago facing a street which became very dusty at times, the front of which became waterproof as well as of a groundish color within a year, and another house erected directly opposite a few months later is likewise waterproofed on the front only, thus disproving the theory that the south side of a concrete wall only became waterproof, as the first building faced the south, while the last one erected faced the north.

### JAPANESE CEMENT COMBINE.

We learn from a private source, says the "British Clay Worker," that four of the largest cement manufacturing firms in Japan have combined under the name, "Toyo Cement Kaisha." The total annual output of these firms is over 320,000 tons, or about a fifth of the total production in the country, and it is expected that this will be nearly doubled by the addition of two other large firms in the course of a few months. There is an enormous demand for cement at the present time in Japan, and the extensive harbor works due to the great development in the shipping trade which has taken place during the last few years will absorb still further quantities. These new harbors will take seven years to build, and will furnish work for a large number of cement factories, as in addition to the actual harbors there will be the warehouses, etc., to erect.

One of the worst accidents in the history of Port Arthur occurred in that town on October 29 when the large flour and feed warehouse, owned by Mayor Geo. Clavet, and situated on Court street, collapsed, burying nine men in the debris. One was killed and several others more or less seriously injured. The building had just been completed at a cost of \$18,000.



[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.]

**FACTORY LIGHTING.**

Under the above title a paper was read before the Ohio Electric Light Association meeting at Toledo last August by Mr. A. P. Biggs, in which it was pointed out that from the standpoint of illumination the lighting of factories may be divided into space and applied lighting. For general space and floor lighting there must be some large source of artificial light and the sources now available are the electric and gas arcs, the Cooper Hewitt and the Nernst lamps. The incandescent lamp in large sizes is still inefficient as compared with these others, and in ordinary sizes does not give the necessary illumination.

An arc requires minimum cost for installation, has the greatest efficiency per watt expenditure and lowest maintenance cost. The unsteadiness of an arc is not serious in space lighting, and while the shadows from a single arc are apt to be annoying, the arc on the whole is the best unit for such work as above noted.

The Nernst lamp is desirable in small space lighting in low ceiling machine shops and in foundries. In one instance, where the Nernst lamp is giving excellent results, the lamps are spaced from 8 to 10 feet apart at a standard height of 9 feet. The light is soft and pleasant and energy consumption low.

For particular application of artificial light single incandescent lamps are the sources used. Although the installation of a lamp at each machine in every kind of business is not sanctioned by all illuminating engineers, it has the sanction of custom, the recommendation of the wiring contractors and enjoys the hearty endorsement of those responsible for getting the same amount of work out of the machine by artificial light as is expected by daylight.

In a shop having low ceilings and much window surface, illumination may be good from natural sources for the first six months or so, but after that, by continuous process, the windows, ceilings, wall, posts, etc., blacken and cease to let in or to reflect any light. The lighting installation fares the same way and the workman shades his eyes by covering the lamps with anything he may happen to have at hand.

An example of shop practice with individual lamps—uncommon because definite data accompany it—was presented by K. C. Beech, before the Chicago Section of Illuminating Engineering Society in May last. A bare lamp, 13 inches above the face plate of a drill press, and 7 inches from the centre, gave 3.7 feet candles at the centre of the face plate. The dirtiest lamp in the shop when substituted gave 1.55 feet candles, while a new clean lamp in the socket gave 5.7 candles.

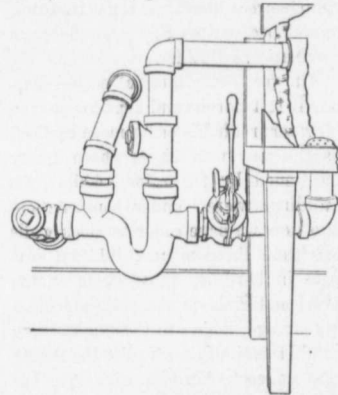
**A METHOD OF CLEARING WASTE.**

The fact that waste pipes from sinks, where cooking utensils and dishes are washed, get stopped up by crusts of bread, vegetables, coffee grounds, etc., has caused hotels, clubs and restaurant managers much annoyance, and many plumbers much study. The secret of keeping the waste pipe clear is to have sufficient outflow from the sink to insure full capacity of the waste (2 inches being the proper size), at the same time not to allow the refuse spoken of to leave the sink through the waste, necessitating its removal to the garbage can.

The custom has heretofore been to use a brass waste and stopper. In order to retain water in the sink, the stopper must be put in place and removed when it is to be emptied, thus preventing any protection being placed inside the sink except the regular

cross bar below the stopper seat. The cross bar, having large openings, allows the objectionable matter to pass into the waste pipe and cause the trouble. If a filter strainer is placed between the cross bar and the bottom of the stopper, it reduces the outflow to such an extent as to prevent the waste from being thoroughly scoured. In this way, the grease soon collects and helps to cause the trouble.

A simple device, as shown in the accompanying illustrations, obviates this trouble. It consists of a quick closing or sliding gate valve, operated by a lever, placed at one end of



the sink, the overflow being carried outside of valve. A convex strainer at least 6 inches broad and 1 inch high is placed over the mouth of the waste at bottom of sink. The strainer is sufficiently perforated with 3-16 inch or 1-4 inch holes, and the lower end all around is fluted, so that sink will thoroughly drain when required. A practical plumber will see the utility of this arrangement without further comment.

This device has been used in hotels and clubs with perfect success by the Rossman & Braeken Company, New York, by whom it was originated.—The Engineering Review.

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## ESTIMATING MILL WORK FROM BLUE PRINTS

By CHAS. CLONKEY, IN "WOODCRAFT."

Perhaps the most economical plan of making estimates from plans is to make a complete and accurate list at the start, so that in case the order is placed, the copy of the list furnished the buyer can be used by the superintendent or foreman in billing out the work. It may take a little longer in the first place, but it will save much time when it comes to getting out the bills.

### A ROUTINE SYSTEM NECESSARY.

Every estimator should have some routine system of taking off quantities from blueprints in order that he will not be liable to overlook some class of items and so that the billing clerk or foreman will be able to start at the first and bill out the whole job about in the order that it should be gotten out.

It is not necessary that the estimator should be able to make the cutting bills for the work he takes off the plans, for it is supposed that the plans, specifications and details will furnish all the information necessary to make out the preliminary list of items. However, if there is any doubt in regard to sizes or details, or if, as is often the case, the drawings and specifications do not agree, the estimator should submit the matter to either the contractor or architect, as the case may be, if he has the time and opportunity. If his time is too limited he should put down the size he thinks is right and follow it with a (?), which will give him the privilege of a change in price if he is wrong, and at the same time cause the factory to get a decision before the work is actually begun. The old saw, "Be sure you are right before you go ahead" is a very good factory saw.

### LISTING THE ITEMS.

The estimator will find it a great saving of time to make up his list of items before he begins to attach the prices. If he is continually vacillating between his blueprints and his price lists, he is not only liable to lose sight of some of the items on the plans, but his mind will not be able

to do the rapid work possible with a more sustained effort of concentration. If he is taking off frames, let him take off all the frames before turning to something else. If it be doors, make a complete list of the doors and their specifications.

Another practice is a good one. Bill the windows and frames separately, denoting the sizes of each, for this will act as a check and by comparing the two lists it will appear at once if there is an error. If the frame bill is made first and the window bill copied off of that, any mistake that has been made will be carried forward into the windows instead of being discovered and corrected. This practice is true of other items which might be duplicated in the same way.

Suppose we take a good sized brick building as a sample. We find that the first items needed on the job are the door and window frames for the basement or the first storey, as the case may be. Now, to follow out the idea already advanced, we will begin with the outside door frames at the bottom of the wall or basement, and put them down as indicated on the plans, basement first, then first floor, second floor, third floor, and so on to the top. For the convenience of the factory it is well to note at the right of the items the floor to which they belong. For the accommodation of these notations, the estimating sheets should be of a generous width, something like letter size, and in length about a foot. Usually the size of a door is given on the floor plan. If an outside door, the style may be seen from one of the elevations. If the door is not shown on the drawings it will be necessary to hunt up the specifications referring to it.

### A SAMPLE ORDER.

We will say that there will be an item of door frames like the following:

3 O S Plank Dr Fra 3-0 x 7-0 T 36 inches for 13 inch wall, rab 1 3-4—Basement.

If the construction is unusual, the notation (see detail) will be added,

but if it is of the ordinary type for which no detailed drawing is furnished, both the estimator and the superintendent will know how to handle it without further notes. The balance of the outside door frames on the job follow in their order from the bottom to the top of the building.

However, if there is a composite frame for a front or main entrance, all the openings entering into its makeup should be given in listing the frame, as follows:

2 Front Ent Frs, each to contain  
2 Drs 2-8 x 8-6  
2 Sd Lts 1-8 x 8-6  
1 Tran 5-4 x 24 inches  
2 Tran 1-8 x 24 inches (See details).

If there are no details for above frame, the jambs would be figured according to the thickness of the walls, the mullion jambs about 6 inches and the mullion casings about 4 1-2 or 5 inches wide. The transom bar would be plain with a moulding under the transom sill on the outside, and the distance from the top of the door to the bottom of the transom would be about 4 inches. Such a frame would be worth about the same as three door frames with transom bars, although they are usually put in about 50 per cent. higher on account of the fact that the bigger a frame is the more costly it looks, which is one of the advantages of the mill man.

If the large frame has a triple transom in the form of a circle, Gothic, segment or ellipse, it should have the attention of practical experience, for unless the estimator has a wide range of previous estimates to draw from, or is a man accustomed to getting out this kind of work, he will hardly be able to make a reliable guess.

After assembling all the outside door frames on the job, begin with the box window frames and take them off in the same way, listing as follows:

24 Box Wd Frs 36 x 24—2 lt. 1 3-4 sash (regular) or (see detail).  
4 Plank Sash Frs 24 x 36—1 lt. Opg 2-4 x 3-5

(Continued on page 22.)

# Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

## CONTRACTS OPEN.

### Calgary, Alta.

Plans have been prepared for the erection of a new six-storey hotel on Ninth Avenue.

### St. John N.B.

The authorities will likely build a brick boiler house for heating the interior of No. 5 berth.

### Peterborough, Ont.

The Charlotte street Methodists are contemplating the building of a \$30,000 church early in the spring.

### Tisdale, Sask.

The newly formed Tisdale Telephone Company will build a telephone system to New Osgoode, 18 miles distant.

### Baddeck, N.S.

The ratepayers have approved of a by-law for installing a water and sewerage system at a cost of \$25,000.

### Listowel, Ont.

Tenders are being taken by C. A. Lee, Chairman of the Light Committee, for the electric lighting of this town.

### Nanaimo, B.C.

A by-law is to be submitted to the ratepayers for the purpose of raising \$60,000 for extensions to the waterworks.

### Glenbow, Alta.

The Government have been forwarded a petition asking for the construction of a bridge across the Bow River at this place.

### St. Thomas, Ont.

A by-law for building an isolation hospital at a cost of \$10,000 will likely be submitted to the ratepayers at the municipal elections.

### Ottawa, Ont.

John Henderson, City Clerk, gives notice of the civic intention to effect various local improvements on Arthur street at a cost of \$2,500.

### Vermilion, Alta.

A new company has been formed to develop the clay land at Claysmore siding and the erection of a \$25,000 brick plant will shortly be commenced.

### Brandon, Man.

Architect Sinclair has received instructions to prepare plans for the

addition of a large rifle gallery to the new armoury at an approximate cost of \$5,000.

### Prescott, Ont.

Forty thousand dollars is to be spent upon the C.P.R. yards here this winter and an appropriation of \$100,000 has been made for the building of a new depot.

### Berlin, Ont.

The Kaufman Rubber Company, recently incorporated with a capital of half a million dollars, will commence next spring the erection of a large modern factory.

### Blenheim, Ont.

W. E. Biggar, Chairman of the Property Committee, wants tenders up to November 18 for heating the town hall by exhaust from the municipal electric light plant.

### Quebec, Que.

Considerable damage was done to property in the city by storm last week, the most serious item being the destruction of the Quebec and Levis Company's pontoon bridge.

### New Westminster, B.C.

The construction of a bridge to Lulu Island is now assured, \$10,000 having been granted by the Provincial Government towards the project, and plans are already in hand.

### Douglstown, N.B.

H. J. Chisholm, chairman of directors of the International Paper Company, together with several other prominent members of the concern, have been looking for a site in this district for the erection of a rossing mill.

### Owen Sound, Ont.

William Beaton, Clerk, Township of Derby, wants tenders up to November 28th for ten-year drainage debentures of \$282.66 each. Further particulars of Mr. Beaton, Box 39, Kilsyth, Ont., or of McKay & Grosch, Box 390, Owen Sound.

### Sandwich, Ont.

A report has gained considerable credence in financial circles at Montreal to the effect that the United States Steel Company have purchased property in this locality upon which they will erect a plant for the manufacture of structural steel and wire.

### Edmonton, Alta.

It is understood that work will commence this winter upon the construction of the high level bridge.

The construction of extensive improvements is the principal subject of discussion in the council. It is proposed to double the capacity of the power plant, also to build a new pumping station.

### London, Ont.

The Onward Manufacturing Company, of Menasha, Wis., are contemplating the establishment of a Canadian branch factory in this city.

At the January election the ratepayers will vote on a by-law to raise \$235,000 for transmitting Niagara power.

Johnston Bros., of Ottaway avenue, will erect a new three-storey bakery next spring at a cost of some \$20,000.

### Montreal, Que.

A block of land, 15,000 ft. square, on St. James street, has just been purchased by the Dominion Government, presumably as a site for a branch post office.

At a meeting of the directors of the Dominion Park Company held last week it was decided to immediately proceed with the work of reconstructing the park buildings. It is expected that the work will be completed by May 24th.

### Winnipeg, Man.

The Chairman of the Board of Control will receive tenders up to December 2nd for supply and installation of pumping and air compressing machinery for well No. 7, and up to the same date for construction of pavements, sewers and other local improvements; specifications at office of City Engineer.

Architect J. D. Atcheson, Canada Life Building, is completing plans for a large apartment block on Portage avenue and Maryland street.

### Victoria, B.C.

Director Gifford, of the B.C. Electric Railway Company, states that his company have formed a plan for the installation in the near future of a new water power plant for the city.

Tenders are invited by Fred Gelinias, Secretary, Department of Public Works, Ottawa, up to December 2nd

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for the construction of a Detention Building in this city. Plans at office of Wm. Henderson, resident architect, Victoria, and at the Department at Ottawa.

A permit has been granted to Hon. James Dunsmuir for alterations and additions to his residence on Craig-tower road; estimated cost \$60,000, J. S. McClure, architect.

#### Vancouver, B.C.

The Exhibition Association are looking for a site and a committee has been appointed to open up negotiations with the city council.

Plans have been prepared for the erection of a \$100,000 office building on the corner of Carrell and Hasti-g streets for the B.C. Electric Railway Company.

Recent building permits include: F. J. Fessant, frame dwelling, Victoria street, \$1,500; A. H. Bradbury, concrete store and apartment flats, corner Davie and Denman streets, \$5,500; J. A. Gray, frame dwelling, Seventh avenue, \$1,500; S. D. Harper, frame dwelling, Third street, \$1,400; Vancouver Furniture Manufacturing Co., frame shop, Dufferin street, \$1,400; J. Anderson, frame dwelling, Park drive, \$1,500; M. Gormley, frame dwelling, Burrard street, \$2,000; Donald MacLennan, excavation for foundation, Richards street, \$1,200; J. B. Abernethy, frame dwelling, Ninth street, \$2,000; Yates and Hicks, frame dwelling, corner McLean and Willis drives, \$2,000; Jean Calvarie, frame dwelling, Venables street, \$2,000; Thomas Angus, frame dwelling, Sixth street, \$1,800; D. Williams, tenement house, Nelson street, \$12,000; Henry Hutching, frame dwelling, McLean drive, \$1,900; Frank Graham, frame dwelling, Bridge street, \$1,600; Alonzo Ward, frame dwelling, Tenth avenue, \$2,200; J. H. Elliott, frame dwelling, Fourth avenue, 2,000; F. Baynes, alteration to dwelling, Barclay street \$4,000; G. H. Crane, First avenue, frame dwelling, \$2,900; Alberta Lumber Co., bunkhouse, Heather street, \$2,000; John Ganler, repairs, Richards street, \$2,000; Wright & Fraser, frame dwelling, Venables street, \$1,700; J. A. McConkey, double dwelling, Fourth avenue, \$3,000; Robert Wallace, frame cottage, Charles street, \$1,600; E. C. Britton, frame dwelling, \$1,800; Penzer & Bell, frame tenement; Powell street, \$3,500; Allen Bros., dwellings, Manitoba street, \$6,000; James Miller, frame dwelling, Eighth avenue, \$3,600.

#### Toronto, Ont.

Plans have been received by the License Commissioners for the rebuilding of the Jackson Hotel, corner of Brunswick avenue and Bloor street.

Francis Crittel, steel magate, of London, England, has been instituting detailed enquiries with a view to the establishment of a large industry in this city.

Samuel, Benjamin & Company, wholesale hardware merchants, have purchased property corner King and Spadina upon which they purpose erecting a large warehouse and office building.

The Chairman of the Board of Control, Mayor Coatsworth, will receive tenders up to Nov. 19th for sewer construction on Glen road, Edgar avenue, Schofield avenue and Highland avenue. Specifications at office of City Engineer.

Several lots of the Wychwood property, west of Bathurst street and north of Davenport road, are reported to have been sold for building purposes. The erection of a house for Mr. Eden Smith, the architect, has already been commenced on the corner of Braemore avenue and Eden street.

Recent building permits include: S. F. McKinnon, alteration to warehouse, York street, \$3,000; Jas W. Hewitt, 2½-storey brick dwelling, Roncesvalles avenue, \$3,500, D. Todd, four attached 2½-storey roughcast dwellings, Jones avenue, \$5,000; A. Hewett, 2-storey brick dwelling, Oriole road, \$3,500; Davis & Moore, pair 2-storey semi-detached brick veneered dwellings, Margueretta street, \$3,000; T. E. Essery, 2-storey brick factory, Britton street, \$20,000; Jas. Lochrie, 2-storey brick dwelling, Symington avenue, \$3,000; Frank H. Fleer & Co., 2-storey reinforced concrete factory, Sterling road, 65,000; Geo. Gamble, 2-storey brick store and dwelling, College street, \$6,000; Chas. H. J. Snider, 2-storey brick dwelling, Geof-fry street, \$3,000; E. Hamblin, 2-storey brick veneered dwelling, Hampton avenue, \$1,500; H. S. Mara, pair 2-storey semi-detached brick dwellings, Bloor street, \$3,000.

#### CONTRACTS AWARDED.

##### Battleford, Sask.

The successful tenderer for the building of the new power house was W. J. Broley, at \$6,000.

##### Peterborough, Ont.

W. J. Martyn, of this town, has obtained the contract for the addition to May's school house.

##### Ottawa, Ont.

The Iroquois Iron Works, Buffalo, have obtained the contract for the municipal paving plant at \$14,800.

##### Montreal, Que.

The Robb Engineering Company, of Amherst, N.S., have been awarded the contract for installing three new boil-

ers to the wheelhouse at Point St. Charles.

##### Quebec, Que.

Contractor Boivin, of this city, was the successful tenderer for the building of a fire station in St. John's Ward, at \$20,985. Other bids were N. Breton, \$21,900; E. Cote, \$23,000, and P. de Courcy, 25,600.

##### Toronto, Ont.

Purdy, Mansell & Co., this city, have been awarded the contract for the heating, plumbing and ventilating of the new normal schools at Hamilton, Stratford, Peterboro' and North Bay. Fred Armstrong & Co. have the electric wiring contract for the same buildings. Total cost about \$62,000.

#### FIRES

Catholic church, Fort William, Ont., loss \$15,000.

Stave mill of Greenlees and Kennedy, Forest, Ont., loss \$6,000.

Longue Point church, Montreal, Que., total loss \$75,000.

Buildings of Joseph Constant, Merchant's Awning Company, J. V. Boudrias and J. Larue, Montreal, Que., loss \$30,000.

G. T. R. depot and freight shed at Londesboro, Ont.

Furniture store of George Shepperd, Norwood, Ont., loss \$20,000.

Farm house of George Downey, Wellwood, Man., loss \$1,500.

Evan's planing mill and lumber yards, Sudbury, Ont.

Anderson and Macbeth Building, Bay street, Toronto, Ont., total loss \$87,000.

Buildings at Dominion pleasure park, Montreal, Que., loss \$200,000.

Cheese and butter factory of A. E. Brown, Salisbury, N. B., loss \$5,000.

Grand stand of Montreal Baseball Club, Montreal, Que., loss \$4,000.

Planing mills and factory of Sud-bury Builder's Supply Company, Sud-bury, Ont., loss \$50,000.

Flour mill of J. Purdy, Magnetawan, Ont., loss \$7,000.

#### BIDS.

##### Vancouver, B.C.

The following tenders have been submitted for the construction of the market building: Layfield and Williams \$25,235; C. P. Shindler, \$26,000; E. Cox, \$27,600; McPherson and Sinclair \$27,900. The Market and Industries Committee have finally recommended the location of the proposed building at False Creek.

John Davis, civil engineer, of Alton, Ont., has succumbed to his injuries recently received at Kelly's crossing, on the C.P.R.



**NEW COMPANIES.**

Bell Furniture Company, Limited, Southampton, Ont., incorporated, capital \$50,000. Incorporators, Thos. Bell, H. O. Bell and Charles M. Bell, of Wingham, Ont., and Jas. H. Spence and W. W. Davison, of Toronto.

Rugg Ball Manufacturing Company, Limited, Waterville, Que., incorporated to deal in farm implements and machinery, capital \$20,000. Incorporators, J. R. Ball, of Waterville, Que., F. A. Rugg, of Greenfield, Mass., H. D. Lawrence, Wm. Morris and A. F. Plant, all of Sherbrooke, Que.

H. W. Petrie, Limited, Toronto, Ont., incorporated as manufacturers of machinery, capital \$400,000. Incorporators, A. Fasken, G. H. Sedgwick, A. T. Struthers, W. H. Sims and C. E. Stonehouse, all of Toronto.

The Challenger Athletic Goods Company, Limited, Toronto, Ont., incorporated, capital \$25,000. Incorporators, Wm. Challenger, of Toronto; F. G. Coates, Nelson Kelchum, E. E. Combs, of Brooklyn, N. Y., and others.

Sudbury Opera House Company, Limited, Sudbury, Ont., incorporated, capital \$50,000. Incorporators, J. H. Morin, Laurence O'Connor, S. E. Wright, Max Rothschild and David Jacobs, all of Sudbury.

Mutual Contracting and Realty Company, Limited, Toronto, Ont., incorporated, capital \$100,000. Incorporators, F. E. Cantwell, W. L. Dingle, James Payne and others.

Bell Furniture Company, Limited, Southampton, Ont., incorporated, capital \$50,000. Incorporators, Thomas Bell, H. O. Bell and Charles M. Bell, of Wingham, Ont., and Jas. H. Spence and W. W. Davidson, of Toronto.

Fleck Bros. Limited, Ottawa, Ont., incorporated as lumber dealers, capital \$49,500. Incorporators, A. W. Fleck, B. W. Fleck, Wentworth Greene and others.

St. John Foundries, Limited, St. Johns, Que., incorporated, capital \$30,000. Incorporators, Joseph A. Nadeau, of Herville, Que., and G. C. Poulin, J. A. Gagnon, Ulric Demarais and G. Guillet, of St. Johns, Que.

Orchard Grove Land Company, Limited, Montreal, Que., incorporated, capital \$49,000. Incorporators, James McBride, F. C. Orr, John Findlay, J. J. Meagher and James E. Goulin, all of Montreal.

Robert L. McCulloch has been recommended for the position of City Electrician of Vancouver, vice J. A. McCrossan resigned.

**BUSINESS NOTES.**

The county of Peterborough has disposed of twenty-year debentures amounting to \$4,000, bearing interest at 4 per cent, to Wood, Gundy and Company, of Toronto.

Wood, Gundy and Company, Toronto, have purchased \$15,000 five per cent. 15-year debentures of the counties of Prescott and Russell. This issue is considered a good one as the debenture debts amount to only \$48,000 against an assessment of \$6,400,000.

The tightness of the money market was well illustrated last week when \$1,500,000 Vancouver City bonds were disposed of at 85 which is absolutely the rock bottom price of Vancouver's debenture record.

Adamson and Sparrow, architects, of Montreal, Que., have registered.

A new lumber firm has been registered at Aston Junction, Que., by Joseph Audet and L. G. Heon.

It is reported that Ignatz Wey, builder, of Berlin, Ont., has assigned.

La Compagnie de Construction, real estate, builders etc., Montreal, Que., have registered.

**BUILDING NEWS.**

Building permits issued at Fort William, Ont., for the current year up to the end of October amounted to \$732,408.

It is reported that advocate Davidson, of Quebec, will enter upwards of fifty actions for damages against the Phoenix Bridge Company on behalf of those connected with the victims of the bridge disaster. The amounts range from \$10,000 to \$20,000.

A clear gain of \$1,507,360 is recorded in the civic building department of Vancouver for the first ten months of the year over the corresponding period of last year. The figures are: 1907, \$4,607,580; 1906, \$3,100,220. Last month's permits totalled \$331,950 against \$293,425 for October 1906.

At a meeting of the commission appointed to enquire into the working of the Compensation for Workmen Act held last week in Montreal, several amendments were suggested by the deputation of the Manufacturers' Association. While in the main upholding the stand taken by the Builder's Exchange with regard to employers and their liabilities, they made the following suggestions:

That a stated allowance be given for loss of limbs and permanent disability of a minor character; the compensation awarded for such injuries to be computed in proportion to the indemnity due for loss of life as based on the scale of indemnities in use by accident insurance companies.

That employers shall not be held responsible for any accident to an employee which has been caused by—

(a) Said employee being under the influence of liquor or drugs.

(b) By known bodily infirmity, such as epilepsy, etc.

(c) By the employee's own criminal or wilful act.

That provision be made to secure to the victim or to the victim's family the compensation due them from an accident, and thus prevent the amount from being seized for any debt incurred prior to said accident.

That provision be made so that the compensation due an injured employee shall rank for payment as wages due, in case of the employer becoming insolvent.

The people of Edmonton, Alta., seem to be on the verge of getting their long-looked-for high level bridge. William Whyte, second vice-president of the C.P.R., says that all arrangements have been made and that the men will start work on the substructure this winter. The bridge will be 2,500 feet long and will cost in the neighborhood of a million dollars. When completed the structure will afford for the first time easy and direct communication with Strathcona.

Speaking of C.P.R. line progress in the west, Vice-President Whyte states that the scarcity of railway ties has proved a great draw-back during the past season. He thinks however that the difficulty is about at an end and that there will be a full supply of ties for next year.

In order to carry out much needed public works the town of Medicine Hat, Alberta, rather than sell the municipal bonds at a sacrifice, is contemplating a mortgage on its gas and water works system.

A new regulation, which, if it comes into force on January 1, bids fair to revolutionize building construction in New York, has been unanimously adopted by the building code revision commission of that city and provides that—no new building shall be over 250 in height.

Great damage was wrought to property last week at Quebec by a terrific hurricane which lasted five hours and attained a velocity of one hundred miles an hour. On the morning after the storm masses of debris were strewn about the streets and many wooden out-buildings were raised bodily from the ground. The Quebec and Levis Ferry Company's bridge was carried across the river and completely wrecked. Altogether the damage amounted to about \$15,000.

## THE FACTOR OF COST IN ESTIMATING.

(Continued from last week's issue.)

Perhaps the best way to do is to figure up what the probable overhead charge will be for one year, due allowance having been made for exceptional conditions, so that you are reasonably sure that the allowance made will more than cover the actual overhead charge, then determine how many working days this charge should be divided into. For instance, there are three hundred (300) working days in a year. You figure that you lose during the year 30 days, due to lack of work and inclement weather. Therefore, to find what the overhead charge is per day, divide the estimated overhead charge per year by 270 and you will have a reasonable charge per day. Care should be then taken to open an account in your books to overhead expense, and charge all these items up to that account so that you can tell at the end of the year just what this item of expense has cost you. By comparing this item to the total cost of labor and material for the year, you can readily determine what percentage should be added to the cost of labor and material in order to get the actual cost of the work.

It will generally be safe in figuring work for the following year to add to the estimated cost of labor and material the percentage as figured above. But the cost of this expense item should always be carefully kept, year after year, to see that you are adding the correct amount to your labor and material, and also see that it is not running higher than usual.

Now, having arrived at a percentage to be added to labor and material for this item of expense, if you want to get the actual cost of any part of your work keep an accurate account of the labor and material used on that work, and then add the percentage and the result will be the actual cost to you and the cost upon which your percentage of profit should be added.

The next step in your cost recording system is to divide your contract up into different items, so that they may be numbered and a cost kept of each. For instance, an ordinary

frame house may be divided into items as follows:

- First, wall plate;
- Second, first floor joist;
- Third, first floor studs;
- Fourth, outside studs;
- Fifth, second storey joists, etc.

Care must be taken to have this division into items so done that it covers every item in the contract. A copy of this list is made and given to the foreman with instructions to charge the time of the man to the items as shown on the list. When the time comes in and is entered on the proper cost card and you have added the proper percentage for overhead expense, you have in hand the cost of every item on your list. You must now devise some way of examining these costs to compare them with other costs of similar work and to satisfy yourself that the work has been economically done. That is, for example, in laying joists, studs, roof, rafters, etc., determine what the labor cost per thousand feet of lumber is and also per hundred square feet of surface. Do the same with the nails, bolts, etc. Then by comparing the results with the results of the same work under another foreman on a different building you can tell at once if the work has been economically done, and at the same time you can get an average that will be safe to use when estimating on similar work in the future. If for any reason it happens that any of these items should be made larger or smaller than usual on any specific work a careful memorandum should be made to explain this fact so that it will not misguide you on other work. For instance, if you have a job where there is no framing on the joist and they are just the right length so that no cutting of the ends is necessary, and you compare the cost of this work with other costs of apparently similar work, you will find that the labor per thousand feet will be much too low, or if there is a great deal of framing and cutting the labor will be extra high. If, however, notation is made on your record to explain this, the result will be that you will come to three conclusions:

First, the cost of labor per 1,000 feet when there is lots of framing, etc.

Second, the cost of labor per 1,000 feet when there is the ordinary amount of framing.

Third, the cost of labor per 1,000 feet when there is no framing at all.

It is then left to the judgment of the contractor in estimating work to determine which price he should use.

In order to make your cost recording system complete you should prepare ruled forms upon which should be entered a list of the things with regard to specific information wanted, and then see that the information is properly entered. By referring to this sheet you can find at once the cost record of all work of that nature done since the method was installed, and you have all information necessary to guide you in estimating on future work.

In order to illustrate the method outlined above I have prepared some large sized sheets ruled to make it convenient to keep these records:

- First, a time sheet;
- Second, a cost sheet;
- Third, a tabulated cost sheet.

The time sheet should be kept by the foreman and turned into the office by him at the end of the week.

The cost sheet is kept at the office and the labor and material as it is turned in is entered on this cost sheet. After that specific article is completed it should be figured and recorded on this sheet.

The tabulated cost sheet should also be kept at the office, and the information derived from the individual cost sheet should be transferred to it, care being taken to see that every item is filled in. This tabulated record is used simply as a matter of comparison and will become of the greatest value to the contractor as more and more information is compiled. To properly illustrate the tabulated cost sheet I have prepared one for floor joists which will illustrate what is meant.

The same ruling may be used on tabulated records of all kinds simply changing the headings.

You will readily see the value of this tabulated record in comparing costs of the same kind of work done by different foremen and at different times, and under different conditions.

These sheets can be punched and filed and indexed so as to be easily found.

## SASHES AND FRAMES.

It will be observed that it is not necessary to give the window opening of a regular check rail window. With a given glass size the opening in the frame is always the same, no matter where made, and so universal has become the use of the check rail window that unless otherwise specified an order for a window 1 3-8 or 1 3-4 thick will always be entered up and made as a check rail window. So it is the custom to omit the specification of "chk rl" or "chk" when listing windows from the blueprints.

But with sashes it is different, on account of whether they have bottom rails 2 or 3 inches wide, and if the inside of the frame is to have the regular trim, including stool to lap over the sill, the bottom rail of the sash should be 3 inches wide, the same as that of the windows.

There is a twofold object in making sure that the sash will fit the frames. One being the check of the sash against the frame, and the other the avoidance of uncertainty in making the cutting bills, which consumes valuable time in looking up the true status of the items in question. And it is the same with a hundred little notations which may be jotted down with profit here and there along the estimate list. Perhaps there arises some perplexing question which requires considerable time and mental effort to clear up and which will be soon forgotten unless some little key to the situation is jotted down on the list. Then when the estimator is approached by some inquirer who has not studied it out, he will be able to recall all the points at once and impart the desired information without delay. He should list every job just as though the order had already been given and as though he had but one chance at the set of plans.

## WINDOWS AND GLAZING SPECIFICATIONS.

After listing the outside frames, it is well to list the windows next, and if there are any inside windows, let them immediately follow the outside, with the notation that they are inside, or he will be trying to make them check up with the outside frames. After the windows should come the sash, giving the glass sizes and the open-

ing sizes both, then following with the transoms, which will be 2 inch sash all around unless otherwise specified. The inside transoms should be so marked in order to check against the inside door frames having transome bars.

The dimensions of transoms are given in feet and inches for width and in inches for height, for example:

1 Tran 3-0 x 28 inches, would be the sizes outside of the sash.

It is the custom among sash and door factories to give the glass size of sash in inches and the opening size in feet and inches, as: 1 sash 22 x 32, opg 2-2 x 3-0, or if the bottom rail was 3 inches the opening would be 2-2 x 3-1. However, it is not a safe plan to depend upon lumber yards, contractors and carpenters to adhere to this rule. Many of them are not aware of its existence, and the only safe method when the notation does not accompany the order is to wait until it can be obtained.

While it is the custom of some mills to bill each opening or each set of identical openings complete, including frame, window and inside finish, practically all in one item, it is so very inconvenient if the list is to be used as a working bill, that no up-to-date manager would allow the practice. The estimator can further save time for the mill if he will begin and list the doors which he knows the mill will have to make all together, and follow with those kept in stock.

Notations covering the required specifications for glazing all the windows, sashes and doors should be entered on the list in their proper places, as it is usually an element largely affecting the cost of the items in question, and again will prevent the necessity of the glazier hunting up the specification when the open sashes come to his department.

The above is especially true when the sashes are to go out open, or are to be glazed with art, plate or obscure glass, for in the absence of any notations on the bill, the sashes are apt to be filled with plain glass before any one who is wise is any the wiser.

## DOOR FRAMES.

The next section of millwork on the job will be the inside door frames, or jambs as they are commonly desig-

nated, and if there are no details, the width of the walls should be given, the thickness of the jambs themselves, whether rabbeted or plain, size of transome, if any, and depth of transome bar, as follows:

25 I S Dr Fras 2-8 x 6-8—Tr 2-8 x 24 inch Rab 1 3-8—3 inch Bar.

If there are many sizes and the specifications fill more than a line of the paper used, it is just as well to leave the specification relating to the thickness of the jambs and the depth of the transom bar until the end of the list and then put them down with some distinguishing mark, as a ring around the note or a heavy underscore, so that the feature may not be overlooked. It is rather an expensive experience to get out a set of jambs for a large building and then have to go to work and get out another set a little different.

If the jambs are plain, that is, have no rabbet for the door to hang in, it will be necessary to figure stops either in connection with the jambs or the casing finish.

It is a good custom to bill the inside finish, excepting the item of door jambs already mentioned, as so many sides of trim. This should be divided into window trim and door trim, and following the items or number of sides of the various sizes required on the job should be a specification as to what comprises a side of trim for each class. Taking the numbers from the Chicago moulding book for an example, we might specify as follows:

One hundred and fifty sides door trim consisting of Nos. 8342, 8410-11-12-13. Base blocks round edge, or they can be given in any required number, as base blocks are not listed in all the catalogues in the same numbers the same as mouldings.

Forty-five side window trim for 36 x 40 2 lt wds, consisting of Nos. 8438, 8084, 8269, 8379, 8060, 8410-11-12-13.

(To be concluded in next week's issue.)

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**LOSSES FROM RUST.**

In popular estimation iron is an everlasting metal, yet it is, to quite a remarkable extent, a subject for disintegration and decay. Upon this theory only can the vast and constantly increasing producing and consumption of the metal be explained. Through chemical action enormous quantities of iron and steel are being reduced to the form of oxides. More iron rusts out than wears out. Scientific estimates made in England determine that the rails of a single railway system in that country, the Lon-

don & Northwestern, lose eighteen tons daily, the larger part of this loss being ascribed to the action of rust. With this as a basis some idea may be secured of the enormous loss that rust causes the railways of this country.

The rusting of iron and steel can be prevented only by protecting them from the action of air and moisture. This is accomplished by the frequent and free employment of some form of paint, a very expensive undertaking, and one that is never at an end, since to insure protection metals must be

frequently repainted. Fully \$10,000 a year is spent in painting the great Scotch bridge over the Forth. Late experiments indicate that pure iron in the presence of pure oxygen does not rust. It appears to be necessary for the production of rust that some acid, notably carbonic acid, shall be present. When iron is subjected to the action of water containing traces of acid, and in the presence of atmospheric oxygen, it always rusts. The rapid rusting of iron in railroad stations is ascribed to the presence of sulphuric acid derived from the smoke of locomotives.



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**RAPID FACTORY CONSTRUCTION.**

A building contract notable for the time in which it was executed considering the amount of work which had to be done was that of the lamp factory recently finished for the General Electric Company, at Newark, N.J. The building covers an acre, and is one storey high, but the foundations and lower walls were made strong enough for three storeys to be added later. On April 24 ground was broken by the contractor, Salmond Brothers Company, Arlington and Newark, N. J., and on May 23 the building was finished and the machinery was being installed. The elapsed time was 29 days, and there was no night or Sunday work, and the skilled labor had a half holiday on Saturdays.

A condition which developed caused the architects to grant the contractor an additional week over the time originally specified, but it was not required. The footings were designed for a depth of 4 feet 6 inches, but because the site had previously been occupied by a tannery and it was necessary to excavate large quantities of tan bark, these footings had to be made 16 feet deep in places. In spite of this handicap, the work was completed two days ahead of the original contract time without taking advantage of the extra week allowed for the deeper foundations.

The provision in the specifications that the foundations and walls of the first storey should be strong enough to allow three additional storeys increased the difficulty of the contract. This, with the limitation of the ultimate pressure on the soil to 5,000 pounds per square foot, made much heavier work necessary than would have been the case on the one storey factory building.

The cost of the factory was approximately \$50,000, and in one week of five and a half days the pay roll amounted to \$6,000. About this time 400,000 bricks were laid in 11 working days, or an average of 36,000 bricks per day. The force included 280 men, under the direction of four mason foremen, four carpenter foremen and four labor foremen. Two timekeepers were continually employed, and one of the contracting firms was always present. When it is con-

sidered that no night work was done, it will be seen that the two timekeepers were an extra precaution, showing systematic cost keeping methods.

Aside from the large working force, the factor that probably contributed most to expeditious construction was the purchase of materials locally. The common Jersey hard brick, long leaf yellow pine, Portland cement, window frames, trim, and, in fact, all materials were purchased in Newark for immediate delivery, and were trucked to the job. It is frankly admitted by the contractors that the response to their personal appeals to local business acquaintances resulting in prompt deliveries, enabled them to accomplish the work in record time, for the season was one in which slow deliveries prevailed on all building materials.

An arrangement that materially helped to hasten the construction of the roof was the allotting of the work to two separate roofing contractors. One employed men from a Newark labor union, and the other men from a Brooklyn labor union. These two gangs worked simultaneously each on one-half of the roof, and the good-natured rivalry between them was largely responsible for completing the work speedily. While this was going on a 4 inch tar concrete floor was being laid. The temporary roof of hemlock, with its final covering, and the concrete floor were all finished within four days.

Throughout the factory standard mill construction was used. The girders rest upon post caps of the usual type. The posts are 14 x 14 inch; the girders, 16 x 16 inch, and the bears, 10 x 16 inch in unfinished size—that is, before planing. The sleepers for the 1 1/4 inch maple floor are of 3 x 4 inch long leaf yellow pine embedded in concrete and spaced 18 inches between centres. All mortar was made of lime and Portland cement, and the windows and door sills are of dressed bluestone.

A strong application of ordinary spirits of camphor will remove almost any kind of polish or varnish. Give the spirit time to evaporate before repolishing, or it will injure the new polish.

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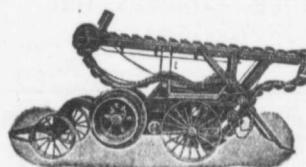
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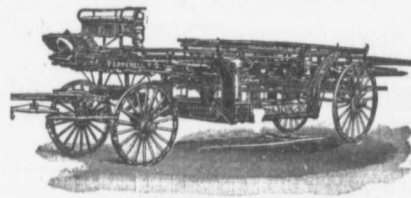
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"For large modern industrial plants, where electricity is used for the rest of the plant, the electric elevator is the only one," writes E. R. Carichoff in the "Electrical Review." "The motor and hoisting gear can be placed in any location adjacent to the elevator shaft. If such space is not available it can be placed at the bottom of the shaftway or at the top, immediately over the shaft. This flexibility of its location, as well as the possibility of bringing the power to it at a low cost, makes it more advantageous for such plants than any other.

"Where electricity can not be conveniently obtained but shafting is operated near the elevator shaft, an elevator driven by belts is used. This elevator is the same as the direct connected electric drum elevator with the motor replaced by belt pulleys, which can be connected to the shafting of the factory.

"Some electric elevators are made to be placed either on the floor or on the ceiling as is most convenient. Belt machines are likewise arranged in this manner.

"The electric elevators have almost entirely superseded the hydraulic elevators for industrial plants, and have many advantages over the latter. In the first place, they can be operated for about one-third the cost of the hydraulic. They have not the disadvantage of water leaking or freezing; they take up considerably less space, and do not require any special plant for their operation, as the current can be taken from any available electric power or light supply. They can be connected to the same circuit as the lights and have no effect on the latter.

"The hydraulic system requires a special pumping plant, which must be in operation whenever the elevators are to be used. They make necessary the placing of large, cumbersome and intricate piping.

"The electric elevator takes current approximately in proportion to the load it lifts, and has part of the load it lifts counterbalanced. In other words, they are run on the over-counterbalance system and they are very economical; the hydraulic elevator takes maximum power no matter what the load in the car may be; and as the pressure of the hydraulic system and the size of the cylinders must be arranged to lift the maximum load, and the average load is seldom more than one-third of this maximum, two-thirds of the power they consume is wasted.

"In installing elevators for factories, frequently one of the requirements is that the elevator will be so arranged that it can be operated from the different floors, even though the car may not be at the floor; and also locking device may be installed, that it may be held permanently at the floor while loading or unloading material.

"Where this requirement is to be met the car is operated by means of a hand rope running from the top to the bottom of shaft, and a safety which, by releasing a latch on the lock, after the car has been started in either direction, will automatically bring the car to a stop level with the next landing or floor.

"If the car is to be used from that floor, the lock is left in the latched position and it can not be taken from that floor by pulling the hand rope from any of the other floors. If it is desired to leave the elevator free to be called to any other floor, the lock is unfastened and the car can be moved by pulling the hand rope. In addition to the convenience of this device, it also adds materially to the safety of the elevator, which in factory elevators, as well as in all others, is the first and most important of all considerations. The doorway openings from the landings into the elevator shaft should be protected by semi-automatic gates. These gates protect the opening to a height of about five feet, and should be arranged so that they can not be raised unless the car is opposite the landing, and so that they will automatically return, to protect the opening, when the car leaves the landing.

"While the full automatic gate has been used in the past, it is dangerous. The danger with the full automatic comes from the fact that the car in its upward or downward travel, raised the gate as it approaches the floor, that is, the movement of the car automatically, at the proper time, moves the gate. This movement is liable to occur when some one is against the gate of the landing above the car.

"The full automatic gate is also closed by the movement of the car, and is liable to strike any one standing in the doorway, or push him into the elevator shaft. While a semi-automatic gate and the safety locking device afford adequate safeguards when the elevator is operated by means of a hand rope, still it would be better if factory owners could persuade themselves to adopt in all cases the electric machines and complete electrical control instead of rope-controlled elevators, as these devices have almost entirely superseded hand rope mechanical elevators for all other classes of service."

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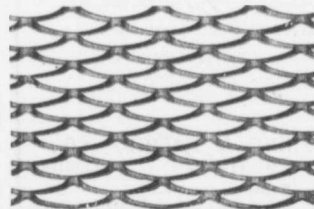
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(Abstract from "Specifications for Portland Cement," issued by the United States Navy Department, June 12, 1905.)

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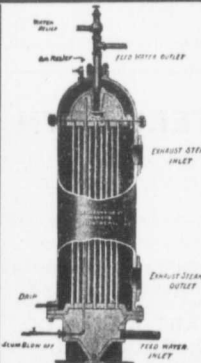
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A leading concrete and cement expert of New York City, when recently interviewed, made the following statement: "It is my belief that in ten years from now there will be 50 per cent. more concrete blocks used in the United States than brick. One reason for this is that it is so much cheaper than other substances used in the building trade. A building built of concrete blocks has a much more substantial, though not heavier, look than brick. It has been proven beyond doubt that it will withstand fire twice as well as brick, providing the blocks are made from the proper proportions of material.

"An example of this came under my notice at a recent fire in New York, in which three buildings were utterly demolished. The building in which the fire started was used as a paint warehouse, and was built of reinforced concrete blocks and reinforced floors. After burning for five hours the building did not show a crack, although everything in the interior was burned to a cinder. The building adjoining, which was built of pressed brick, collapsed after burning for less than two hours.

"I think concrete is also a much better retainer of heat. This fact alone should appeal to the builders and contractors of this western and northern country."

A few weeks ago in London, England, a man deliberately approached a plate glass window in a tailor shop, and taking a large stone from his pocket, hurled it through the show window, smashing it to pieces before a policeman standing near could stop him. On the trial of the man it was stated that it was reputed to be the largest sheet of plate glass in the world. It was 21 feet 3 inches long and 9 feet 6 inches wide, over a quarter of an inch in thickness and weighed nearly a ton.

It took three months to make and required the united efforts of 40 men to fit in place. Fortunately it was insured.



**POLISHED HARDWOOD FLOORS.**

It is an unusual thing to find a modern house which does not have hardwood floors in at least some of the rooms. A fitted carpet is a thing of the past in most homes. Keeping hardwood floors in prime condition is necessary to their cleanliness and beauty. To have them attended to by an expert is an expensive matter, and it is therefore necessary for the majority of people to know something about this process. It is far cheaper in the end to have good materials used upon floors, even though applied by unskilled labor, than it is to employ workmen who will guarantee to do the entire job cheaply, and who will therefore use inferior materials.

If a floor has never been correctly finished and is rough or sticky in places, the only way to treat it is to completely take off the original stain by means of a good solvent, which will soften it and permit it to be rubbed off. A steel wool will best accomplish the removal of every bit of color and will usually leave the floor looking like new wood. Next, a first-class filler should be applied. This will fill up the pores and grain of the wood and induce a smooth, hard surface. Wax should be applied slowly with a cloth and within a few minutes the floor should be polished by means of a weighted brush, which is far superior to cloth for this purpose in producing a brilliant finish. The wax comes in light or dark, and should be selected with regard to the final result required—a dark or light finish.

If this process be carefully followed and the work done slowly and thoroughly, it will insure a fine looking floor and one which can be easily kept clean; its brightness may be preserved by merely applying wax, and polishing once or twice a year.—“Hardwood Record.”

**TOO MUCH TO REMEMBER.**

Addressing the University Engineering Society on “Railway Accidents,” Mr. J. H. Hall, of the Ottawa Railway Union, stated that railway conductors and engine drivers were over-taxed with things to remember. His opinion was that the block system should prevail on all Canadian lines.

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Buff No. 1.....	17 00
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Roman Red.....	30 00
" Buff.....	35 00
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Hard Building.....	8 00
" Sewer.....	7 00
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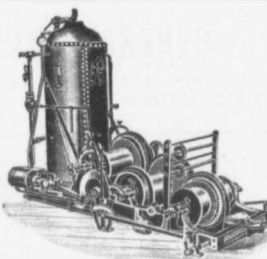
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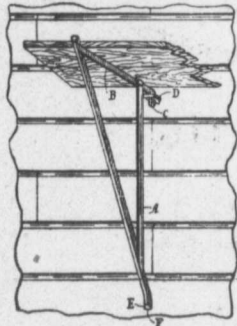
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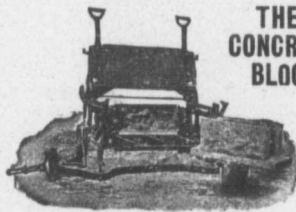
24 CHAPTERS

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# A FEW OPINIONS

On the  
Ransome Concrete Mixer

Read Some Unmistakable Evidence  
THAT THE RANSOME CONCRETE MIXER IS JUST AS EFFICIENT  
AS WE CLAIM IT TO BE

FROM: WILLARD KITCHEN CO., LIMITED  
CONTRACTORS  
Fredericton, N. B., October 15th, 1907.

GENTLEMEN:  
In reply to yours of 11th inst. requesting that we advise you how we like the Ransome Concrete Mixer, which we bought from you last spring, we beg to say that we have had every satisfaction and we have not anything but praise to offer for this Mixer, we found it all you said it was.

Yours very truly,  
WILLARD KITCHEN CO., LIMITED.

FROM: REXFORD-BISHOP, LIMITED  
CONTRACTORS  
Montreal, Que., October 12th, 1907.  
Re Concrete Mixer

DEAR SIR:  
We have pleasure in advising you that the Ransome Concrete Mixer, purchased from you early this summer has been working continuously without any expense for repairs and has given satisfaction in every respect.

Yours sincerely,  
THE REXFORD-BISHOP CO.,  
D. A. REXFORD, President.

FROM: ALFRED GARDNER & CO.  
CONCRETE FLOORING AND PAVING CONTRACTORS  
Toronto, O. tober 18th, 1907.

DEAR SIR:  
We have found the "Ransome" Concrete Mixer, we purchased of you early this season, to be in every way satisfactory and can highly recommend same to intending buyers.

Yours truly,  
A. GARDNER & CO.

FROM: DOMINION ENGINEERING & CONSTRUCTION Co., LIMITED  
ENGINEERS AND CONTRACTORS  
Montreal, November 6th, 1907.

GENTLEMEN:  
In reply to your enquiry of the 5th inst. we take pleasure in stating that we have had five Ransome Mixers of various sizes in use during the past two seasons at building work, and for the service to which we put them we found them all to be entirely satisfactory. They have fulfilled all the claims you made for them. Yours truly,

DOMINION ENGINEERING & CONSTRUCTION CO., LIMITED.  
WALTER J. FRANCIS, Assistant-Manager.

We have hundreds of satisfied users and would like you to look into the merits of the Ransome Mixer and you'll then be satisfied also that we have the best machine for concrete work on the market.



**F. H. Hopkins & Co**  
SUCCESSORS TO LATE JAS. COOPER  
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