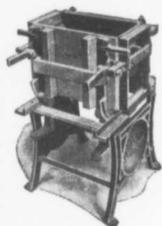


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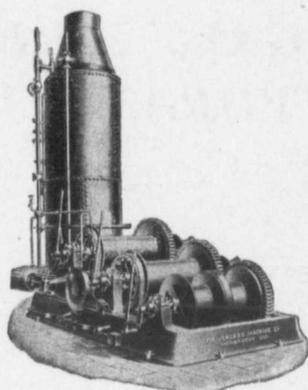
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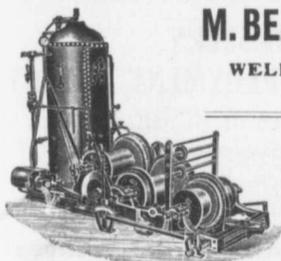
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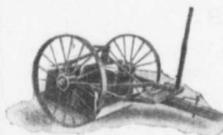
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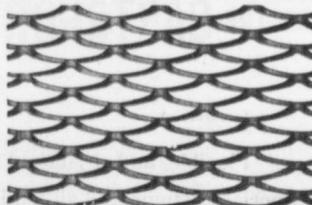
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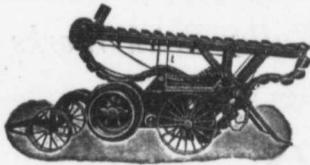
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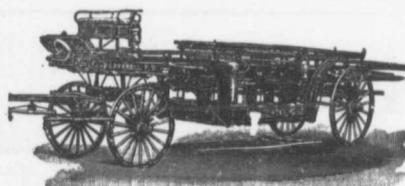
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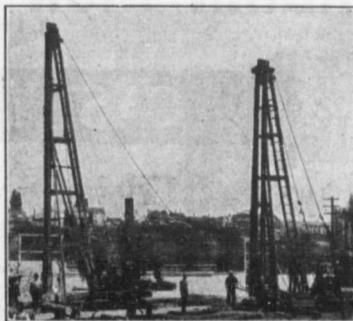
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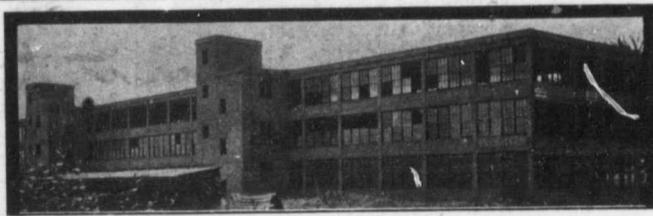
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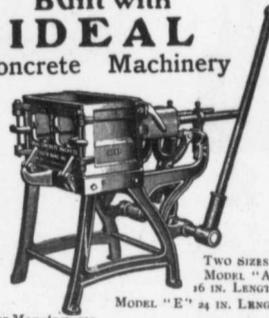
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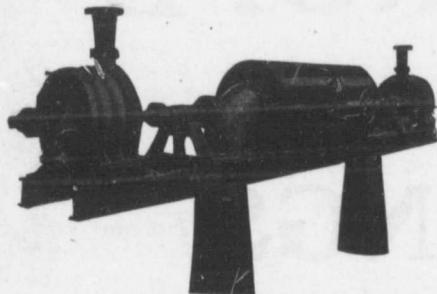
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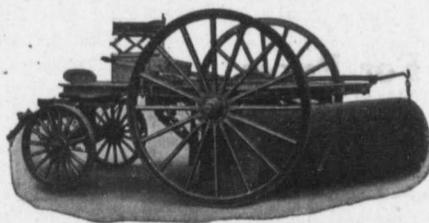
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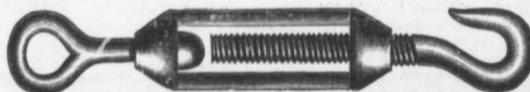
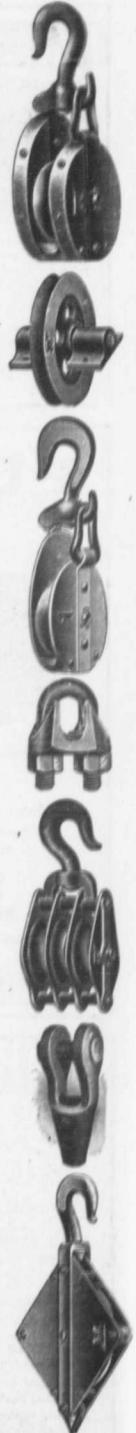
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CANADIAN CONTRACT RECORD

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Reasons for Optimism.

Once upon a time an Irishman fell off the roof of a twenty-storey building and rapidly headed downward. His native cheerfulness and hopefulness did not desert him, and as he passed each floor he was heard to shout "All right, so far!"

The Turn at Last.

A remarkable stimulus to retail business was noted by many Winnipeg merchants on Saturday. It is claimed that it was one of the heaviest days for a year, and one merchant stated that the indications pointed to very active trade for the remainder of the winter.—Free Press.

Already a Trade Revival.

At a council meeting of the Canadian Manufacturers' Association it was stated that the railways had ceased building cars and the Railway Committee was instructed to point out to the Railway Commission that the result would be a serious shortage in cars this fall, inasmuch as indications pointed to an early and brisk revival in trade. Edward Gurney predicts that 1909 will be the biggest year Canada has yet seen.

More Building Means Cheaper Money.

Throughout the entire country there was no reason for self-congratulation regarding the returns for new

building in January. Nevertheless the exhibit is not so bad as it might appear, and at the present moment there is much more work coming into view than is indicated by the current run of building permits. Many investors who shrank from putting money into real estate improvements by reason of the high prices of labor and materials prior to the recent period of depression are now investigating the situation with a view to presently embarking on their undertakings. A constantly increasing amount of estimating and figuring is being done and from all accounts a very considerable amount of work is going to be in hand with the coming of spring. Particularly in the West is the opening up of building activity noticeable. In Calgary at the present time there is work under construction to the value of over \$900,000. Prince Albert and Vancouver are almost equally notable examples, and all over the Dominion there is an awakening interest in structural undertakings that bodes well for the future.

Money must become cheaper, however, and until it can be had for real estate investments at 6 per cent. and under there is reason to expect that speculative building will be detrimentally affected. That rate will be reached before many months, in all likelihood, and perhaps even sooner than is generally expected.

The Use of Concrete and Cement Blocks

As a market for cement products the farm is well worth the serious consideration of any cement man who is located in an agricultural district. Operations in any one instance may not be on a very grand scale, but if you are looking for a class of good, steady customers, cultivate an acquaintance with the farmer. The farm journals and agricultural schools are accomplishing great things in the improvement of farming conditions and the average farmer is already, in fact, an eager student. And anyone who goes out to talk to the farmers on subjects that relate to the farm, need not hesitate to use technical terms if he understands them, for he will find

that farming is fast being reduced to a scientific basis and most of the farmers are, to say the least, pretty well grounded in the rudiments of this science.

Another characteristic of the farmer which makes him a good customer for the cement man to wait upon is this: It is the ambition of all farmers to see the farm stay in the family. The father wants to see the land pass on to the son. And so he does not hesitate to make permanent improvements. He like to feel that the things for which he is now struggling and sacrificing the best that is in him, will be a source of profit or comfort to his children and his children's children.

The uses to which concrete may be put on the farm are as unlimited in their scope as in any other industry.

Civic Economy.

The Master Carpenters' Section of the Builders' Exchange who, it was mentioned in our issue of last week, have been interviewing the Board of Control with regard to giving out by day labor work which might, with a considerable economy, be let by tender, have succeeded in impressing the authorities with the validity of their claims. Mr. Arthur Dinnis stated that they were certain the city could not, for example, build the new ferry shed by day labor as cheaply as by tender, and claimed that the master carpenters would be perfectly satisfied to have the City Architect tender on any contract in a similar manner to that in vogue in the Engineer's department.

Moreover, if the contract was awarded to the City Architect, a competent man should be employed to see that the work was done according to the plans and specifications and, further, to keep a strict account of the cost of material, labor, and other incidentals, so that the citizens might be aware of the correct cost when the work was finished.

The Property Commissioner stated that he recommended the work to be done by day labor, because he could not get contractors to do the work in time for the opening of navigation. Mr. Dinnis repudiated this, and stated

that he would guarantee to build a "box" like the ferry shed in thirty days. The Mayor said that the principle advocated by the contractors was in his opinion correct, and that in future all such work would be advertised for tender.

This is an important decision for the contractors of this city, as there is no doubt, as pointed out by Mr. Dinnis, that if in these precarious times the working men need work, the business men also need business. It is a good thing also to nip in the bud the desire of civic officials to have the spending of civic money in their own hands, while not giving all classes of citizens an equal chance to make a living in the city in which they pay taxes.

Percentage Basis in Millwork and Contracting.

We continue to hear quite a lot about what is called the percentage basis in planing mill work and contracting work generally, and along with the reports of work being done this way there is occasionally a word to the effect that it is the coming thing, and that the chances are decidedly in favor of much of the building work of the future being done on what is termed the percentage basis. What we would like to know and to have specific information on is, what people generally regard as a fair percentage, says the "Woodworker." The general plan, as we understand it, is for the contractor or planing mill to figure on doing any given job of building, using the best practical efforts to keep the cost down to a reasonable basis, then charge in addition to the actual cost of the material and work a certain percentage as profit for the contractor of planing mill. It will be recalled that some such basis of figuring as this entered into the proposition that was up some time ago to have the Panama Canal dug by contract.

Evidently the magnitude of the job should have something to do with the percentage charged. We would like

to get straightened out on the things if this method is to become popular and general. To figure work on a percentage basis presents certain advantages, and probably, on the other hand, an equal number of disadvantages. In case of fire or some occasion where it becomes decidedly important to have estimates for rebuilding immediately, the percentage basis readily furnishes a short cut to letting the contract and getting the work started. All the contractor needs do is to get a rough estimate of the probable cost, then make agreements as to the percentage he is to be paid above the actual cost, after which he can get busy and frequently have the work pretty well under way by the time it would take him and other contractors to get at their competitive bids through figuring all items in detail. On the other hand, of course, it puts the man who gets the work done into position where he gets to know exactly what the planing mill will make in the form of profits, and practically eliminates the chance for big profits on the job.

There is, of course, some recompense in that while curtailing the chance for big profits, this percentage basis practically eliminates the chance for loss. In other words, it puts the planing mill work and contracting on what might be termed a more positive basis, like loaning money out at a certain per cent; you know beforehand what your returns will be, and at the same time you know that you cannot make what might be termed excessive profits. However, what we are after at the present time is not so much a pro and con discussion of the possible merits of the percentage basis system, as to seek information on just what percentage is considered about right on jobs of a given size, and other essential details, to make clear the idea of doing planing mill and contracting work on the percentage basis.

**A PESSIMIST
is a man who turns out
the light to see how dark
it is.**

Canada's Trade for 1907.

During the twelve months of 1907 Canada's total trade amounted to \$635,840,681, an increase of \$45,895,877, as compared with 1906.

The total imports were \$362,515,267, an increase of \$42,048,067, or about 12 per cent.

The total exports were \$273,325,414, an increase of \$3,847,810, or less than 2 per cent.

Of the total increase in imports, \$17,448,914 was in imports from Great Britain, \$19,121,983 from the United States, \$1,281,508 from France, and \$984,886 from Germany.

On the other hand, our exports to Great Britain decreased \$8,713,849; exports to the United States increased \$10,149,547; exports to France decreased \$43,920, and exports to Germany increased \$375,556.

Canada's total imports during the year from Great Britain were \$95,094,488, and the exports to Great Britain were \$126,347,931; imports from the United States were \$215,245,100, and exports \$117,536,998; imports from France were \$9,501,052, and exports \$1,872,424; imports from Germany were \$8,049,884, and exports \$1,872,659.

Engineers Fraternalize.

After a luncheon at the St. Charles, at which some twenty-five members and their friends were present, the Toronto Section of the American Institute of Electrical Engineers hold their regular February meeting at the rooms of the Engineers' Club, 96 King street west, last Thursday evening. This was a joint-meeting, many members of the club also being in attendance.

After the formal business of the evening, the chief item of which was the presentation and carrying of a motion requesting the Board of Directors to take up the matter of the subdivision of the Associate group of the membership, the technical subject of the evening was taken up. This involved a paper presented by Mr. Walter T. Moody, of the Schenectady Section, who very thoroughly treated the subject in hand, namely, "Feeder Regulators."

Structural Engineering.*

In designing any structure it should first be considered as a whole and afterwards in detail. This may seem to be an unnecessary admonition and one that would always be followed as a matter of course. Unfortunately this is not so, and too great a consideration of detail is sometimes allowed to mar the excellence of the whole. A design should be looked upon from an economic standpoint, as a sound piece of engineering construction and from the aesthetic point of view also: These considerations have been placed in the order in which unfortunately they are of necessity considered. This being an utilitarian age, the question of cost not only enters largely into, but frequently governs the design, the cheapest design being usually followed, provided that it fulfills the essential engineering conditions. The design is a good specimen of the engineer's handiwork, usually comes second into considerations and sometimes good patterns must be sacrificed to the first great consideration — economy. The aesthetic standpoint is unfortunately the last and quite frequently does not seem to have been one from which the designer has considered his work at all, in fact it may be said that, usually only on very large structures does it enter into the design to any appreciable extent. When it is considered that almost all structures built are required to fulfil certain conditions at the minimum cost, it is not to be wondered at that general designs, outlines and details are largely fixed by the dictates of dollars and cents. The number and length of spans in a crossing are usually fixed by the minimum cost, the main dimensions of a truss are determined largely by the maximum weight, and the details are designed and often standardized so as to render necessary the least labor possible in construction. The conscientious engineer will always endeavor to make his design conform as closely to the best engineering practices as the conditions under which he is working will permit. The aesthetic side of designing also should

not be lost sight of, the appearance of a bridge may sometimes be greatly improved by a slight alterations of outline, shape of gusset plates, design, especially in deck bridges, but this artistic standpoint of designing must be carried out in harmony with the general engineering design; cheap ornamentation tacked on to a good design with which it does not harmonize is rather an eyesore than an ornament. An arch harmoniously designed is probably the most pleasing structure that can be erected, although some of our suspension bridges are certainly works of art as well as monuments of engineering. The curved top chord of a truss almost always adds as much to the beauty as to the economy of a bridge. The material of which a structure is built has a great effect on its appearance. The general design should harmonize whenever possible with the surroundings. The relation of height and width of piers should be considered together with the length of the supported spans. Long heavy spans harmonize with heavy broad stone piers, while narrow steel towers and bents go better with short spans. A vertical longitudinal curve in a bridge produces a pleasing effect, and should be provided on all those of any great length. A structure may have very little ornamentation and yet be very pleasing to the eye on account of its inherent beauty and apparent suitability to the purpose for which it has been designed.

In a bridge the general design should be as nearly symmetrical about the centre as conditions will allow, the general outline should please the eye. Clearness of purpose should dominate the design, "eternal fitness of things" should be evident, that is, the various members of a structure should indicate from their appearance the function they perform towards the whole, they should show fitness for their work, a compression member should appear as massive as possible and a tension member with equal stress should have a much lighter appearance, those of greatest stress should appear so, for example, the diagonals of a truss should diminish in side elevation from the end towards the centre of the

truss. The design should be such as to provide the shortest path for the stresses to pass to the supports, also to equalize the stresses in similar members so far as possible. The details should be so designed as to reduce the shop labor as much as possible, and so as to be of greater strength than the main members.

The highest quality to strive for in a design is simplicity, from the purchaser's standpoint the simplest design is the best; from the manufacturer's standpoint it is the cheapest. The structure should be simple, so that the path of stress is known and so that its amount may be accurately calculated, the joints as few in number as possible and detailed so as to be cheaply and easily constructed, both in shop and field. The action of the various members of the general design should be assured, so that one member will not be called upon to do the work of another which it was never intended to do. There should be no ambiguity as to the path of stress through the various details. The exercise of good judgment enters largely into successful designing; although the stress produced by the specified exterior loads may generally be accurately calculated, it is quite often necessary to proportion members and details much larger and stronger than the specification calls for, as in the case of laterals for railroad bridges, which quite often are more necessary to take up vibration than to withstand the specified wind loads; stiffness also demands larger sections in members sometimes than the stresses would indicate. The working lines of stress in a member should coincide with the centre of gravity of the section of the member, and all such lines of members coming together at a point should intersect in one point as far as practicable. Members of a truss, etc., should be symmetrical as far as possible about two planes, one lying in the plane of the truss and the other at right angles to it. In designing, the work of the erector should not be lost sight of, joints should be so made as to cause a minimum amount of field riveting, the rivets should be so placed as to be easily driven, the joints should be

* Paper read by E. A. Stone before the Nova Scotia Society of Engineers.

designed so as to come together easily, ample clearance should be provided in all cases, and it should be remembered that the finished product of a bridge shop is not "machined all over" by any means. All parts must be accessible after erection for painting, for the life of the construction is largely dependent upon the keeping up of a good covering of paint.

Before starting a general design all the data involved should be at hand to avoid annoying changes after the work has been advanced. In determining the location of supports, skewers should be avoided as much as possible. The ideal crossing has square ends, is located on a tangent and level grade and this ideal should be worked up to as often as circumstances permit, the locating of bridges on complicated spirals is an abomination. A correct profile of the crossing is necessary, showing height from base of rail or roadway to highwater level so as to determine necessary heights, clearances and whether span shall be through or deck. The most economical number of spans for a crossing is fixed by the criterion that the cost of the pier must be equal to the cost of the main trusses and bracing of one of the spans.

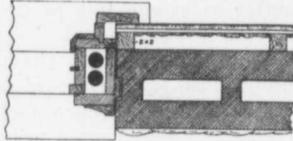
Generally speaking, deck bridges are more economical than through, as the trusses may be placed closer together, making a large saving in the floor system—getting at the same time a more effective and economical bracing. The economy in the substruction is, also, quite an item to be taken into consideration. It is a good point in designing deck spans to carry the masonry to the top chord, and thereby obtaining greater stability and rigidity.

A Method of Making Window Frames.

A method of making window frames for an eight inch thick concrete block wall, furred with 2 by 2 inch strips and lathed and plastered, is given in the "American Carpenter and Builder":

About all that can be done in a case of this kind is to make the window boxing come within the clear of the opening between the jambs, as

shown in the accompanying sectional drawing. A special wide mould is used on the face of the frame to relieve the plain surface that otherwise would show. This mould should carry across the top so as to show the same width as at the sides, and when properly made to work with the blocks will look all right. Care should be



taken to have tight jambs, and, as most blocks are made with a slot at the ends, this can be successfully done by nailing a strip on the back of the frame so as to come within the slot and then filling in the remaining space with mortar. This not only breaks the continuous crack, but also makes an excellent tie in the wall.

Cleansing Smoke Stains from Brick Fronts.

It very often happens that the brickwork of a building is stained with smoke from fire, and the question naturally arises as to the best method of cleansing the brick so that it will appear as much as possible like the original. A question of this character came up recently in the "Painters' Magazine," in reply to which the following method was suggested:

To 1 gallon of good soft soap, not too watery, add 2 pounds of powdered pumice, 00 or F., and 1 pint of liquid ammonia. The article sold as household ammonia will answer, though it will be all the more effective if a little stronger. First remove as much of the soot and dust as possible with a stiff broom or fibre brush, then apply the soap and ammonia mixture with an ordinary fibre wall brush or common whitewash dip, let it remain for about 20 to 30 minutes, then with a good scrubbing brush rub it briskly, dipping the brush into clear water once in a while. Have a few pails of water handy and a large carriage sponge to go over the scrubbed surface and finally rinse with clear water. If convenient, use a hose with spray nozzle for rinsing. This will

remove the most stubborn case of staining from fire and smoke.

Quebec Bridge Pier in Danger.

It is reported from Quebec that there is danger of the destruction of the main pier of the wrecked bridge by ice jams in the coming spring. The danger lies in the fact that the fallen superstructure of the defunct bridge still remains in the same position as at the time of its collapse, and the steel linked with the main pier, should be cut asunder to obviate the danger. The water in the river channel where the superstructure fell is not less than 300 feet deep, and consequently the steel work cannot be recovered, especially on account of its great weight.

Engineers cognizant of the situation say that there is no other alternative than to cut the steel connected with the main pier and cause it to sink to the bottom of the deep river, where it will be no impediment to navigation. They likewise assert that the metal should be cut as soon as possible, to avert injury to the main pier on the south side of the river before the ice shove in the spring.

Death of Mr. George Moir.

By the death of Mr. George Moir, which, after an illness of five weeks, occurred last Wednesday at his home in this city, Toronto has lost one of its best-known contractors. Mr. Moir, who was in his sixty-fourth year, built several prominent city structures, among them being McMaster University, Broadway Tabernacle, St. Paul's Anglican Church, Bloor Street Presbyterian and the Toronto Club building. The deceased was born in Scotland, but has been a resident of Toronto since 1870. He was active in Masonic circles and was a member of Erskine Presbyterian Church. He is survived by a widow, two sons and two daughters.

Messrs. Sanderson & Porter, consulting engineers, 52 William street, New York, announce that Mr. Wynn Meredith has been admitted as a member of the firm, and will take charge of their Western office, Union Trust Building, San Francisco.

Proportions for Concrete and Methods of Mixing.*

There is little difference obtained in results of broken stone or gravel. By actual test the writer has found that a broken stone having a rough surface with angular fractures will give an increase in strength over a rough bank gravel of about 15 per cent. in most cases. In some, however, the gravel has given the greatest strength. If the stone has a glossy surface such as is found with some trap rocks the gravel will always give the greatest strength. In the first instance, if the specifications required 1:3:6 broken stone concrete and there is a difference in cost between broken stone and gravel screenings of 2 cents per cubic foot it will be cheaper to use a mixture of 1:2½:5 with gravel and still obtain an equal strength with the broken stone. The writer makes the rule never to allow the size of stone in its greatest dimension to be more than half the thickness of the work into which the concrete is to be placed. In large size work, very much larger stone can be used than is ordinarily done with very good results, the only limitation being that of convenience in handling. In regard to placing, it is much easier to obtain dense concrete, that is, without voids, using gravel than using broken stone, as angular pieces will sometimes arch together, allowing a void to form underneath. Therefore, for water-tight work gravel is to be preferred every time. For nearly all classes of work the best results will be obtained by using such an amount of water that the concrete when placed will just hardly quake, but is not sufficiently soft to flow.

The leanest mixture the writer ever uses is 1:4:8. In heavy bridge abutments where mass rather than great strength is wanted, with thorough mixing and careful placing still leaner mixtures might be used with safety. By calculation it has been found that only one cent per cubic foot will be saved by using a mixture of 1:5:10, and the owner ought to pay this difference as insurance against

the carelessness which is apt to occur on this class of work. In building construction where no restrictions exist the writer's standard mixture is 1:3:6 for every part of structure. In 14 years of practice this has had some severe tests without failure. In one floor built 11 years ago and which has been frequently overloaded ever since, there has been a number of minor failures because the foreman, contrary to orders, mixed one floor 1:3½:7. This would appear then to be the limit of leanness. Mixtures of 1:2½:5 and 1:2:4 are often used, but are unnecessary in ordinary cases. Where a floor or column will be loaded in two to three weeks or is subject to vibration the richer mixture is desirable. A mixture richer than 1:2:4 is never necessary except in heavily loaded columns whose size is limited. Cement is the cheapest and easiest form of reinforcement. The writer has used in columns one part of cement to one part of graded stone without any sand for a working load of 1,200 pounds per square inch. When this is done care must be used to continue this mixture through the thickness of floor, which will have a leaner mix.

Mixers are of two general types, the continuous and the batch. The continuous can be divided into those with and those without power. Without power the principal machines are the Portable Gravity and the Haynes mixer, which is a series of conical hoppers supported one above another. The principle of both of these is identical; a concave inclined surface with pins inclined relatively to this surface of the machine. Those with power are of the trough type and have various means for mixing, such as screw, paddle blades or revolving trough or drum with blades attached to side. The difficulty of good work with all this class of mixers is in combining materials before feeding into the machine. If they are not properly combined in the right proportions before feeding it cannot be done afterwards. There are various types of automatic feed to overcome this trouble, but they are not all positive and require constant attention.⁴² This type of machine is not much used now, due chiefly to this uncertainty and in part be-

cause they are not as economical to operate as a good batch mixer.

Batch mixers are almost universally used because their mixing is positive. They can be obtained in the form of cubes, cylinders and double cones. All give good results because all material in each charge is thoroughly mixed together, the difference in operation of the various machines being in the case of discharging and the wear and tear of the machine parts. The writer has used the Chicago cube, the Ransome and McKelvey cylindrical and the Smith double cone machines, and prefers the latter to any other because of its very quick and clean discharge and because the wear and tear is small. With the batch mixer it is entirely unnecessary to dry mix before wet water remaining from one batch will interfere with the dry mixing of the next. The best method to follow when the whole batch is not dumped into the machine at once from a measure is to add water first, then stone; these scour out the mixer so that it always runs clean, then, cement and sand last.

The question is sometimes asked when to use a mixer. The answer is when the cost of setting up, taking down and transportation equals the difference in cost of mixing by hand or machine. It has been the writer's experience that under ordinary conditions concrete can be measured and mixed by hand for \$1.30 per cubic yard and by machine for \$0.85 per cubic yard for the simplest method of setting up. The difference between these, \$0.45, times the number of yards to be mixed, will give the saving to be used in paying the general expenses of setting up a mixer, which for teaming a distance of three or four miles, setting up, dismantling and returning, together with allowance for wear and tear amounts to \$70. The cost of operating is included in the above cost of mixing. It will thus be seen that a job using 155 cubic yards will be as cheap machine-mixed as by hand, and of course any larger job should invariably be mixed by machine. The size to use should be determined by the size of the job and the amount which must be placed

Continued on page 20.

*Adapted from a paper read at the Buffalo Convention National Association of Cement Users, January, 1907 by L. C. Watson

Contracts Department

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

CONTRACTS OPEN.

Barrie, Ont.

J. Broadway has taken out a permit for the erection of a carriage factory in this town to cost \$4,000.

Belleville, Ont.

Tenders are invited by Rev. D. A. Twomey up to March 9th for the erection of a school building for St. Michael's parish. Plans and specifications may be seen on and after March 2nd at residence of Rev. D. A. Twomey this city, and at office of Colborne P. Meredith, Ottawa.

Brandon, Man.

The time for receiving tenders on the proposed bridge over the Assiniboine river has been extended to March 14th.

Brantford, Ont.

The Bank of Nova Scotia have commenced the alterations to the Colborne street store, which they will remodel at a cost of from \$6,000 to \$7,000.

Brockville, Ont.

It is stated that plans have been prepared for a new wing to the Collegiate Institute and that work will commence in the spring.

Chilliwack, B. C.

The newly formed International Power Company, of which S. A. Cawley is secretary and treasurer, are seeking water rights on the Chilliwack river. According to the particulars furnished to Mr. Fisher, government agent, there is a drop of about 400 feet between the point of diversion and the place of returning, and the water will be harnessed by means of dams, ditches, pipes and flumes.

Chute a Blondeau, Ont.

Fred Gelinis, Secretary, Department of Public Works, Ottawa, wants tenders up to March 18th for the construction of a landing pier at this place according to plan and specification to be seen at office of J. L. Michaud, Resident Engineer, Montreal, on application to the local postmaster and at the Department.

Coverdale, N. B.

C. H. LaBillois, Chief Commissioner, Department of Public Works, Fredericton, wants tenders up to March 23rd for the construction of the Mill

Creek Mouth bridge. Tenders were taken for this work last fall, but it was found necessary to secure fresh bids.

Clarendon, N. B.

C. H. LaBillois, Chief Commissioner, Department of Public Works, Fredericton, will receive tenders up to March 9th for rebuilding the Bryson bridge, according to plan and specifications to be seen at the Department, at the residence of Nathaniel Floyd, Clarendon, and at the office of H. V. Dewar, St. George, N. B.

Deseronto, Ont.

A gas producer plant is to be installed at the pumping station and a special committee have been appointed to secure figures on the cost. A 100-horse power engine will be required.

Dunnville, Ont.

The Dunnville, Wellandport & Beamsville Railroad will shortly submit a proposition to the municipalities through which their line is to run and it is understood that construction will start this summer. The provisional directors are: James A. Ross, president; F. R. Lalor, M. P., vice-president; W. J. Aikens, secretary; Mayor Smith, Thomas Marshall, B. L. Edgecombe, M. L. Parry, F. J. Ramsey and E. E. Anderson.

Estevan, Sask.

The C.P.R. are reported to be contemplating considerable expenditure at this town in the erection of a \$20,000 depot and other extensions. F. S. Darling, of Toronto, engineer of construction.

Guelph, Ont.

Upon the condition that the city furnish the site and \$10,000 cash, assurance is given by Hon. Nelson Monteith, Minister of Agriculture, that an additional winter fair building will be constructed this summer on the site below the Grand Trunk tracks.

Glenelg, N. B.

Tenders are invited by C. H. LaBillois, Chief Commissioner, Department of Public Works, Fredericton, up to March 9th for rebuilding the Fraser bridge at this place. Specifications may be obtained at the Department and at office of Robert Murray, M.P.P., Chatham, N. B.

Halleybury, Ont.

J. I. Rankin, secretary of the school board, wants tenders up to March 6th for the erection of a new public school, according to plans at office of A. D. Pillar, architect.

Hamilton, Ont.

The congregation of Herkimer street church are considering a proposition to erect a \$20,000 building and are holding a special meeting this week to discuss plans.

Hartland, N. B.

Keith J. Plummer, Horace R. Nixon and Franklin Clark are planning the erection of a 3-storey business block to be erected this season at a cost of \$50,000.

Hintonburg, Ont.

Plans are being prepared by City Engineer Ker, of Ottawa, for a new sewerage system in this town. Preliminary tests have already been made and it is probable that the work, which is to be carried out under the local improvement plan, will be started next month.

Kamloops, B. C.

At a recent meeting of the Anti-Tuberculosis Society announcement was made to the effect that a hospital for advanced cases was to be established somewhere between this town and Vancouver and that plans for the undertaking were already well advanced.

Keewatin, Ont.

Preparations are being made for the erection of a second C. P. R. bridge over the west branch of the Winnipeg river.

London, Ont.

A new Catholic clubhouse to be known as the "Parish Hall," is to be erected by St. Peter's Cathedral on property at the corner of Kent and Richmond streets.

The Exhibition directors will carry out a program of improvements to the fair buildings this season. Tenders for painting will be called for very shortly and the necessary additions will be put in hand later on.

John M. Moore, Engineer and Superintendent of the London Waterworks, will receive tenders up to March 3rd for the following supplies for 1908:

Cast iron pipe, lead pipe, hydrants, valves, valve fittings, special castings, hardware, lumber, etc. Specifications may be seen at the office of Moore & Henry, Albion building.

The council have ratified the recommendations of the special hospital committee that the city join with the county in asking for special legislation to enable the acceptance of Mr. Blair's gift and that confirmation be given to the bylaw passed by the county setting aside \$4,000 for the purpose of erecting and equipping the hospital for consumptives.

J. M. McEvoy recently sent a communication to the city council on behalf of a company who intend building an abattoir shortly and it is understood that plans will be submitted before long for a modern and up-to-date plant. It is rumored that there are two companies who will establish abattoirs near the city, provided the authorities do not bind themselves to one concern.

Matsqui, B. C.

D. R. Ker, T. W. Paterson and C. A. McDonald, all of Victoria, are among those interested in a project to establish a model dairy in this locality. A site has already been purchased and the construction of the necessary buildings is to start at once.

Montreal, Que.

Tenders for a new grand stand on the Montreal base ball grounds will be called immediately.

The water department are understood to be considering plans for the enlargement of the aqueduct at an estimated cost of \$2,000,000.

The Post Office Department have secured from the G.T.R. a site on St. James street where they will erect a new building for handling railway mail.

The Fire and Light committee are asking the Finance committee for an appropriation of \$63,438 for the purchase of a new fire alarm equipment for installation at the Berthelet street fire station.

J. A. Christian, of the Montagnard A. A. A., has obtained permission to erect an ornamental amusement building on property just east of Atwater avenue on St. Catharine street.

It is generally understood that the sale of the Alliance Insurance Building, which is assessed at \$300,000, is about consummated. The new owners are reported to have the intention of pulling down the building and erecting another on a more pretentious scale.

New Lunnon, Alta.

Alex. Lewis, Secretary-Treasurer, wants tenders up to March 15th for the erection of a schoolhouse. Plans may

be seen at post office and at office of the "Bulletin."

Ottawa, Ont.

Darling & Pearson, architects, Toronto, want tenders up to March 4th for all trades in the erection of a club house for the Ottawa Country Club. Plans at architects' offices.

Tenders are invited by L. K. Jones, Secretary, Department of Railways and Canals, up to March 20th for the supply and delivery of British Columbia or Douglas fir timber required for the Rideau canal. Specifications can be obtained at office of Superintending Engineer of the Rideau canal, Canadian Building, this city.

J. B. McRae, C. E., and William Kennedy, C. E., have been in consultation in reference to the plans for the new Chaudiere dam, the construction of which, this season, was decided upon at a recent meeting of the Ontario and Quebec owners. The new structure will be of steel and concrete construction and will cost in the neighborhood of \$150,000.

Owen Sound, Ont.

It is stated that two new factories are to be established here this season and that operations will commence early in the summer.

Perth, Ont.

This town will seek authorization next session for the issue of debentures to the amount of \$8,491.99 in connection with drainage and sewerage works.

Phoenix, B. C.

A large underground construction scheme is mooted. It is proposed to build a tunnel from this town to Greenwood, rather more than three miles, at a cost of \$3,000,000. Chicago capitalists are reported to be interested in the project.

Port Arthur, Ont.

Engineer Mond's has completed the survey for the proposed power development at Dog Lake Falls, undertaken at the instruction of Cecil B. Smith, Toronto. The transmission line will be nearly twenty-five miles long.

Quebec, Que.

Hon. Rudolphe Lemieux, Postmaster General, was recently in the city and stated that a site had definitely been selected for the new St. Roch post office at the corner of Dorchester and St. Joseph streets and that a large and commodious building would be erected thereon.

Strathcona, Alta.

The city council are considering a bylaw to raise \$17,500 for the part cost

of constructing a high level traffic roadway upon the proposed structure over the Saskatchewan river.

Swift Current, Sask.

Hutchinson & McGlashen, architects, of Regina, have prepared plans for the construction of a new Masonic temple to be erected here at a cost of \$13,000 and it is expected that tenders will shortly be called for. The same firm are also preparing plans for two new stores and a residence.

Toronto, Ont.

Darling & Pearson, architects, are taking tenders up to March 4th for the erection of a club house for the Ottawa Country Club.

The Knox college building committee, A. K. Macdonald, chairman, are about to take plans for the proposed new \$400,000 building.

Owing to the noise of shunting at Cottingham street school the property committee have asked a grant of \$55,000 for a new building.

A recommendation for the purchase of a new steam fire engine for the north-western part of the city has been submitted by the Fire Committee.

Chadwick & Beckett, architects, want tenders from all trades up to March 5th for the erection of an addition to the Canadian Military Institute on University avenue.

At a recent meeting of the special power committee a recommendation was passed calling for the appointment of an engineer to make an estimate on the cost of installing a plant.

Application will be made by North Toronto at the next session of the legislature for authority to issue debentures to the amount of \$38,949 for the construction of water mains and other local improvement works.

J. O. Reaume, Minister of Public Works, will receive tenders up to March 4th for the construction of timber bridges over the White river at Englehart and Hilliardton in the district of Temiskaming. Plans and specifications may be seen at the Department, or at the office of W. E. Kerr, Inspector of Colonization Roads, New Liskeard.

Recent building permits include:—John Polesky, pair 2-storey semi-detached brick store and dwellings, Queen street East, \$6,000; S. M. Parker, 2-storey and attic brick dwelling, Cowan avenue, \$3,500; N. H. Grady, 2-storey brick dwellings, Galley avenue, \$6,000; T. B. Greening, 2-storey and attic brick dwelling, George street, \$25,000; E. Davis, 2-storey brick dwelling, Kendal avenue, \$3,000; Dr. Frankish, 2-storey brick dwelling, corner Bloor street and Brunswick

avenue, \$5,000; L. A. Weismillen, 3 attached 2-storey brick dwellings, Fern avenue, \$7,500; Smith & Taylor, 1-storey brick residence, Bay street, \$9,000; J. L. Lacton, 2½-storey brick dwelling, Geoffry street, \$3,000; B. H. Moorehouse, pair 2-storey semi-detached dwellings, First avenue, \$3,600; J. H. Bertram, 2½-storey brick dwelling, Chestnut Park road, \$6,000; Hamilton Milligan, 2½-storey brick dwelling, Dundas street, \$3,000; W. Colwell, pair 2-storey semi-detached brick dwellings, Concord avenue, \$5,400.

Tweed, Ont.

E. J. Cowan, of the Frontenac Mining & Smelting Company, is in Pittsburg endeavoring to arrange for the location of a smelting plant in this town.

Vancouver, B.C.

C. O. Wickenden, architect, this city, has prepared plans for an extension to the bank of British North America to be put in hand early this season.

According to the statement of C. H. Wilkenson, President of the British Columbia Development Company, no less than \$250,000 will be spent by the company this year upon the irrigation of the Kootenay district.

The North Vancouver hospital board have approved plans for a new hospital building. The structure will cost in the neighborhood of \$10,000 and will be enlarged when necessary. Construction will be undertaken at the earliest possible date.

G. Starratt, Director of the Canadian Fish & Cold Storage Company, is authority for the statement that Geo. L. Clayton, of Seattle, Wash., is now preparing plans for the mammoth plant to be erected here. The contracts will probably be let in May. Estimated cost \$250,000.

Tenders will be received at the office of the City Clerk up to March 2 for the construction of the sub-structures of the new bridges over False Creek, at Westminster avenue and Granville street; also for the wooden trestle approaches to the Granville street structure and the embankment approaches to the Westminster avenue structure, and for the construction of a temporary bridge over False Creek at Westminster avenue.

Victoria, B.C.

A. L. Adams is preparing plans for the extension of the waterworks.

Waterloo, Ont.

Nathan Clemmer has just taken tenders for the erection of a brick school house in Waterloo township.

Winnipeg, Man.

Attention has been directed to the overcrowding of the Collegiate Institute and it is likely that the matter of an enlargement to the present building or the erection of another institute will be considered by the school board at an early date.

The Provincial Government have made a grant towards the erection of a proposed railway and traffic bridge over the Red river, for which plans have already been prepared, and negotiations are now in progress between the Board of Control and the National Transcontinental Railway Commission.

The Western College board have raised \$44,000 of the \$50,000 required to secure a large donation from the Massey estate towards the erection of a new building.

A deputation from Elmwood, headed by Alderman Midwinter and J. A. Potter, waited on the board of control recently with a request that a new and wider super-structure be put on Louise bridge in order to allow of the operation of street cars and provide facilities for the increased traffic from across the river. City Engineer Ruttan has been instructed to ascertain the cost of the proposed work. The city engineer has also been instructed to prepare estimates of a new structure over the Red river at Higgins avenue.

Woodstock, Ont.

The property committee have been instructed to secure plans for a new eight-roomed building to replace the present Delatre street school in the west end of the city.

CONTRACTS AWARDED.

Hamilton, Ont.

Engineer Sothman has recommended for acceptance the following tenders for electric pumps; Buffalo Pump Company, \$7,600, James McDougall Company, \$7,720 and the Canadian General Electric Company, \$9,100.

Katevale, Que.

Verret & DeSauris, of Sherbrooke, have secured the contract to erect an edifice here for the Roman Catholic church at \$20,650.

Montreal, Que.

The C. P. R. have awarded a contract for 30,000 tons of steel rails to the Dominion Iron & Steel Company.

New Westminster, B. C.

E. G. Prior & Company, Limited, of Vancouver, have been awarded the contract for the metal required for the super-structure of the new swing bridge over the North arm of the Fraser river. The contract price is at the rate of \$8.80 per 100 pounds.

Peterborough, Ont.

Rogers, Denman & Company, of this city, have obtained the contract for the second section of the Trent canal.

St. Catharines, Ont.

W. P. Nott & Company, who obtained the contract for the first section of the Trent canal, have notified the Department of Railways and Canals that they are unable to proceed with the work and the contract has accordingly been awarded to the next lowest tenderers, Larkin & Sangster, of this city.

Toronto, Ont.

The Randolph MacDonald Company, of this city, have secured the contract for the Rosedale section of the Trent canal. By a typographical error this contract was inadvertently coupled in our last issue with a leading firm of local architects, Messrs. Simpson & Young.

Vancouver, B. C.

The Vancouver Construction Company have the contract for a 3-storey business block to be erected on Westminster avenue at a cost of \$25,000.

Victoria, B. C.

Messrs. Barr & Anderson, of Vancouver, have secured the contract for putting in a system of hot water heating and renewing the plumbing in St. Joseph's hospital, this city, at an approximate cost of \$20,000.

New Companies.

Schram Automatic Sealer Company, Limited, Toronto, Ont., incorporated, capital, \$100,000. Incorporators, James Arnold, E. J. Wills, C. M. Kirby, L. E. Hambly and W. J. Robertson, all of Toronto.

Queen City Construction Company, Limited, Toronto, Ont., incorporated, capital \$50,000. Incorporators, C. B. Jackson, of Petrolia, Ont., and J. E. Denise, J. P. Holden, J. A. Jackson, W. E. Denise and E. Lake, all of Toronto.

Berg Brick Machinery Company, Limited, Toronto, Ont., incorporated, capital \$250,000. Incorporators, Anton Berg, S. Berg, C. A. Ross, J. A. Thompson and others, all of Toronto.

Watson Carriage Company, Limited, Ottawa, Ont., incorporated, capital \$40,000. Incorporators, R. E. Watson, J. T. Moxley, R. G. Code, E. F. Burritt and A. G. Acres, all of Ottawa.

La Compagnie de la Turbine Simplex Gallinard, Limited, Montreal, Que., incorporated to exploit and manufacture the patent known as the simplex turbine, capital \$250,000. Incorporators, Paul Gallinard, J. Monier, E. Leclerc, A. St. Denis and others, all of Montreal.

Canadian Crocker-Wheeler Company, Limited, Montreal, Que., incorporated as manufacturers and dealers in metals and supplies, and to carry on a foundry and bridge building business, capital \$150,000. Incorporators, R. A. Stinson and S. J. Bell, of Westmount, Que., H. Helden and E. C. Sissons, of Montreal, and others.

Chaudiere Basin Power Company, Limited, Montreal, Que., incorporated, capital \$150,000. Incorporators, F. H. Manley, J. N. McKenzie, A. G. Wilkinson and G. P. Grant, all of Montreal.

St. Johns Temagami Gold and Silver Mining Company, Limited, St. Johns Que., incorporated, capital \$795,000. Incorporators, J. Comeau, M. Robert, E. Longlois and others.

Oneida Lime Company, Limited, Hamilton, Ont., capital \$20,000. Incorporators, W. Anderson, W. B. Anderson and A. Ward.

Loughborough Mica Company, Limited, Toronto, Ont. capital \$40,000. Incorporators, E. J. Dignum, A. S. Rogers, L. E. Austin, William Williamson and H. W. Williamson.

The Goulais River, Land and Lumber Company, Limited, Sault Ste. Marie, Ont., capital, \$40,000. Provisional directors, F. E. Baldwin, T. Kirby, N. W. Kirby, A. W. Loveys and W. Thayer.

Imperial Stove Works, Limited, Morrisburg, Ont., capital \$100,000. Incorporators, Andrew Brader, Salem Coons, Irwin Hilliard, William Duke and James Ferguson.

The Aylmer Packing Company, Aylmer, Ont., capital \$40,000. Incorporators, N. Brooker, C. W. St. Clare, A. G. Moore, D. C. Davis and J. M. Wrong.

Byron Telephone Company, Limited, Byron, Ont., capital \$15,000. Incorporators, R. McEwan, A. J. Rollins, H. Wickerson, W. Meriam and A. Kains.

The Crystal Bay Canning Company, Limited, Kingston, Ont., capital \$50,000. Incorporators, G. A. McGowan, L. L. Henderson, J. H. Bell, E. Walsh, J. W. Edwards, L. C. Robinson and D. H. R. Robinson.

Personal.

The Randolph Macdonald Company, Limited, contractors, having completed extensive contracts for the Dominion Government in the Province of Quebec, have removed their head office from Three Rivers, Que., to Crown Life Insurance Building, Toronto.

Alexander Collins has been appointed superintendent of the Niagara Falls waterworks, to succeed Robert Little.

John Astley has been appointed Engineer of Construction at Winnipeg, Man., at a salary of \$175 per month. Mr. Astley was formerly assistant city engineer.

Business Notes.

Beauchemin & Neault, lumber dealers, Three Rivers, Que., have registered.

It is stated that A. Leclerc, lumber manufacturer, of St. Lucien, Que., has assigned.

Nicholson, Curtis & Vick, contractors and stone dealers, Toronto, have dissolved partnership.

The creditors of the Provincial Construction Company, Toronto, meet on 28th inst. for the purpose of appointing a permanent liquidator.

The Kelsey Heating & Ventilating Company, Toronto, have assigned on the demand of A. D. Kennelly. A meeting of creditors has been arranged for the 27th inst.

G. A. Stinson & Company, of Toronto, have recently purchased \$25,000, bonds of the town of Goderich, Ont., bearing 5 per cent. interest, and maturing in 20 annual instalments.

The foundry and plant of Johnston & McGregor, Smiths Falls, Ont., is for sale by tender and J. McEwen, the vendors' solicitor, of the same town, will receive bids up to February 28th.

Rupert G. Haley and Thomas Bell, St. John N. B., liquidators of the A. L. Wright Lumber Company, Limited, are asking for tenders up to March 17th for the timber lands, timber, mill, camping outfits, horses, wagons and other general effects of the concern. The timber lands are situated on the Coverdale river, in Albert County, N. B., and consist of 9,463 acres granted lands, and 830 acres farm leased lands, a total of 28,465 acres. The mill was erected at a cost of \$30,000.00, and is replete with electric lighting plant, telephone line, workmen's houses, stores, barns and outhouses, all the buildings being wired and lighted by electricity. There are about three million feet of logs in stock.

The latest company to negotiate to bring natural gas into the Forest City is the North American Oil & Gas Company, who are seeking to get distribution rights. The company have a capital of \$100,000, and claim to be able to supply citizens at a rate of 35 to 40 cents per 1,000 cubic feet.

The Standard Foundry Company, of Longueuil, Que., have dissolved.

The Mutual Life Insurance Company of Canada, have offered to purchase \$50,000 of 30-year five per cent. school bonds of Medicine Hat, Alberta, at 95.

Money in Cement.

The annual meeting of the International Portland Cement company held last week in Goldsmith's hall, Ottawa, under the chairmanship of Sir Sanford Fleming, was the most successful and satisfactory in the history of the company. Optimism was the prevailing note of the directors' report, presented to the meeting by J. S. Irwin, managing director, and the greatest enthusiasm prevailed among the large number of shareholders present. The following is an extract from this report: "Your directors are pleased to inform you that good progress is now being made on the new extensions to the plant and the installation of new machinery, which will considerably increase the capacity of the works during the year 1908. These extensions will give to the present plant, when completed, its highest standard of efficiency. So great has been the demand, during the past year, for cement of the high quality furnished by your company, that our sales department could have sold double our output had we been able to produce the cement. In other words,—we could have sold nearly four hundred thousand barrels more of the International brand of cement had we been able to produce it. Our prospects for 1908 are most promising. We have already sold for spring and summer delivery nearly one hundred per cent. more cement than we sold at this time last year; in fact we have never booked orders for so much cement at this period of the year during our experience in the business. In almost every case the orders given to us by our old customers have been increased to a marked degree." The financial report issued to the shareholders was a gratifying one, showing as it did that the plant during the year had made net earnings of \$269,478.54.

Some two hundred shareholders attended the annual meeting of the National Portland Cement Company, held last week in the Labor Temple, Toronto, and it was estimated that nearly \$900,000 of the capital stock was represented out of a total of \$1,000,000. The chief point for discussion was in regard to the operation of new marl beds near Hanover, the old fields at Wilder Lake, near Durham, having become played out. It was decided to go on with the new beds, 175 acres in extent, their product having been tested, surveyed and analyzed by the company's expert with entirely satisfactory results. Operations will be commenced about April 1st, when it is expected that, at a conservative estimate, between 30,000 and 40,000 barrels will be produced per month.

Proportions for Concrete and Methods of Mixing.

Continued from page 15.

in one day. It is always best, however, to err on the safe side by having too large a machine than too small a one. Have one that is capable of mixing the day's work in three-quarters of a working day, allowing three minutes for mixing a batch and assuming a barrel of cement to contain 3.8 cubic feet, which equals 100 lbs. per cubic foot, and is now becoming quite general.

The greatest problem of operating a mixer is that of feeding and removing concrete. A mixer of the proper size will always mix faster than this can be accomplished. The simplest way of feeding, which is suitable for small jobs, is to build a wheelbarrow run to the feeding hopper and dump directly in. The hoppers which are attached to machines of some makes, which lie on the ground and are filled by wheelbarrows and then lifted by the power that drives the mixer and dump into the machine, are very convenient and economical ways for handling concrete on small jobs, and reduce the cost somewhat from the first method named. For large installations more economical methods should be obtained. Local conditions have such an influence upon the arrangement of plant that no general rule can be given.

On a job the writer had the past year where over 125 yards had to be handled every day and where there was no room for storage on the ground, local conditions determined the following method. The job was situated between two buildings. There was a canal between them in which the concrete was placed. On one side there was just room enough for a railroad track, on the other there was a width of 25 feet. To handle materials elevated bins holding about 50 tons of stone and 30 tons of sand were built high enough so that the aggregates were drawn through spouts into a measuring box, stone in front, sand behind, cement on top. This was pivoted to tilt and dump directly into mixer, which in turn was raised high enough for tram cars on rails to run underneath and receive the discharge,

a four bag batch at a time. Two derricks were erected on the edge of the canal with booms long enough to reach across. Skips were set into the freight cars, filled by hand and swung by the derricks and dumped into the elevated bins. This method proved very satisfactory and economical. Fifteen freight cars were unloaded daily. After one was unloaded it was pulled ahead by block and tackle by the hoisting engine and replaced by another. The derricks commanded three cars at a time. By this means the cost of unloading cars and measuring and mixing was \$338 per cubic yard, and the cost of the installation, maintenance, dismantling and rental, which handled 3,140 yards, was \$1,571.93, or \$461 per cubic yard.

In isolated places where crushers have to be erected we have erected elevated bins with bucket elevator and rotary screen high enough to draw materials into the measuring hopper and discharge directly into the mixer, and found the cost of mixing to be \$.346 per cubic yard and the installation to vary from \$1.98 per yard for a small volume of concrete to \$.61 per yard for a large volume. Where conditions require cars to be unloaded on to the ground or where teams can dump close to the mixer a very convenient way is to set a measuring hopper flush with the surface of the ground, dig a hole into which the mixer is set so that the hopper dumps directly into it and set the elevator which handles the material into a building low enough to receive the discharge from the mixer. This set-up is inconvenient if the concrete is not to be lifted to a considerable height, as in building work. For feeding a mixer in this way the two wheelbarrows, holding 6 cubic feet, will be found very convenient and economical to use, because they handle a considerable volume at one time.

The above methods, though briefly described, may throw some light upon handling concrete, the economy of which depends upon handling it in large masses without the requirement of much labor. It is possible, however, as the writer has learned by experience, to spend so much in the installation of an economical mechani-

cal plant that the incidental costs of installation offset the saving in cost of the mixing of a comparatively labor cost of operating. Therefore trained judgment is always the best of a very simple set-up, with higher small volume of concrete over the cost guide in the long run.

Rules for Measurements.

The "National Builder" gives the following as a basis for making measurements in certain cases:

A pint of water weighs nearly 1 pound, and is equal to about 27 cubic inches, or a square box 3 inches long, 3 inches wide, and 3 inches deep.

A quart of water weighs nearly 2 pounds, and is equal to a square box of about 4 by 4 inches, and 3 1-2 inches deep.

A gallon of water weighs from 8 to 10 pounds, according to the size of the gallon, and is equal to a box 6 x 6 inches square, and 6, 7 or 7 1-2 inches deep.

A cubic foot of water weighs nearly 64 pounds (more correctly 62 1-2 pounds), and contains from 7 to 8 gallons, according to the kind of gallons used.

A peck is equal to a box 8 x 8 inches square and 8 inches deep.

A bushel almost fills a box 12 by 12 inches square and 24 inches deep, or 2 cubic feet.

A barrel of water almost fills a box 2 by 2 feet square and 1 1-2 feet deep, or 6 cubic feet.

Petroleum barrels contain 40 gallons, or nearly 5 cubic feet.

Dominion Wire Rope Company Hold Annual Meeting.

The annual meeting of the shareholders of the Dominion Wire Rope Company, Limited, was held at the head office, Imperial Bank Chambers, Montreal, on Thursday last, when the following directors were re-elected for the ensuing year: F. W. Fairman, F. H. Hopkins, C. W. Colby, Geo. P. Butters, and E. E. Fairman.

At the meeting of the directors, the following officers were re-elected for the ensuing year: F. W. Fairman, president; F. H. Hopkins, vice-president and managing director, and J. J. Rosevear, secretary-treasurer

Payments for Contract Extras.

It is the clear purpose in the preparation of any well-considered contract specifications so to cover the proposed work as to include all parts of it, and thus avoid the disputes or contested claims which characterize the completion of nine contracts out of ten, or perhaps ninety-nine out of every hundred. The specifications are intended to be so complete as well as so discriminating as to show what must be done, not only in connection

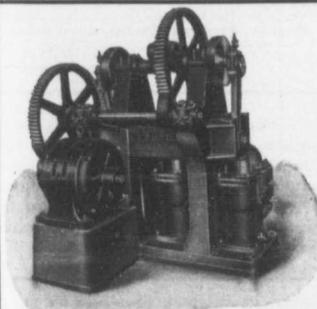
with the main features of the work involved, but also as to any preparatory operations, so that the contractor shall be in no doubt as to what he is to be paid for the direct work of the contract and for any preliminary or preparatory construction, if there be any. In spite of the most scrupulous consideration by the engineer of every provision of the specifications, it will be invariably found, if the work is of sufficient magnitude to include a variety of operations, that when it is

completed there is enough doubt either as to the character of some of the work done, or in the language of the provisions covering its performance, and in the items of payment relating to it, to open the way for extra claims on the part of the contractor and for contesting their payment on the part of engineer, both, it may be assumed, acting in good faith.

The purpose of the engineer is, or ought to be, to provide for his client a reasonable and economical construc-

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TENDERS AND FOR SALE DEPARTMENT



Department of Railways and Canals, Canada

TRENT CANAL.

ONTARIO-RICE LAKE DIVISION.

SECTION No. 3.

NOTICE TO CONTRACTORS.

Sealed tenders addressed to the undersigned and endorsed "Tender for Trent Canal," will be received until 10 o'clock on Thursday, 12th March, 1908, for the works connected with the construction of Section No. 3, Ontario-Rice Lake Division of the Canal.

Plans, specifications and the form of the contract to be entered into, can be seen on and after the 5th February, 1908, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, at the office of the Superintending Engineer, Trent Canal, Peterboro, Ont., and at the office of Mr. J. B. Brophy, Division Engineer, Trenton, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages Schedule prepared or to be prepared by the Department of Labour, which Schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signatures, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of \$10,000 must accompany each tender, which sum will be forfeited, if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The advertisement dated the 16th January, 1908, is hereby cancelled.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, February 3rd, 1908.

New papers inserting this advertisement without authority from the Department will not be paid for it. 8

Tenders Wanted

for the flooring of the third storey of Nelson school building, also for furnishing Desks for the said School House. Plans and specifications may be seen at the office of T. Clark King, Architect, Lacombe, Alta., up to noon FEBRUARY 29th, 1908. The lowest or any other tender not necessarily accepted.

T. CLARK KING, Architect,
Lacombe, Alta. 9

St. Michael's School Belleville

Tenders addressed to the Rev. D. A. Twomey, Belleville, will be received up to noon, of MONDAY, THE 9TH OF MARCH, 1908, for the erection of a school building for St. Michael's Parish, Belleville. Plans and specifications may be seen at the residence of the Rev. D. A. Twomey, Belleville, or at the office of the Architect, Colborne P. Meredith, Ottawa, on and after Monday, the 2nd March. The lowest or any tender not necessarily accepted. 9

DEBENTURES FOR SALE

Tenders will be received by the undersigned up to SATURDAY, THE FIFTEENTH DAY OF FEBRUARY, A.D. 1908, for the purchase of Twelve Thousand Dollars (\$12,000) worth of debentures of the said Town of Aylmer bearing interest at the rate of six per cent. per annum running for a period of twenty years. Interest and Principal payable in equal yearly sums of \$1,046.22.

JUNIUS BRADLEY,
Town Clerk,
Aylmer, Ontario. 8

Tenders for Furnace for Bolton School

Sealed tenders will be received by the undersigned up to TUESDAY, APRIL 7th, 1908, for installing a furnace for heating and ventilating in Bolton Public School — four rooms. Furnace to be suitable to the requirements of the building and to be placed in position during the summer vacation, 1908.

Lowest or any tender not necessarily accepted.
JNO. MACDONALD,
Secretary of Board, Bolton, Ont. 10

Notice to Contractors

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Tenders Wanted

Separate tenders for all trades, in connection with the erection of an addition to the Canadian Military Institute on University Avenue, will be received by the undersigned up to MARCH 5th, at the Canadian Military Institute or at the office of the Architects.

CHADWICK & BECKETT,
Architects,
18 Toronto Street, Toronto 9

Town of Collingwood

Tenders are invited for the purchase of the following debentures of the Town of Collingwood:

\$8,600 Consolidated Debenture Act, 1899, 30 years, 4½ per cent.

\$7,700 Consolidated Debenture Act, 1889, 30 years, 4½ per cent.

\$6,000 Local Improvements, 20 years, 4¼ per cent.

\$5,800 Water Works, 20 years, 5 per cent.

\$12,000 Good Roads, 20 years, 4½ per cent.

The above debentures are guaranteed by the County of Simcoe.

Tenders to be given for each separate parcel.

Successful tenderer to pay at par in Collingwood and the cost of forwarding debentures.

Tenders, marked "Tenders for Debentures," will be received by the undersigned up to noon, FEBRUARY 28th, 1908.

The highest or any tender not necessarily accepted.

For copies of by-laws and further information apply to J. H. Duncan, Town Clerk.

J. R. ARTHUR,
Chairman Finance Committee. 9

Tenders will be received by the assignee, J. D. Hall, up to March 10th for the purchase of the new Telford saw mill at False Creek, Vancouver. The mill is said to be very favorably situated and has a capacity of 40,000 feet per day.

tion, as expressed by plans and specifications fully and clearly enough to enable any competent contractor to ascertain just what he is expected to do in every particular, should the contract be awarded him. Yet it is not uncommon even at the present time to find a kind of blanket provision in specifications as to some portions of the work, the character or amount of which is indeterminate, or perhaps about which there is much doubt as to its being required at all, and under which provision the contractor must actually make a gamble as to what such a feature of the work is to cost him. Consequently he must either take his chances on escaping the work or name a high price for a large profit.

It is reasonable to assume that a reputable and experienced contractor makes his bid in good faith and intelligently, and yet such a contractor will find himself much at sea in attempting to fix prices for items or features of construction like those just described. It is not surprising that in the execution of such portions of the contract conditions should arise quite different from those either named in the specifications or anticipated by either the contractor or the engineer, nor is it at all remarkable that the contractor and the engineer should take distinctly different views as to the proper payment to be made to the former. Although not specifically so stated in the specifications, neither

party in interest pretends to gauge the hazard; both tacitly recognize it and the engineer plainly warns the contractor that it exists, but practically intimates that the contractor must determine for himself its character and amount and take his chances as to a loss or a profit. This is obviously likely to lead to a costly issue for the owner. As already observed no contractor can afford to gamble for a loss. If he is going to gamble at all, he will inevitably take his chance for the largest profit possible, and in doing so he is simply following the dictates of prudence. Furthermore, the very existence of these doubts, and the lack of clearness in setting forth precisely what is to be

done afford just the opportunities which a shrewd contractor can easily turn to serve him as a basis for plausible claims for extras. When the plans and specifications show or express with clearness all the items of work to be done, the latter are outlined with precision and accuracy, effectively preventing any claims for extra work. It follows from this, what is otherwise equally clear, that an engineer's duty is to delimit completely every part of the contract field. No contractor is unreasonable in setting up an extra claim for work which is not plainly covered by the items scheduled in his contract, and in the final settlement experience has shown that he can collect in court a fair compensation for such work.

These observations are applicable to a far greater number of contracts than is ordinarily supposed, although fortunately they are becoming less applicable, as specifications are more

carefully written and as unit price contracts displace those which provide for lump sum payments. On the other hand, the greatly increasing magnitude of structural work and the necessarily more elaborate character of the contracts required for their construction, make it more difficult in a number of ways to eliminate contractors' claims for extras. At the present time these great contracts frequently call for an extraordinary amount of work of considerable variety for the installation of the contractors' plant. Any one of a number of large contracts in various parts of the country, such as a great irrigation reservoir, a modern high masonry dam, or even a great bridge, may ne-

cessitate the construction of a contractor's railway or the excavation and grading of a great yardage of material for the installation of crusher and power plants, storage or fabri-

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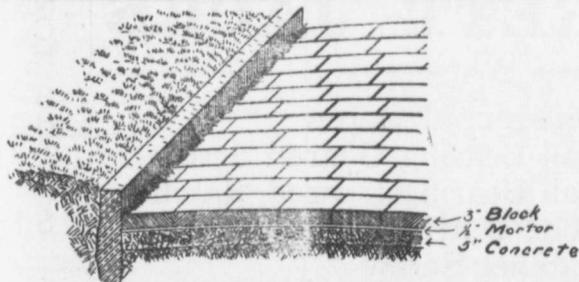
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eration yards, and other similar purposes. While it may appear sufficient to warn the contractor to make a complete examination of the vicinity and form his own estimates of cost, as no allowance will be made for any part of the installation of his plant, there may be occasions where such a procedure is not advisable. It is by no means unheard of that the precise location of a great work may be somewhat changed at the last moment, and enough to demoralize materially a contractor's estimate of this part of his cost. It is not unreasonable for him under these circumstances to claim compensation for his increased cost of installation.

There obviously may be danger in the owner assuming the expense of a contractor's installation; in fact, that procedure, as a rule, is certainly to be avoided. At the same time, where there are such items as large quantities of excavation or well-defined classes of construction, all of which are capable of complete control by the engineer, it may be best to include them under suitable items in the contract. All possible claims for extras would be avoided, and in at least some cases decided advantages would be attained. In this, as in every other item, the specifications should make clear just what is allowed. There has

also been no little difficulty experienced in connection with specifications in which the full application of some one payment item has not been clearly indicated. Wherever there is obscurity of language or of definition the contractor is put into a position of doubt as to what is required of him. Under those circumstances, the engineer has failed to make clear his requirements and the contractor can scarcely be considered unreasonable if he makes claim for extra compensation for something done which it cannot be conclusively shown he was required to do.—The Engineering Record.



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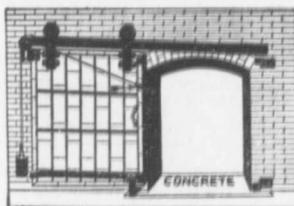
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**Niagara Falls and the Power
Companies.**

Dr. J. W. Spencer, the British scientist, commissioned by the Geological Survey to investigate the Niagara Falls problem, discussed last week the effect of the utilization of its waters by power plants upon its scenic beauty. At the instance of the American Civic Federation, Dr. Spencer has appeared before the House, Rivers and Harbors Commission, and presented data concerning the request of the Ontario Power Company for a power franchise. To develop this power would require forty thousand cubic feet of water per second, which, Dr. Spencer contended, is from twenty to twenty-five per cent. of the discharge of the Niagara river, and would greatly impair the characteristics of the Whirlpool Rapids, lower the river bed up to the Falls, break up the surface rock at the foot of the American Falls and Goat Island, and thereby cause a more rapid recession of the Horseshoe.

"As the beginning of these rapids is marked by a rim over which the flow of water is already thin," said Dr. Spencer, "the diversion of the water would destroy about 800 feet of flow on the eastern side of the great Horseshoe, and break up the American Falls into separated streams. The total length of both falls would be contracted roughly from four thousand feet to sixteen hundred feet, and the diameter of the great falls from 1,200 to 800 feet. This diversion of the water will produce a shrinkage of the Horseshoe, so that what remains will be entirely on the Canadian side of the boundary line."

He argued that the lowering of the water in the basin above the upper rapids would increase the slope of the river, so that the surface of Lake Erie will be lowered by three feet, which in turn would lower Lakes Huron and Michigan. Already, with a partial use, Lake Erie has been lowered ten inches. This amount of lowering includes that of the Chicago Canal, which at present is taking five thousand cubic feet a second.

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The variety of uses to which concrete is now put and the frequency with which it is desirable to have it waterproof, give great importance to a series of experiments conducted by Mr. Richard Heyward Gaines, a chemist of the New York Board of Water Supply. Mr. Gaines describes two processes and says that they may be used singly or together. He thus provides three ways of accomplishing the desired result. One is substituting for the mixing water in the preparation of the concrete a solution of a certain class of chemicals designated as "electrolytes." The most economical and serviceable salt for the purpose is sulphate of aluminium. The second expedient is replacing from five to ten percent. of the cement with an equal quantity of finely ground colloidal clay, this being mixed with the cement before the water is added. To illustrate the effect of these methods, Mr. Gaines gives the following notes: "Two lots of concrete are prepared from the same ingredients and in the same proportions, but not treated by any of his special methods. Specimens from the first, 28 days old under 80 pounds pressure, allowed 524 grams of water to pass through in ten minutes, and specimens from the other, 33 grams. Two lots, identical in every other way except for the addition of an alum solution, allowed only 2 grams to come through. Concrete in which there was 10 per cent. of clay, but no electrolyte, did not allow a drop to penetrate. When both an electrolyte and clay had been used there was an unmeasurable trace.

These tests were made with two-inch cubes, and the supposition is that a slightly greater thickness would have been absolutely impermeable. Another result of treatment here mentioned is that the strength of the concrete is increased from twenty to fifty per cent. Mr. Gaines believes that the ions, or particles, carrying electrical charges in the water, promote chemical combinations and also form a glue-like substance in the mixture.

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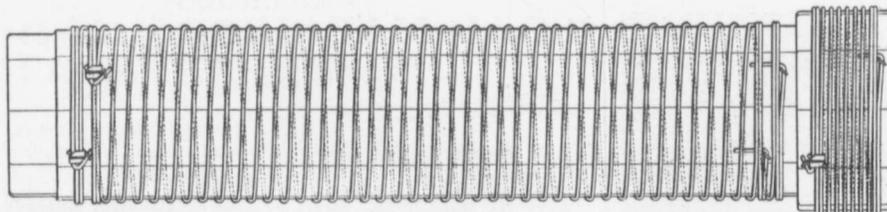
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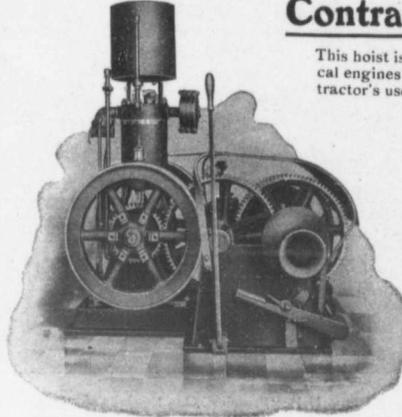
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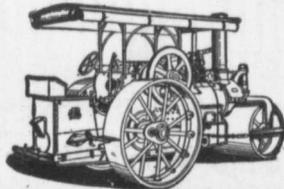
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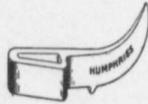
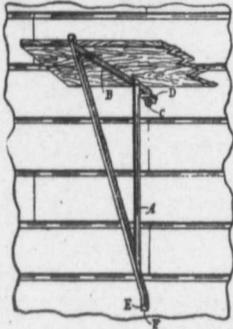
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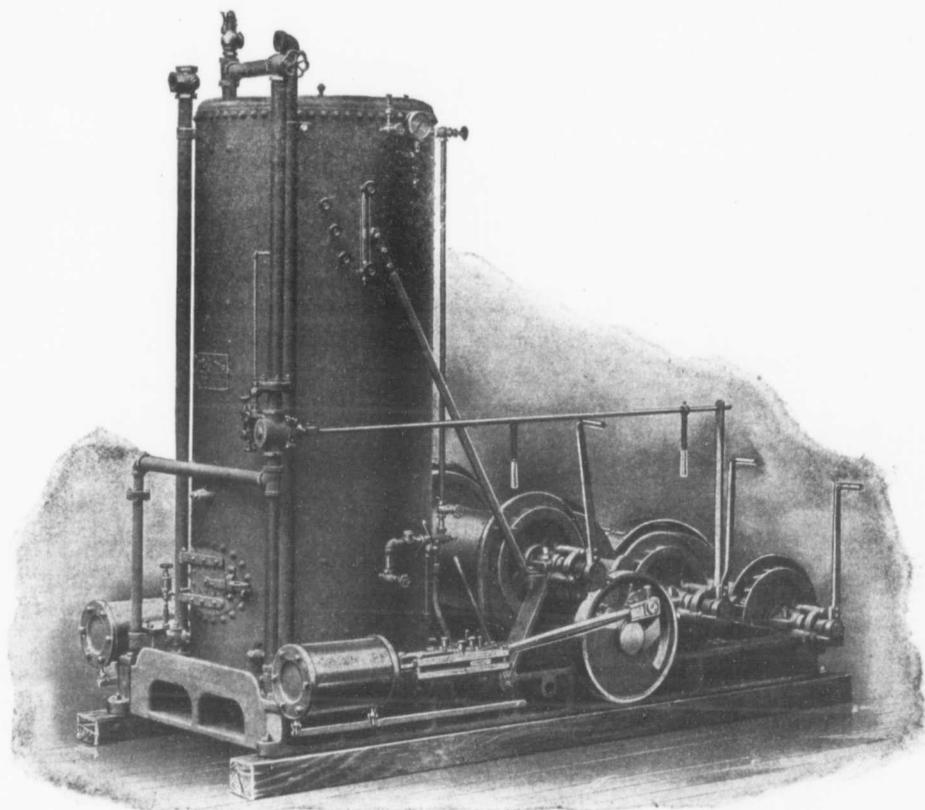
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