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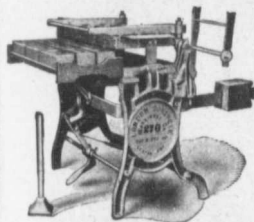
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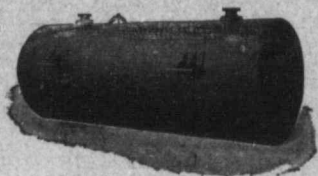
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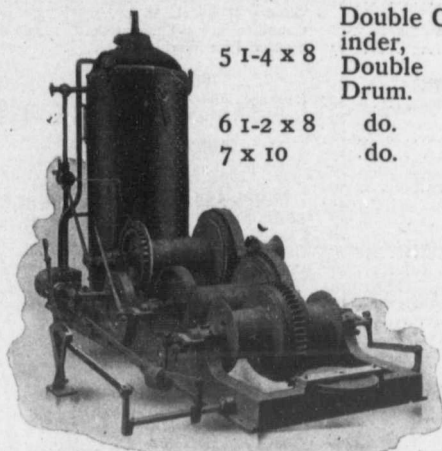
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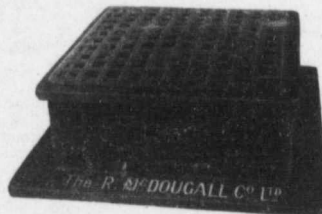
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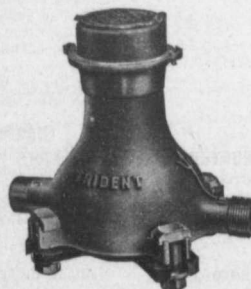
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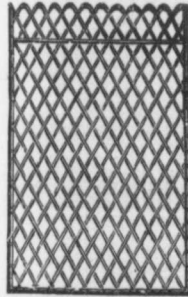
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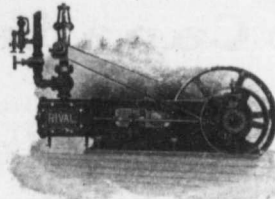
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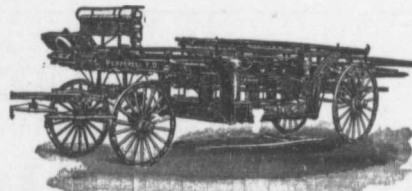


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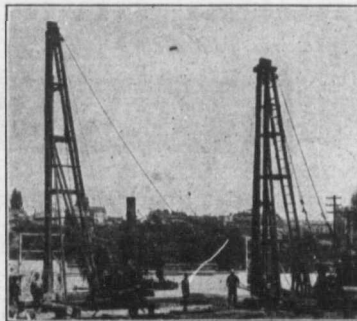
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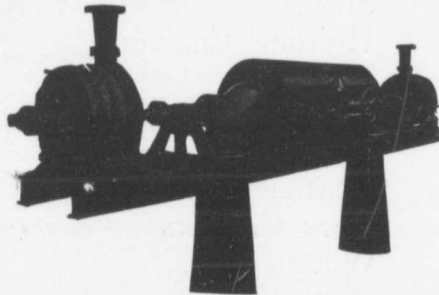


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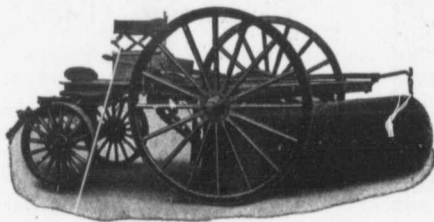
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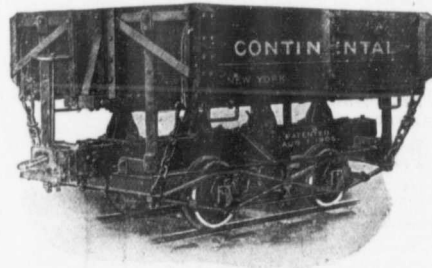
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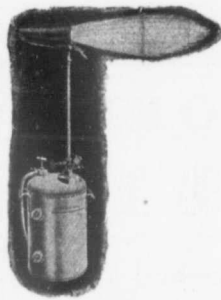
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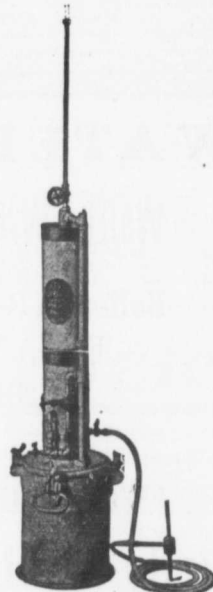
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larity in delivery of papers.

CONTRACTING UNDER DIFFICULTIES.

Among many of the leading contractors of this country there has been for some time past a growing dissatisfaction with the difficulties under which they are called upon to execute costly engineering feats. Not long since, important contracts were comparatively few in number, but during the past few years the magnitude of this country's engineering enterprises has been equalled only by their number. With this mushroom growth there has also become intermingled numerous difficulties of a more or less intricate nature between the two central figures in an engineering contract, the engineer and contractor.

Engineers of youthful years, and with a modicum of experience, are being turned out from Toronto, Queen's and McGill in batches of hundreds each year. Many of these inexperienced youths find themselves almost immediately on graduation called upon to take charge of enterprises which in former years men of long experience would have declined to undertake. This has been inevitable. The country's phenomenal expansion has made it so. 'Tis but another instance proving the modern adage, "This is the young man's age." But difficulties have arisen for the contractor in this regard. He finds himself called upon to obey the dictatorial nod of, it may be, his own sons—youths with an engineering diploma. That, however, is but

a small matter in comparison with other difficulties to which this modern age of great undertakings has given birth.

The successful and harmonious completion of any contract has of late been seriously menaced by a maximum of work having to be crowded into a minimum of time without the plans for such work being sufficiently explicit as to permit of the contractor undertaking his work with promptness and despatch. Of course there is much to be said on both sides of this question. The engineer has had insufficient time, perhaps at the time tenders are let, to furnish detailed and final specifications, and has perforce to insert a proviso by which he will be allowed the opportunity of subsequently modifying more or less seriously his original plans. Here is where contractors claim an injustice is being done them. The time limit set for the completion of a contract is usually very limited, so much so that every day between the time it is undertaken and completed is of value. Nevertheless, it not infrequently happens that a considerable portion of this valuable period is necessarily lost because the engineer's plans are liable to modification or else so lacking in explicitness that the contractor is at a loss to know just how to proceed, what machinery and material to supply, or what labor to secure.

The undesirability of such a state of affairs and the serious difficulties that sooner or later are likely to grow therefrom have caused several prominent contractors to consider a remedy. It has been suggested that a permanent government board of, say, three members be appointed, to whom might be submitted all grievances between engineers and contractors, with a view to the preservation of harmony and the obviation of possible disputes which an ordinary court of law can very inadequately understand. The whole question should be very frankly and thoroughly discussed, views on both sides considered, and an honest attempt made by contractors and engineers alike to establish a board of arbitration, mutually satisfactory, and competent to care for the interests of all concerned.

PROFIT SHARING WITH EMPLOYEES.

A wish to share in the profits of their employers is one which has taken strong hold of the minds of ambitious employes in many large industrial concerns. A typical example of the plans adopted is that of a manufacturing company at Bridgeport, Conn. Its chief provisions are as follows:

(1) Employer and employe agree to share both profits and losses.

(2) Net gain or loss is ascertained by deducting from the gross result of the inventory on the first of February all expenses for the year previous of every kind, including depreciation of buildings, tools, machinery, and bad debts. In the case of gain, the capital invested, as shown by the inventory, shall first draw 6 per cent. interest, "or, in case there is less than that amount, shall draw what there is, in liquidation of its claim"; the balance, then remaining, to be divided between the company and the individual employe in the proportion which the capital invested bears to his total wages for the year.

(3) For each current year, one-tenth of the wages of every employe, who is a party to the contract, is withheld each week. In case there is not a net loss on the entire business of the year, this reserved money, together with any accrued profit, as figured above, is paid to the employe, on or before March 1, of each succeeding year.

(4) In case of a net loss on the business of the entire year, without figuring any dividend as above provided for capital, this loss is divided between the company and the employe in the same method as that prescribed for the dividing of profit; but in no case does the employe become responsible for losses greater than the amount reserved from his wages.

(5) Other employes may become parties to this contract upon the invitation of the company. Any employe may withdraw from the contract at any time, and from the firm's employ, but the company then holds the right to retain the 10 per cent. reserve till the end of the current year. In case it is so held, its

owner shares in the company's profit or losses.

(6) The company may discharge any of its employes, but in that case he shall have the option of withdrawing his full reserve, or of leaving it till the end of the year, to share in profits and losses.

(7) It is agreed by the company that none of its employes who signs this contract shall be temporarily retired from work so long as the company has any work of the kind he is accustomed to do; but if there is a shortage of work in the hands of the company it shall reduce the hours of work, and so divide the work among its employes. If at any time an employe becomes sick or incapacitated to perform his duties, and has a certificate of a reputable physician that he is so incapacitated, he may draw on his reserve wages at a rate not greater than six dollars a week, without affecting his interests in the profits at the end of the year. If any employe is injured by any accident while in the employ of the company, the company, at its own expense, provides him with a competent physician or surgeon, upon application stating that such services are needed.

The Bridgeport company does not offer this contract to all its labor force, but one is made (when applied for by the employe) with the skilled laborers. The common labor, shiftless and restless as it usually is, is allowed to come and go at will, but is watched closely for individual evidences of capability and reliability. There are consequently three classes of employes: those who work by the day or week and take no interest in their work other than the money they get out of it, those who are in line for a profit and loss sharing contract, and contract men. It is the company's practice not to invite further signatures to a contract when three-fourths of their skilled labor are working under it. The result is that out of a labor force of about 250, eighty are actually enrolled and there is a long waiting list. The plan is said to give satisfaction to the company in the increased efficiency of service, and the labor is well satisfied, being especially attracted by the fea-

ture that allows them to provide for their families in case of sickness.

The unique feature of this plan is that it is both profit and loss sharing. Every man would like to divide with his employer from the earnings of a business, but if there is a loss the proposition is one of an entirely different complexion.

BUILD NOW.

The money stringency has had some rather peculiar effects on the building situation during the past couple of months. Immediately prior to the "scare" material and labor were at a maximum. Prices of the former were unprecedentedly high and labor thought itself firmly secure in abundant employment. In a surprisingly short time the situation was reversed. Unmistakably the public have had enough of stock depreciation. More and more will it be brought home to them that real estate and building constitute infinitely safer investments and it will not be long before we once more have a structural boom. The men who are far-sighted enough will without delay close up contracts for next season's building operations and get started at as early a date as possible. Those who prefer to postpone contemplated structures for a year or so will pay the penalty in a greatly increased expenditure.

REMEDY IS IN HANDS OF BANKS.

In a general review of the financial situation in the United States the "Southern Lumberman" says:

"One thing is certain, all the money that is not in the banks as reserves is in the hands of individuals who are hoarding it out of fear that conditions will get worse than they now are. This is a fear that certainly cannot be dissipated by the banks joining in the hoarding. Unless something is done, conditions will get worse, and in our judgment, if present conditions are much longer continued, the banks will find very soon that their reserves, instead of being conserved or increased, will begin to diminish. Liquidation has gone about as far as it can go until some measure of business is resumed, unless the property of the

people is to be sacrificed at prices so low as to draw money from these hoarders — and this means practical bankruptcy for thousands of concerns. Property that has no value to command credit has but a small value at a sale.

"The banks of the country were very urgent in their plea that their patrons display patriotism and fortitude, and patriotism and fortitude and patience were manifested in a remarkable degree. All sorts of inconveniences were cheerfully submitted to, and anything the banks said was accepted and lived up to. It is not too much to say, however, that the business people are growing very restless. They want to see something of a spirit of reciprocity on the part of these banks that have got the money. They think the situation in a large measure is squarely up to the banks, and that it is for them to say whether or not improvement shall come, and when."

The same applies to Canada.

CONTRACTOR WINS.

After nearly thirty minutes deliberation, the jury in the Toronto Assizes last week returned a verdict in favor of Samuel R. Alexander, a contractor, who was being sued by the parents of the late J. H. Rigby for \$5,000 damages, and by one, Robert Dawson, for \$1,500. Both the men were employed as carpenters by the defendant on a house on Admiral Crescent doing scaffold work. The scaffold collapsed, and Rigby was killed and Dawson suffered injuries which prevented him from carrying on his trade for several months.

CANADA IN NO NEED OF ENGINEERS.

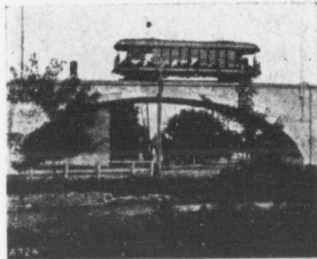
Lord Stratheona, High Commissioner for Canada in London, Eng., states that he is informed by the Minister of the Interior at Ottawa that there will be no work in Canada for surveyors or engineers before next spring, by which time it is expected that the demand will be fully met by those on the spot, and that such persons seeking employment should be dissuaded from proceeding to the Dominion at the present time.

A Concrete Railway Bridge

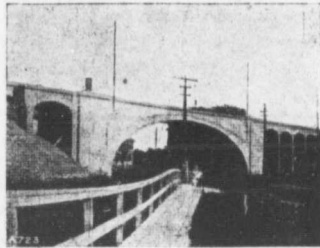
There has recently been constructed by the Niagara, St. Catharines & Toronto Railway one of the largest concrete railway bridges in the Dominion. This has been constructed over Oak street in Merriton, along a canal raceway, while the sections of trestle leading up to the bridge at either end are filled in. The bridge consists of one 80 foot clear span and four 15 foot spans. Medium steel re-

depth of 4 feet above the foundations, and the third was used in the foundations of the piers and abutments.

The reinforcements on the large arch consist of 1 1/4 inch medium steel round bars, 6 inch centres, connected together by turnbuckles. The small arches are reinforced by 3/4 inch round steel, 1 foot centres, while the small piers are reinforced vertic-



Main Arch—80 feet Span.



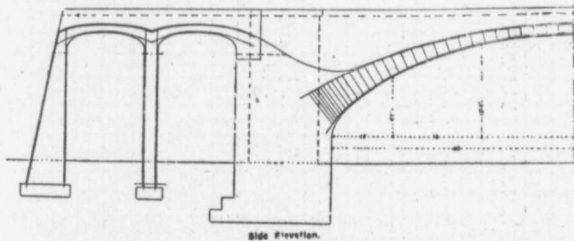
Side Arches—15 feet Span.

inforcements of not less than 60,000 pounds per square inch and an elastic limit of not less than 30,000 pounds per square inch were used throughout. The longitudinal and transverse bars were so fastened together at all intersections as to form a solid network in the concrete.

Three grades of concrete were used in the construction, all of the best

ally and longitudinally by round steel bars, the spans of walls vertically and longitudinally with twisted steel bars every 3 feet. The rims of arches were deposited in transversal blocks about 10 feet long, one block being allowed to harden before the next block was deposited.

At the south end of the arch there is a reinforced concrete wing wall 50



Side Elevation.

Portland cement, clear coarse sand, and clean broken stone free of dust.

The first class was used exclusively for rims of arches as far as the springing planes, and also on the parapet walls and in wing walls of abutments. It consisted of 1 part Portland cement, 2 of sand, and 4 of broken stone. The second class was used in the body of the piers from the springing plane of the arches to a

feet long, extending at an angle of 45 degrees with the line of the arch. The base near the arch is 12 feet wide, while 6 feet above it is 5 feet wide and 1 1/2 feet wide at the top, which is 27 feet above the ground. The wall is reinforced throughout with twisted steel bars at the outer underside and the inner upper side of the base as well as vertically and horizontally. The whole structure required 1,300

cubic yards of concrete and 23 tons of steel, and the main arch, which has a 20 foot rise, is capable of sustaining two 150 ton locomotives.

ELECTRIC POWER FROM WIND.

According to Consul-General Richard Guenther, of Frankfort, German papers state that in Germany wind motors as power generators for use in agricultural and industrial pursuits are rarely met with, but that in Denmark their use has increased very greatly. The Consul-General continues:

"Since 1897 the Danish Government has contributed about \$28,000 for equipments and has even lately erected an experimental station at Askoe. A technical writer describes these experiments, which were made on the initiative of the Danish Government, and also some of the electric works in Denmark which generate electricity by means of wind motors. According to his statements, motors with four wings have given the best results, as a smaller number of wings does not fully utilize the wind power, while a larger number acts detrimentally upon the wind current between the wings.

"If a medium large wind motor is used with a wing surface of about forty-eight square meters (one square metre equals 10.764 square feet), eight horse-power is obtained at a wind velocity of six metres per second (one metre equals 3.28 feet). At a velocity of eight metres the horse-power is more than doubled. A wind with a velocity of eight metres per second is no rarity. The weather reports classify it as No. 3, while the highest wind velocity is No. 12. Since 1903 there has been in existence the Danish Electricity Company, from whose agitation thirty larger and smaller wind power electrical equipments are in operation throughout Denmark."

AN IMMENSE PAPER MILL.

Plans for a paper mill, to cost \$1,500,000, at St. Joe, Idaho, east of Spokane, Wash., have been prepared for the Wood Pulp & Paper Company, of which C. B. Pride is president. The plan is to use the wood of the near-by forests and the plant will give employment to 800 men.

STORM WATER RUNOFF DIAGRAM

DIRECTIONS: Measure the distance from the inlet of the sewer to the farthest point of the area to be drained and from Table II find the time it would take the water falling on the farthest point to reach the sewer. Find this time in the diagram and follow down until the diagonal line giving the percentage of runoff is reached. The figures on the sides then give the runoff in cu ft per sec per acre. In larger areas where water flows in larger channels as in ditches, canals, etc. The velocity of water after reaching the larger streams should be considered.

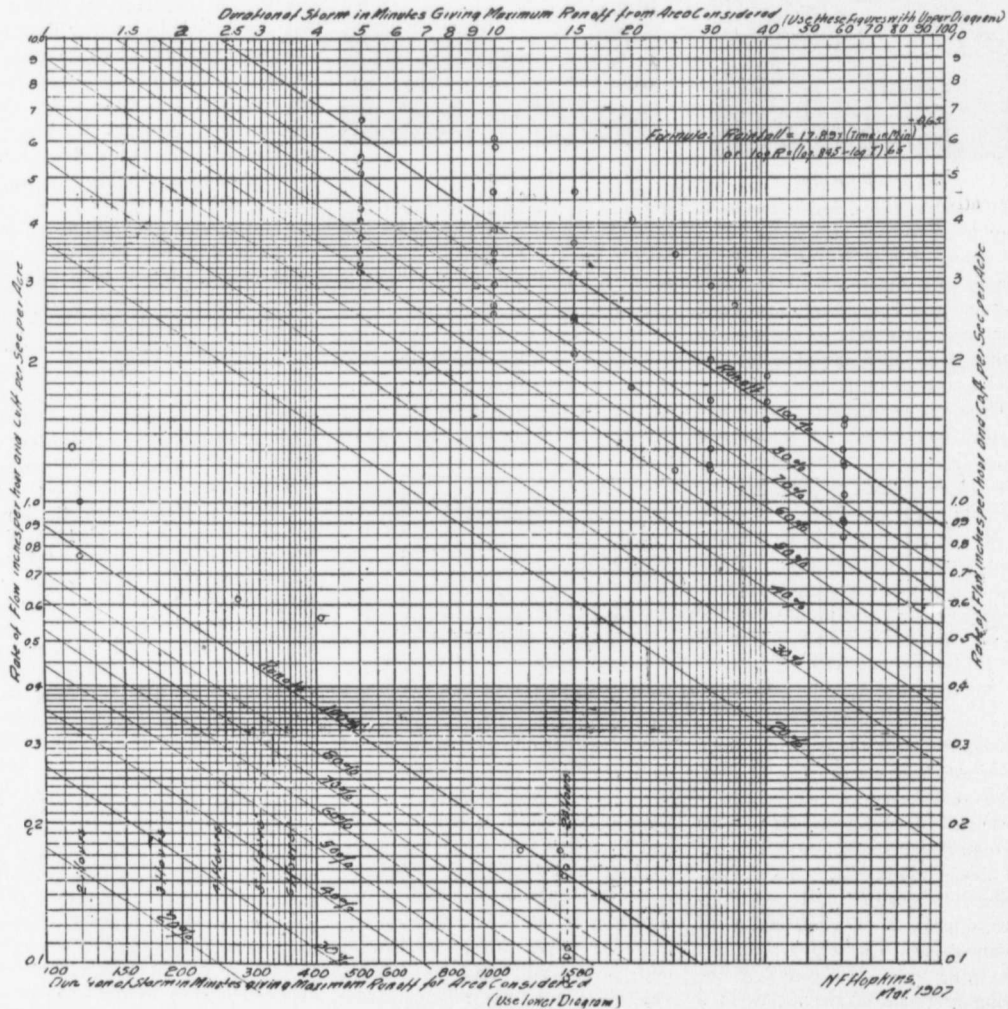
TABLE I
Velocity of flow of water over surface of ground and in small rivulets in feet per second

Average % of ground covered by water	Velocity in feet per second		Velocity in feet per second		Velocity in feet per second	
	on ground	in rivulets	on ground	in rivulets	on ground	in rivulets
1%	2.4	1.6	10%	7.6	51	38
2%	3.4	2.3	15%	9.3	62	45
3%	4.2	2.8	20%	10.7	71	53
4%	4.8	3.4	25%	12.0	80	60
5%	5.3	4.0	30%	13.1	88	66

TABLE II
Compiled from data furnished by Pillsbury Sta. of U.S. Weather Bureau
Small circles show recorded storms

TABLE III
Table showing percentage of stormwater reaching sewer during storm of maximum intensity

	Hill	Middle	Flat
Urban	80%	75%	70%
Suburban	65%	60%	55%
Rural	55%	50%	45%
"	40%	35%	30%
"	35%	30%	25%
"	30%	25%	20%
"	25%	20%	15%
"	20%	15%	10%



STORM WATER RUN OFF.

This diagram is based on the theory that the greatest runoff per second from a given area will occur when the water that has fallen on the farthest point of the watershed is just reaching the point under consideration.

Storms of less duration are, of course often more intense, but as the water from the nearest points has had time to partly drain before the drainage from the farthest point has reached the point considered (as for instance the head of a sewer or culvert) there is at no time as great a runoff as there would be if there was a storm less intense but of longer duration, so that the storm continues until all parts of the drainage area are contributing to the runoff at the point considered.

When a storm lasts longer than the time required for all points to be drained the rate is less and consequently the runoff is not as great as the lesser but more intense storm.

From compilation of precipitation data furnished by the Pittsburgh branch of the United States Weather Bureau, it is found by the accompanying diagram that the storms of maximum precipitation follow the following formula very closely:

$$\text{Let } R = \text{Rainfall in inches per hour} = \text{cu. ft. / sec. / acre.}$$

$$\text{Let } T = \text{Time in minutes of a storm of maximum intensity.}$$

$$\text{Then } R = 17.89 \div T^{0.65} = 17.89 T^{-0.65}$$

$$\text{or log } R = (\log 84.5 - \log T) 0.65.$$

The diagram also shows the various percentages of runoff depending on the topography of the drainage area.

Table No. 1 shows the velocity of flow over the surface of the ground where there are no well-defined channels for the water to flow in so that the water flows over the ground in small rivulets and gutters having a depth of only an inch or two.

Where the water flows in larger ditches or sewers the velocity would, of course, be greater and the time less and, therefore, the time for the water to drain from the farthest point should be calculated by the time required for the surface flow to reach a

ditch or sewer plus the time required for the water to flow in the ditch to the point considered.

Table No. 2 shows the percentage of storm water that will probably reach the sewer during the storm of maximum precipitation. This percentage, of course, varies with the character of the surface, paved streets and areas of course giving greater percentage of runoff than suburban areas where there are lawns, gardens, etc., and much greater than rural or farming land. The runoff also varies with the steepness of the drainage area, especially in suburban and rural areas, and sandy soils give a less runoff than clay soils.

When the length of time (in minutes) required for the water to reach the point considered is determined, the runoff is found from the diagram by following down the line representing the time until it intersects the line representing the percentage of runoff as determined from table No. 2, then following the horizontal line to the side of the diagram is found the runoff in cu. ft. / sec. / acre.

Of course, if it is possible it would be very desirable to gauge the runoff during a storm of maximum duration for the area considered, but as this is usually impossible an approximation by the aid of the diagram can be made during any hard storm, such as often occurs, by observing the rate and duration of rainfall and the time from the beginning of the storm to the time when the runoff from the drainage area is a maximum, also the rate of runoff at the time of maximum runoff and also the rate at the end of the storm.

For example, suppose that a storm of 15 min. duration at the rate of 3 in. per hour (= 3 cu. ft. / sec. / acre) on an area of 200 acres, gives a runoff at the end of the 15 minutes of 130 cu. ft., which increases to a minimum of 200 cu. ft. (or 1 cu. ft. / sec. / acre) at the end of twenty-five minutes. Then it might be assumed that if the drainage area is fairly symmetrical with respect to the point under consideration, that the area contributing to the runoff at the end of fifteen minutes is to the total area as 15² is to 25². This would make the area contributing to the flow at the end of

fifteen minutes equal to 72 acres. The runoff would then be $130 \div 72 = 1.8$ cu. ft. / sec. / acre or a runoff for the area of 50 per cent. of the rainfall.

By referring to the diagram it is found that the probable maximum precipitation for 25 minutes is at the rate of 2.2 in. per hour and 60 per cent. of this would be 1.32 cu. ft. per sec. per acre, or a total runoff for 200 acres of 264 cu. ft. per sec., which might safely be taken as the maximum runoff for the drainage area considered except for storms which occur at intervals of many years and for which it is impossible to provide.

REINFORCED CONCRETE ROOFS.

Some interesting information on roof construction has been embodied in a report on that subject, written by Mr. W. H. S. Wildeblood, Government Engineer, in India.

The writer briefly traces the history of the various forms of roof in use from the last century, and of the attempts made to effect improvements in this direction. The serious disadvantages, not the least of which is its high cost, of the "jack arch" roof, perhaps the most permanent form of roof construction known till recently, are very clearly brought out. The writer then goes on to explain that the introduction in Europe and America of reinforced concrete gave engineers in India the idea of improving their roofs by means of this most useful form of construction. The experiments which have been carried out, and which are described in the note, have been attended by the most satisfactory results, and show that the reinforced concrete roof is by far and away the best in every way. It was found that with forty parts of the ordinary pure kankar lime mortar of the plains and 100 parts of brick ballast, broken to a gauge of one inch, a concrete roof eight inches thick, with even strand wires running through it at intervals of a foot, and having a span of six feet between joists, was capable of bearing distributed loads of over 900 pounds to the square foot. Larger spans, which are no doubt possible, are now being tried.

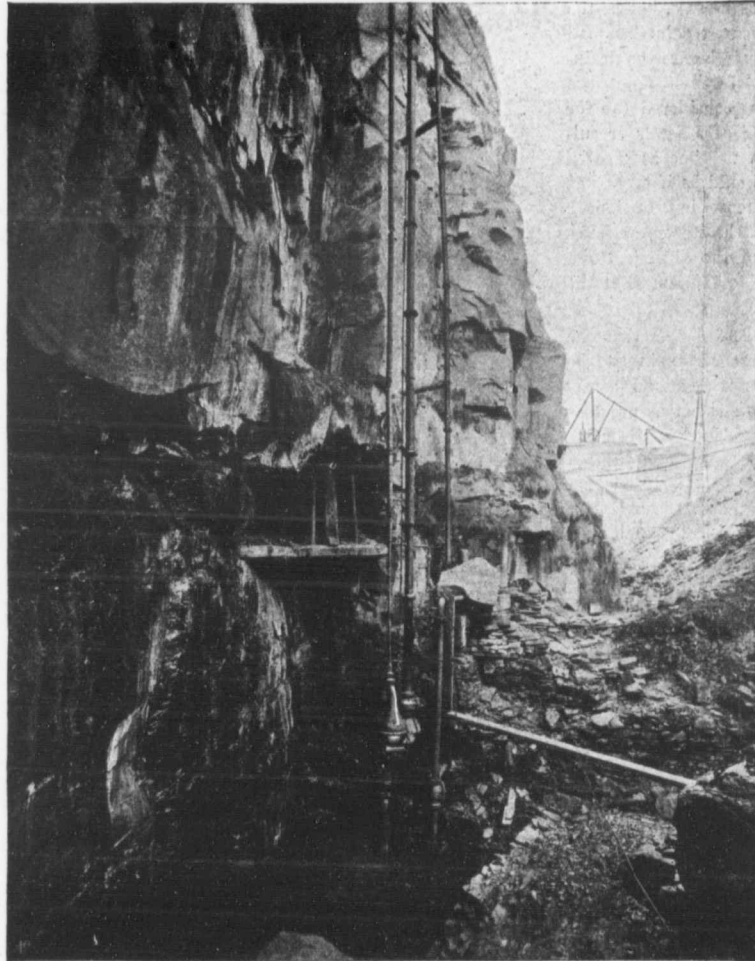
THE PULSOMETER STEAM PUMP.

The "Pulsometer Steam Pump," manufactured by Mussens, Limited, Montreal, and illustrated herewith, will pump water to a total height of from 80 to 90 feet, or under special circumstances, it is claimed, to even greater heights. As a guide to users it may be stated that the pres-

were permanently fixed, its very small size, in proportion to the quantity of water drawn, making it available in a great variety of difficult situations. Should a sudden influx of water occur in any sinking operation and the pulsometer steam pump be drowned out, it can at once be drawn to the top and set to work again without

and water are applied to it.

This pump will also raise, in combination, with the water a large quantity of foreign material such as is met with in the pumping of brick and cement slurry, sewage and sewage sludge, paper pulp, in raising mud from the bottom of rivers, sinking through gravel, sand, etc. Circum-



THE PULSOMETER IN A QUARRY.

sure of steam at the pump for lifts from 20 to 40 feet should not be less than from 20 to 30 pounds per square inch, and for lifts from 40 to 80 feet not less than from 30 to 50 pounds; for higher lifts greater steam pressure is necessary.

The pump works equally well suspended from a chain or rope as if it

delay. It is a comparatively simple matter to suspend a pump of this kind by a chain down a quarry or well, with a rising main attached and a flexible steam hose, especially as the pulsometer steam pump disposes of its own exhaust. Moreover, when the conditions remain constant, it will work day and night provided steam

stances have also occurred where it has been found of advantage to work the pump under water.

The British Columbia General Contract Company, Limited, Vancouver, B.C. are now reported as having gone into voluntary liquidation.

The Finish of Concrete Surfaces

There are a good many methods of finishing concrete surfaces now in use, and it is probably true that most engineers have their favorite methods and are inclined to disregard the merits of all others. It is at times rather important, however, to be able to impart a variety of surface textures to concrete in the same structure, and on this account attention is called to the following comprehensive paper on the subject, read before the Boston Society of Civil Engineers on December 11th, by Mr. C. M. Tuttle, secretary of the Aberthaw Construction Company, of Boston, one of the pioneer companies making a specialty of concrete work.

Granolithic Finish.—The most common type of finish is the troweled or granolithic surface. The objections to it are its flat dull color, the prominence of any crazing or crack which may occur, its slipperiness under foot and the prominence given any inequality in its surface when the light strikes it diagonally. A slight hollow or ridge will show as a shadow and is accentuated greatly. From the construction standpoint there is little objection to this surface, provided the finish is put on before the body of the concrete has set and the surface is properly troweled.

The hard-troweled surface probably protects the under body of concrete from outside moisture as perfectly as any dressing that can be given. In proof that the granolithic surface is waterproof, Mr. Tuttle's firm, as a side line to its general construction, builds a great deal of sidewalk vault-light work. The sidewalk is constructed of glass discs 1 5/8 inches in depth with steel rods between them, all embedded in cement mortar which is troweled hard. These sidewalks properly built are absolutely watertight and give no trouble from moisture working through, even in the form of dampness.

One objection to granolithic finish for protection for concrete masonry is its great brittleness. Any crack which develops in the masonry below will certainly come through to the surface and allow water to get into

the body of the concrete. The only method of finish which would permit cracking of the surface would be some elastic substance like asphalt and paper.

Rough Picked Work.—For wall work it is common to pick the surface with a pointed or toothed tool. This chips off the mortar which may have flushed to the surface and cuts away little particles of the mortar from the aggregate below. The roughening of the surface breaks up the light, gives a lighter, snappier color to the mortar itself, and besides this exposes the color of the aggregate below. Oftentimes where gravel is used the stones show rusting and have various shades of browns and reds. This additional color on the concrete adds a great deal to its appearance and when the dressing is carefully done it gives, in Mr. Tuttle's opinion, as pleasing a surface as can be obtained economically. The dressing removes most of the traces of the form and does away with inequalities which may occur in the work.

The objection to this kind of dressing comes in the removal of the surface mortar, which is the most waterproof part of the concrete. If there is any tendency towards porosity in the mass of concrete, it will absorb more moisture after the dressing than before it and will accentuate the injury from frost. From Mr. Tuttle's observation on well-handled and properly proportioned concrete, he is convinced there is, however, little danger from this, as the material is of itself very dense and waterproof. His firm built the fence around Soldiers Field in Cambridge in 1899. This is in low land along the river, where it is fairly damp. It is exposed fully to the weather and is in thin sections. He has watched this carefully and is unable to discover any surface deterioration from the weathering.

This rough picking shows the masonry honestly as concrete, without any imitation of other material. It gives a pleasing surface and one that can well be used on building work. A fairly good Boston example of this dressing is the little subway station

on State street, near Atlantic avenue, built by Mr. Tuttle's firm under the direction of the Transit Commission. A comparison of the appearance of this dressing and of stone surface is readily afforded by the other subway stations. A laborer with a hand pick will dress between 40 to 50 feet of concrete surface two to three weeks old in one day. With a pneumatic tool laborers will get over 50 to 60 feet. There is but the slightest difference between the work of the hand tool and the machine tool. The depth of the cutting and the fineness of it can, of course, be varied to suit the conditions. This is the surface that the architects use generally for their landscape and other ornamental work. Messrs. Fox & Gale use it in the garden work for Mr. Larz Anderson, of Brookline, and Messrs. Little & Browne used it on the Sicilian garden which the Aberthaw Construction Company built for one of their clients at Beverly Cove. From the point of economy as well as good looks, this dressing for wall surfaces deserves attention.

Rub Mortar Surface.—Mr. Tuttle's firm built the past year two small factories for the Goodell-Pratt Company, at Greenfield, under J. R. Worcester & Company's specifications. The method of finishing the walls struck him as thoroughly good for this class of building and the appearance was satisfactory. They specified as follows:

"After the forms are removed, the concrete shall be thoroughly wet with a brush and then rubbed with a coarse carborundum stone No. 16, bringing the surface to a lather. After this stone has been used sufficiently to take off the rough projections, the lather shall be washed off with a brush and the concrete again wet, and then dusted with a mixture of dry sand and cement, the proportion being one part of cement to two parts of sand. This shall be rubbed into the surface with the coarse No. 16 stone. Care shall be taken not to allow any of the mortar to remain on the surface. To give the final finish, a No. 30 carborundum stone shall be used and the whole surface well rubbed."

(Continued on Page 24)

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Contracts Department

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

CONTRACTS OPEN.

Aylmer, Ont.

D. C. Davis, Secretary, Water and Light Commission, invites tenders up to January 25th for the construction of a 12-inch glazed tile water conduit, about 20,400 feet in length. Specifications at Secretary's office.

Brantford, Ont.

Goold, Shapley and Muir are planning an enlargement to their premises at a probable outlay of several thousand dollars. Construction will start in the spring.

Frank Johnson, manager of the Opera house recently destroyed by fire, is considering the erection of a new building at the corner of Darling and West streets.

Dalhousie, N.B.

The Restigouche Woodworking Company, Limited, will receive tenders up to February 1st for their factory site and buildings, machinery and a large quantity of timber. Further information may be obtained on application to W. S. Montgomery.

East Hope Township, Ont.,

The Government have been asked to assist in deepening the north branch of the Avon river, rendered necessary by the drainage works at the head of the stream. The estimated cost of the project is \$15,000. John Torrance, M.P.P., is heading the movement for local interests.

Fairbank, Ont.

William Brimacombe, Wychwood Park, wants tenders up to February 7th for building a brick school house in this town; plans at post office.

Fernie, B.C.

In his report upon the cost of the necessary improvements to the water system the city engineer recommends extensions to cost \$44,600.

Fredericton, N.B.

C. H. LaBillois, Chief Commissioner, Department of Public Works, wants tenders up to February 24th for construction of following works: Two metal superstructure spans of 86 feet from centre to centre of end bearings trestle tower forming a 28 foot span at Grand Falls station, Drummond,

N.B., and three metal superstructure spans of 117 feet 1 1/4 inches from centre to centre of end bearings at Eel River Bar, Dalhousie, N.B. Specifications of both of the above named works may be seen at the Department in this city.

Huntsville, Que.

It is understood that the G.T.R. and the Canadian Railway News Company have completed the purchase of forty acres of land at Norway Point as a site for their proposed \$100,000 hotel.

Kenora, Ont.

It is reported that the Maple Leaf Milling Company are already planning the reconstruction of their large mill recently destroyed by fire.

A plebiscite has been carried in favor of a street railway.

London, Ont.

Amongst several important presentations brought in by the grand jury at the assizes was a recommendation looking to the erection of a new courthouse and jail. We gather from Mayor Stevely, however, that the chance of the new building being put in hand this year is very remote.

R. C. Struthers and Company have acquired the building now occupied by McMahan and Granger, and will remodel the same on a large scale later in the season. They will also considerably improve their present building.

There is a possibility that McMahan and Granger will remove to Toronto, but they are at present considering two particularly favorable sites, one on York street, the other on King, for the erection of a new warehouse, which, if constructed, will cost in the neighborhood of \$35,000.

Many complaints of late have been received concerning the unsanitary condition of certain school buildings and it is expected that a large appropriation will be made before very long to carry out improvements in this direction.

Medicine Hat, Alta.

E. Roberts, Secretary-Treasurer, wants tenders up to January 31st for \$10,000, five per cent, Protestant school district debentures.

Montreal, Que.

A sum of \$500,000 will probably be set aside for the improvement and extension of the street railway system. The directors will ask the shareholders to confirm the scheme which involves this measure on January 29th, when a special meeting has been called.

At a meeting of the Protestant school board held last week it was decided to adopt a plan for better fire protection in the school buildings; estimated cost \$1,110.

The water committee have approved the specifications for the new 12 million gallon pump and have instructed superintendent Janin to advertise for tenders, which must reach the city clerk by February 20th.

Moncton, N.B.

Tenders are about to be called for steam heating the new \$12,000 fire station on Bonaccord street. Particulars of J. Edington, city engineer.

Napanee, Ont.

Application will be made to the Ontario Legislature for authority to issue debentures to the amount of \$10,000 for improvements to the electric light plant.

New Glasgow, N.S.

Fred Gelinus, Secretary, Department of Public Works, Ottawa, wants tenders up to February 8th for the construction of an extension to the Harbor Commissioner's wharf, according to specifications at offices of C. E. W. Dodwell, Resident Engineer, Halifax, N.S., E. G. Millidge, Resident Engineer, Antigonish, N.S., at the Department, Ottawa, and on application to the local postmaster.

New Liskeard, Ont.

The Women's Institute, of Hanbury, a new settlement near this town, are about to erect a new hall.

New Westminster, B.C.

The Fraser River Improvement Committee have instructed J. F. Le Baron, of Cleveland, Ohio, to examine and report upon proposed improvements to the river so as to admit of the passage of larger vessels. Assistance is being given to the scheme by the council and board of trade.

Notre Dame de Grace, Que.

A by-law will be submitted to the ratepayers on January 23rd to raise \$275,000 by debentures to cover the cost of drainage and other local improvements.

Ottawa, Ont.

Tenders are invited by L. K. Jones, Secretary, Department of Railways and Canals, up to March 12th for the construction of the third section of the Trent Canal. Specifications may be seen on and after the 1st prox. at office of Chief Engineer, Department of Railways and Canals, this city, at office of Superintending Engineer, Trent Canal, Peterborough, Ont., and at office of J. B. Brophy, Division Engineer, Trenton, Ont.

The Exhibition Directors will prepare plans for a fireproof grand stand.

Peterborough, Ont.

At the next session of the Ontario Legislature application will be made by this town for confirmation of various by-laws, including measures to borrow \$25,000 for additions to the Queen Alexandra public school and for granting fixed assessments to the Auburn Woollen and Peter Hamilton Companies.

Saskatoon, Sask.

Excavation has been commenced by the Government on the new \$100,000 post office and customs house.

Plans are being prepared for the extension of the sewerage and water works systems.

St. John, N.B.

At a meeting of the school trustees, held recently, a committee was appointed to consider the enlargement of the Winter street school.

The matter of new buildings for the exhibition was again discussed at the annual meeting of the association and the special committee were asked to submit a report on available sites as soon as possible.

Sydney, N.S.

At a representative meeting of county and town councillors held the other day in this city resolutions were passed urging the Government to procure money for a loan to a railway company proposing to develop Cape Breton and Richmond counties. The railway construction would cost \$13,500 per mile.

Thorold, Ont.

The town council are applying for authority to borrow \$80,000 for the construction of a waterworks system.

Toronto, Ont.

At the annual meetings of the Presbyterian churches held in the city last week, building projects were discussed

in several instances. At St. Andrews, King street, it was decided to repair the damaged institute and offer it for sale, the intention being to erect new buildings on the manse grounds. The Bloor street Presbyterians have decided to make extensive alterations to their Sunday school at a cost of several thousand dollars. The building committee of Bonar church announce that they have secured a site on St. Clarens avenue for a new building, while the Dovercourt Presbyterians have appointed a committee to secure plans for the immediate erection of a Sunday school building at the rear of the church.

A site has been secured by the First Church of Christ, Scientist, for a new \$150,000 temple corner of St. George street and Lowther avenue.

The extension to Leslie street school will be put in hand as soon as reasonable tenders can be obtained. Owing to the high tenders submitted last year the work was postponed until this season. The postponement of alterations at Wellesley school is also attributable to the same cause.

City Engineer Rust has recommended the construction of new asphalt pavements at an approximate cost of \$70,000.

Knox College trustees will shortly submit a programme to builders and contractors in reference to their proposed new building.

The Parks and Exhibition Committee are considering a proposal to construct a street car line across the Bathurst street through the Old Fort property to the Exhibition grounds. The scheme involves the enlargement of Bathurst street bridge and the erection of a smaller steel bridge over the C. P. R. tracks.

A. Berg & Sons, manufacturers of brickmaking machinery, have purchased the extensive engine works of the Canadian Shipbuilding Company, Limited, corner of Niagara and Bathurst streets. The business is to be considerably extended and new buildings will be erected.

Recent building permits include: M. S. Thompson, 6 attached 2-storey brick stores and dwellings, Bloor street, \$18,000; James Morrison Brass Manufacturing Company, 4-storey brick warehouse, Adelaide street West, \$60,000; D. McCurdy, 2-storey brick dwelling, Rusholme road, \$2,500; W. Williamson, alterations to planing mill, Woodbine avenue, \$4,000; Geo. H. Hees, addition to warehouse, corner Bay and Piper, \$2,500; Samuel Orenstein, 2-storey brick veneered front and rough cast dwelling, Bartlett avenue, \$1,200; W. O. Mathews, 2-storey rough cast dwelling, Broad-

view avenue, \$1,200; Ontario Jockey Club, 2-storey frame jockey room, Woodbine race track, \$3,850; J. V. Denicke, 2-storey and attic brick veneered front and rough cast dwelling, Ossington avenue, \$1,500; W. J. Hodgson, 2-storey brick store and dwelling, corner Christie and Dupont streets, \$3,550; Daniel Caster, 1 pair 2-storey semi-detached brick dwellings, Burnfield avenue, \$4,000; Colonial Loan & Investment Company, alterations to offices and stores, King street, \$7,000; M. Healey, 2-storey brick dwelling, Prince Arthur avenue, \$4,000; W. H. Joselin, 2-storey brick dwelling, Simpson avenue, \$3,000; Chas. Bankham, 2-storey brick veneered front and rough cast dwelling, Dovercourt road, \$2,000.

Vancouver, B.C.

A recommendation has been passed by the school board urging the install of the hot air and fan system for the better heating and ventilation of the city schools in general.

The grading recently commenced by the Great Northern Railway Company on the south shore of False Creek is said to be preliminary to the construction of important terminal works at this point.

W. E. Simpson, of Iowa Falls, Iowa, and other American associates, organized as the North American Timber Company, have acquired large timber holdings on the island and elsewhere on the coast, and will enter upon the construction of a large saw mill this season at Kennedy lake.

Application will shortly be made to charter a company who propose to build tram lines in the new suburb of Point Grey. Work will be commenced immediately after a charter is secured. It is stated that a steam plant will probably be installed.

At a recent meeting of the Board of Trade, the matter of dredging the Narrows came in for a lengthy discussion, with the result that the members passed a resolution urging the immediate construction of the necessary improvements.

Chief Carlyle, of the Fire Department, is asking for considerable extensions for the present year. The improvements submitted are as follows: fire boat for harbor service, estimated cost \$60,000; erection of new fire hall at Grandview; purchase of chemical engines for halls No. 3 and 5, and the annual purchase of five thousand feet of hose.

The police commissioners have approved the plans of chief Chamberlain calling for the erection of a separate jail for the chain gang and the matter will be taken up by the city council.

The British Canadian Wood, Pulp and Paper Company, Limited, are preparing plans for the erection of their mammoth plant at Howe Sound, twenty-five miles from this city. Charles B. Pride, of Appleton, Wis., is the architect and engineer.

A two-storey addition is to be constructed at the Salvation Army hostel on Gore avenue; estimated cost \$2,000.

The Seamen's Institute will erect a new building to cost \$3,000.

The B. C. Electric Railway Company will extend their double track on Granville street a distance of 1,500 feet.

Recent building permits include:— T. Allan, tenement house, Princess street, \$16,000; David Day, brick dye works, Pender street, \$3,000; C. N. James, frame dwelling, Twelfth street, \$1,500; C. W. Ford, Gilford street, frame dwelling, \$8,500; A. J. Hailey, frame tenement, Albert street, \$1,000; H. Hoffmeister, frame apartment store, Seymour street, \$4,500; John Macmillan, frame house, Laurel street \$1,250; Edson Brown, frame cottage, Lorne street, \$1,000.

Victoria, B. C.

A permit has been obtained by St. John's church for a new Sunday school on Herald street to cost \$3,800.

An amalgamation has been effected by the local University school and Queen's school, Vancouver, which latter will remove to this city. A large new college will be constructed in this connection later in the season.

Westville, N. S.

Tenders will be received by E. F. Jarvis, Secretary, Department of Militia and Defence, up to January 24th for the construction of a rifle range at this town. Specifications at offices of Commanding Officer, Halifax, N. S., at office of Lieutenant McKenzie, this town, and from the Director of Engineering Services, Militia Headquarters, Ottawa.

Winnipeg, Man.

The C.P.R. have come to an arrangement with the city concerning sewerage for their new shops, the company agreeing to pay \$24,000 for the necessary work.

White Point, N.S.

Tenders are invited by Fred Gélinas, Secretary, Department of Public Works, Ottawa, up to February 8th for the construction of a breakwater at this place. Specifications may be seen on application to the local postmaster; to E. G. Millidge, resident engineer, Antigonish, N.S.; C. E. W. Dodwell, resident engineer Halifax, N.S., and at the department, Ottawa.

CONTRACTS AWARDED.

Guelph, Ont.

The Smart-Turner Machine Company, Limited, of Hamilton, Ont., have a contract from the waterworks for the installation of a duplex boiler feed pump.

Lethbridge, Alta.

The Massey Harris Company have awarded a contract for the erection of a large frame transfer warehouse, 64 feet by 42 feet, two storeys and basement, to the Rogers-Cunningham Lumber Company.

Montreal, Que.

The C. P. R. have closed a contract with the Dominion Company for 400 composite steel and wood freight and ballast cars. The Nova Scotia Steel Company, of New Glasgow, N.S., will supply the steel work.

New Westminster, B.C.

W. D. Purdy, this city, has received the contract for the addition to the market at \$978.

Revelstoke, B.C.

T. F. Sinclair, of Vancouver, has obtained a contract amounting to \$50,000 in connection with the sewerage system being installed by this city.

Toronto, Ont.

The Board of Control have awarded the following contracts in connection with the new public bath house on Stephanie Place: carpentry work, George Henry, \$6,233; masonry, Page & Company, \$16,392; plastering, Wm. Webster, \$1,010; roofing, A. B. Ormsby & Company, \$1,398; glass tile work, Brooks, Sandford Company, \$480; painting, Faircloth & Company, \$570.

Brown & Love, of this city, are the successful tenderers for the new observatory to be erected corner of Bloor and Devonshire streets at an estimated cost of \$90,000.

Vancouver, B.C.

The Canadian Pipe Company, Limited, of Vancouver, have just received the contract for the supply and installation of 24,000 feet of 30 inch and 36 inch continuous wood stave pipe for the city water works plant at Seymour Creek. The work is to be completed by the middle of July next.

FIRES.

Hotel building of B. A. See, Nokomis, Sask.; loss \$13,000.

Buildings of Brandon Asylum, Brandon, Man.; loss \$10,000.

Buildings of Hippodrome theatre, C. McDermot and A. J. Gilmour, St. Catherines, Ont.; loss \$3,000.

Stables of Cavanah House, Peterborough, Ont.; building loss \$2,000.

Premises of Hallonquist and Jackson, Carlyle, Sask.; building loss \$3,500.

Store building of H. Thomas, Montreal, Que.; building loss \$1,000.

Buildings of St. Anne's Convent, St. Remi, Que.; loss \$50,000.

Buildings of Newcombe & Young, and Richard Code, Alvinston, Ont.; loss \$21,000.

Cold storage buildings of J. B. Hambridge, and House & Newell, Aylmer, Ont.; loss \$10,000.

Elevator building of W. G. Lee, Souris, Man.; loss \$9,000.

Buildings of C. R. Bronsdon and Rae & Donnelly, Montreal, Que.; building loss about \$7,000.

Barns of Street Railway Company, Hamilton, Ont.; loss \$30,000.

NEW COMPANIES.

Lewis Varnish Company, Limited, Toronto, Ont., incorporated, capital \$10,000. Incorporators, H. F. Lewis, G. M. Reynolds, W. H. Hunter and W. W. Dunlop, all of Toronto.

Lakes Lumbering, Limited, Toronto, Ont., incorporated, capital \$40,000. Incorporators, G. F. MacDonnell, R. H. Temple, G. Ruel and N. L. Harvey, all of Toronto, Ont.

Metropolitan Manufacturing Company, Limited, Toronto, Ont., incorporated, capital \$50,000. Incorporators, H. E. Gibbs, of Detroit, Mich., W. H. Grant, of Toronto, Ont., and others.

J. Barsalon & Company, Limited, Montreal, Que., incorporated as soap manufacturers, capital \$175,000. Incorporators, J. E. Gravel, H. Barsalon, J. L. Cowan, all of Montreal, and others.

Northern Foundry and Machine Company, Limited, Sault St. Marie, Ont., incorporated, capital \$50,000. Incorporators, J. N. Kendall, J. N. Neil, P. Young and A. U. Smeader, all of Sault St. Marie.

Falls City Lumber Company, Limited, Niagara Falls, Ont., incorporated, capital \$40,000. Incorporators, Alexander Mennie, of St. Mary's Ont., R. P. Slater and John Wilson, of Niagara Falls, Ont., and others.

Stoney Point Canning Company, Limited, Stoney Point, Ont., incorporated capital \$40,000. Incorporators, Joseph Breault, of Tecumseh, Ont., E. Desmarais, of Stoney Point, Ont., and others.

Dominion Equipment Supply Company, Limited, Winnipeg, Man., incorporated as timber and hardware merchants, and dealers in contractors'

and railway supplies, capital \$100,000. Incorporators, D. F. Coyle, R. H. Hyland, E. R. Dowdall and J. A. Coyle, all of Winnipeg.

Brazeau-McLeod Bituminous Coal Company, Limited, Quebec, Que., incorporated, capital \$250,000. Incorporators, L. Durand and A. De Bernis, of Millarville, Alta., Raymond Brutinel, of Edmonton, Alta., J. A. Metayer of Quebec, P. Q., and others.

BUSINESS NOTES.

All persons having any claim against the British Columbia General Contract Company, Limited, are asked to send in a full statement to the liquidators, J. Kendall and F. C. Sewell, Vancouver, by the end of the month.

Tremblay and Bergeron, plumbers, Montreal, Que., have dissolved partnership.

La Compagnie de Construction, Montreal, Que., are also reported to have dissolved.

The London Lumber Company, London, Ont., have disposed of their business to F. E. Harley.

Therrien and Gareau, lumber dealers, Montreal, Que., have dissolved and the business will henceforth be conducted by Julien Therrien.

It is reported that the Mount Engineering & Electric Contractors, Montreal, Que., have dissolved.

A new Montreal contracting firm, Jones & Glassco, have registered.

The Montreal Light, Heat and Power Company announce a dividend of one and a half per cent for the quarter ending January 31st, 1908, this being of course at the rate of six per cent per annum.

Newman and Topham, plumbers, Toronto Junction, Ont., have assigned; creditors meet 16th inst.

A. Desjardins & Company, plasterers, Montreal, Que., have registered.

The lands, plant, machinery and electric power plant of the Raven Lake Portland Cement Company will be offered for sale at noon on January 25th at the auction rooms of C. J. Townsend & Company, 68 King St. East, Toronto.

The creditors of H. R. Richey Company, Limited, plumbers, Montreal, Que., meet on the 27th inst.

W. N. Lusty has disposed of his sawmill at Rodney, Ont., to F. McCallum.

BUILDING NEWS.

The Maple Leaf flour mill at Kenora, Ont., destroyed by fire a few days ago, was 55 by 105 feet, and six storeys high, surmounted by a cupola. The

plans were prepared by Nordyke & Marion, of Indianapolis, and tenders were called in 1906, the contract being awarded to G. H. Archibald & Co., of Winnipeg, for \$168,000, and the machinery contract to Nordyke & Marion for \$47,000. While the mill would have held a plant to turn out 5,000 barrels daily, only half that capacity has been exercised. Throughout the mill the machinery was of the latest and most approved type. The town of Kenora will suffer a great loss as many of the citizens hold shares in the concern. At the council meeting a week or so ago the milling company offered to loan the town \$25,000 to help clear off part of the debt on the power station, and the loan was accepted. The town will probably lose the opportunity as well as suffer by the loss of the rent for power to the mill amounting to \$20,000 a year. The cupola of the mill was of solid brick resting on concrete foundation.

The waterworks report just issued by the city engineer of St. Thomas must be exceedingly gratifying to that city. That enterprise has its own reward is evidenced by the figures, which show a saving in coal of 33 per cent, brought about by the installation of new machinery. For the past year the system has produced a surplus of nearly \$8,000.

An investigation is being conducted in regard to the claims of W. J. Haney, of Toronto, who was the contractor for the bridge across the Hillsborough river, P. E. I., built at a cost of no less than \$1,500,000. Mr. Haney claims that \$300,000 is still coming to him for extras. Collingwood Schreiber has been appointed sole arbitrator.

It is claimed by the management of the new Pantages theatre, Vancouver, B. C. that their new building is the finest playhouse west of Chicago. This is a long cry but we are much inclined to think that it could be sustained. The call of our great west is no longer provincial, it is rapidly becoming universal, and when we hear of big business blocks being put up out there at a cost of hundreds of thousands of dollars, and Government buildings projected at a cost of a cool half million, and paving and drainage schemes for the present year involving a million, and bridge projects calling for an even greater amount, the most incredulous of us cannot but be brought to acknowledge that this great West of ours is no speculative vision but a living reality, with a great destiny that most of us will be privileged to see partly worked out. Reverting to the playhouse, however, this theatre which is now ready for occupancy, represents an outlay of

nearly \$100,000 and is said to be as beautifully fitted and well arranged as any similar house on the Pacific coast. In the auditorium there is room to seat 1246 people and every seat is so placed that a perfect view of the entire stage may be had. The stage measures 30 feet wide and is 38 feet in depth. Not the least important feature of the new theatre is the manner in which the exits and ventilating apparatus are arranged. There are twelve different places from which an audience can find egress to the streets, and it is said that 1,200 people can be let out of the house within two minutes. At both ends of the auditorium there have been placed large ventilating areas and along the sides of the theatre are air vents that will furnish an abundance of fresh ozone at all times. The place is to be heated by steam radiators. The entire theatre is decorated in wine color with buff and gold trimmings and presents a most inviting appearance. The beautifully decorated boxes, four in number, are so located that occupants may have a splendid view of the stage and yet not interfere with the view of the balance of the house. The scenery was especially painted for the Pantages, and altogether the building is a credit to Vancouver and to the enterprise of its citizens.

An Edmonton report states that construction of the second of the two largest piers in the world for sub-structure of the G. T. P. bridge across the north Saskatchewan river at Clover Bar has just been completed. The pier cost approximately \$52,000, and contains about 4,000 cubic yards of concrete. The largest pier in the world was the first pier of this bridge completed last May. These immense supports extend upwards for 92 feet from the river bed and the bottom of the pier is 32 feet below the river bed. About 350 men are employed on the G. T. P. bridge and the work of completing the sub-structure is being pushed forward as rapidly as possible. There still remain two large piers to be completed. Without any serious drawbacks one should be completed in about 3 weeks, and the other in eight weeks. Twenty smaller piers have all been completed, and all the forces of the company are bent upon completing these two large piers. The sub-structure of the bridge will be completed by the middle of March. The steel will probably be brought to Edmonton on some other line of railway and taken out to Clover Bar bridge on the G. T. P. which will be built early in the spring. In this way the bridge will be ready for traffic and will not delay the completion of the G. T. P. to Edmonton next summer.

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 and specifications of the work can be seen on and after the 1st 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.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,

Secretary.

Department of Railways and Canals.
Ottawa, January 16th, 1908.

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

Notice to Contractors

The Water & Light Commission of Aylmer, Ontario, will receive tenders for the construction of a 12 in. glazed tile water conduit, about 20,400 feet in length. Tenders will be received up till January 25th work to begin as soon as possible on acceptance of tender.

Plans and specifications can be seen at the office of the Secretary, Aylmer. A certified cheque for \$300.00 to accompany tender, which will be returned at once if tender not accepted. The lowest or any tender not necessarily accepted.

D. C. DAVIS, Secretary.

ONE ROOF COVERS ALL.

Tacoma must be given credit for a wonderful combination of enterprises under one roof — a hotel, office and mercantile structure, cold storage, freight warehouse and terminal station for both rail and water, all contained within 24 storeys, 200 x 400, covering 50 acres of floor space, and involving a total cost of \$6,000,000, says Chicago Construction News. In so far as the records show, this is in excess in point of cost of any single building erected at one time by private enterprise in this country. It shows what a combination of enterprise and effort can do, and reflects much credit upon that city. The structure will be built into a bluff, and will have fourteen storeys below ground at one end, and with a ground

SEALED TENDERS

Will be received by Wm. Lane, Clerk Huron County, Goderich P.O., Ont., where plans may be seen, until TUESDAY, THE 28th DAY OF JANUARY, 1908, at 2 P. M. for the erection of the superstructure of a Steel Bridge to be erected over the north branch of the Maitland river on Josephine street in the Town of Wingham, Huron County. The bridge is to be one span 140 feet floor, 16 ft. wide, sidewalk 6 feet wide, Lattice or gas pipe rail on bridge concrete floor, 1 part cement to 3 parts gravel. To be completed on or before the 15th day of September, 1908.

Tenders must be accompanied by marked cheque equal to 10 per cent of contract price and payable to Treasurer of Huron County.

The deposits of unsuccessful tenderers will be returned. No tender necessarily accepted.

Also a 103 ft. span Pratt truss pin or riveted concrete floor 14 ft. wide.

D. PATTERSON,
County Commissioner,
Huron County.

TENDERS

Office Commissioner, Public
Works and Mines

Department Technical Education,
Halifax, Nova Scotia.

Sealed tenders, marked "Tenders for Technical College" will be received at office of undersigned up to noon on MONDAY, FEBRUARY 17, 1908, for the erection of the

Nova Scotia Technical College,
in the city of Halifax.

Plans and Specifications can be seen at the office of Herbert E. Gates, Architect, Roy Building, Halifax, N.S. Each Tender must be accompanied by a Certified Cheque for 10% of the total amount of the Tender, as security for the performance of any contract entered into with the Department.

The Commissioner is not bound to accept any Tender.

C. P. CHISHOLM,
Commissioner Public Works & Mines.

United Counties of Prescott and Russell.

Tenders for Iron Highway Bridge

Sealed tenders addressed to the undersigned will be received up to 12 o'clock NOON of TUESDAY, the 21ST DAY OF JANUARY NEXT, A. D. 1908 for the construction of an iron highway bridge over the Big Castor River, 120 to 125 feet span. State price for each and also for removing the old 80 to 1 span, now in use, to the site of the new bridge over the Little Castor, about one mile distant, and place the same on the new abutments ready for public use.

Tenders are also asked for the masonry work required for the Big Castor bridge, concrete or st. ne. Information may be obtained from the undersigned by letter or in person, who will visit the locality with those tendering if required.

The lowest or any tender not necessarily accepted.

By order of Council.

E. ABBOT JOHNSON,
County Clerk,

Prescott and Russell.

L'Original,

Ont.

L'Original, December 16th, 1907.

Notice to Contractors

Tenders will be received until noon, the 7th day of February, 1908 for building a brick schoolhouse at Fairbank. Plans and specifications at Fairbank postoffice. Wm. Brimacombe, secretary, Wychwood Park,

level entrance at the other. The main structure will have a viaduct 600 feet long, extending from the bluff to the waters of Puget Sound, the full length being 1,000 feet. It will be built over two street, leaving tunnels for the thoroughfare, and will face a third street. From the viaduct piers machinery will unload the largest ocean-going steamers in one-third the time it can be done in any port in the world. Movable belts will convey the freight to the building, into great wholesale houses, and cold storage plants, which will occupy the lower fourteen floors.

Freight cars will enter on the first floor and be conveyed up six storeys on great elevators to be loaded or unloaded. The lower storeys will also be equipped with power for manu-

facturing plants. The upper ten storeys will be used for offices on the water front end, with a great hotel on the other. Space will be reserved in the structure for a union railway and marine depot for passengers. The construction will be steel and brick, and the structure will be called the Imperial Building. It will be in the heart of the city, one block from the city hall. In no other place in the world could such a combination for marine and freight terminals, together with retail and wholesale business locations, be found. Another \$6,000,000 corporations, known as the Pacific Subway and Terminal Company, has been organized to tunnel the city for the purpose of transferring the passenger and freight business on all railroads to the big building.

THE CORROSION OF STEEL AND IRON PIPE.

For some time experiments have been conducted at the National Tube Works, Pittsburg, Pa., with the object of increasing the life of pipe steel. A process has been developed which, after a year's trial, has given very encouraging results. Tests of this new steel have been made in sulphurous air, fresh water, salt water, and in mine water. So far, in every case the steel has proved itself much more uniform and less liable to pit than wrought iron. The latter is a very important advantage, a pit being analogous to the weak link of a chain.

Some tests were made of this steel in comparison with various makes of "strictly wrought iron" pipe by coal mining companies in different parts of the country. Samples cut from separate lengths were placed in a wooden crate, so that they would be subjected inside and out to the action of running "sulphur" water from

the mine. In some of the tests undertaken the corrosion was allowed to proceed until the steel pipe began to give way. The steel pipe was decidedly freer from pits in all these tests.

Recent tests which Prof. H. M. Howe has conducted on modern pipe steel compared with standard grades of wrought iron in hot aerated brine, have shown the steel to be practically free from pitting, and on the whole to have at least equally good resisting qualities under conditions where steel formerly lost about 18 per cent. more weight than wrought iron. Numerous tests made in aerated brine in the National Tube Company's laboratory have given practically the same results.

JOHN S. FIELDING

C. E.

CONSULTING ENGINEER

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Power

BRIDGES

MACHINERY

Plants

Hydraulics

25 Years' Experience

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THE PRIESTMAN EXCAVATOR AND DREDGER

is used throughout the world. Will do more work with less labor, at a less first cost than any Excavator at present in use in Canada. For particulars write

G. P. WALLINGTON,

Canadian Representative,

11 Front Street East, Toronto

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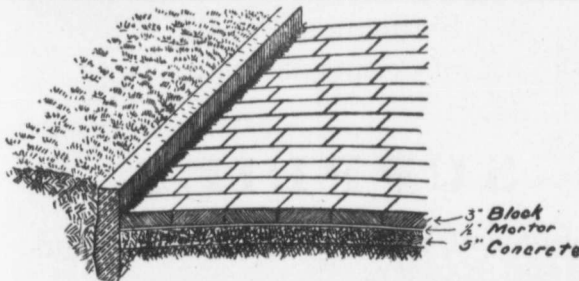
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THE FINISH OF CONCRETE SURFACES.

(Continued from Page 17.)

This finish gives a lighter surface than troweling, fills any pores that may be in the cement coating, and economically as picking.

Air Blast.—When the Aberthaw Construction Company built the Stadium at Harvard, they tried, under Professor Johnson's direction, the dressing of the surface with air blast. The men employed had no experience in this work, but the experiment proved that the surface could be dressed this way and bring out the color of the stone underneath. Mr. Tuttle has no data as to the cost of this, but be-

lieves it to be a little more expensive than picking.

Hammered Surface.—With a stone hammer concrete made with a fine aggregate can be dressed to a good surface. The Transit Commission have used this in some of their exits and are using it now on parts of the Washington street tunnel. With an eight-blade hammer it is necessary to have fine aggregate near the surface, as the hammer will not dress down through the end of a large stone which appears on the surface. A laborer with an eight-cut hammer working on the exit near the Old South about 25 square feet of surface per day. For fine detail work and for fin-

ished concrete block, and necessarily for imitations of natural stones, this form of dressing is used and is quite successful and satisfactory. It is more expensive than picking.

Acid Treatment.—It has been found that by applying dilute sulphuric acid to concrete surfaces and rubbing this with a steel brush, the cement can be dissolved away from the particles of aggregate and the color brought out very prettily. A United States patent was taken out to cover this process. Mr. Tuttle could not state how far this patent covers the matter.

Plastered Surface.—It has seemed to Mr. Tuttle that in the future con-



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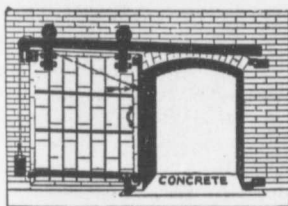
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crete construction will be built more to standards as to size of columns, depth and thickness of beams, and that this will necessitate the use of plastering and modeling in order to bring a building to its desired form. It would seem that the present methods of building forms so accurately that the concrete shall assume its final shape in them is too expensive, and that eventually this work may be done more roughly and the surface brought up with an application of plaster or some other means of finishing. The cost of handling the concrete forms to exact masonry lines is very great. It is not exceptional to have the centering of the two sides of a plain wall cost 15 cents a square foot of wall surface or 7 1-2 cents for each side. This cost can be much reduced if the work is not done so accurately.

A cheap method of finishing wall surfaces is to mix small pebbles with mortar and throw these at the wall. If the surface is kept free from freezing or from too quick drying out, they will adhere and make a rough, pleasing surface.

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**DETAILS OF EDISON'S CONCRETE
HOUSE.**

For the following information regarding the process of construction of Edison's concrete houses we are indebted to a recent issue of the "Scientific American."

The method consists in the use of moulds, costing 25,000 dollars the set, made of 3-4 inch cast iron, planed, nickel plated, and polished. The different pieces vary in size, some of the interior parts being but 2 feet square. When in position, the units are held in place by trusses and dowel pins. Into the top of these moulds concrete is pumped continuously by compressed air, using two cylinders. The concrete itself acts as a piston, and the two cylinders are alternately filled and emptied. The delivery of the mixture must be continuous, for wherever it is stopped a line appears. To secure this rapid and continuous flow, at the rate of 175 cubic yards per day, a very efficient mixer is required. It has not yet been decided whether a Ransome or a specially designed machine will be used. No rubbing up is necessary, although a few flaws may be present, owing to the difficulty of expelling all air. The escape of air is permitted by the special design of the house, or, when necessary, by a temporary pipe, which may be removed later.

The concrete used is mixed according to the ordinary proportions of one part of cement high in lime, three parts of sand and five parts of crushed stone. The cement is so finely ground that it readily takes up the requisite quantity of water to make it flow. Another result of the fine grinding, to which the possibility of reproducing minute details is due, is the absolute water-tightness of this material, since there are none of the inter-granular openings that are present when coarse ingredients are used. Great strength is assured at the points of stress by wire reinforcements set in the body of the material.

Bath tubs and similar fixtures will be cast in place. Pipes for the steam heat, conduits for the electric wiring, and the iron tubing through which the lead pipes for the plumbing are to be afterward drawn, are all set in the moulds before the cement is run

in. The only wood present will be the doors, window sashes, and perhaps a few strips to which to attach carpents.

The first house of this kind is to be built in the style of Francois I. It will have a cellar and three storeys, with nine rooms. The walls are to be 12, 10 and 6 inches thick in the various parts. The interior will be handsomely ornamented, making no further decoration work necessary after the moulds are removed. If it is desired to heighten the inside effect, tinting can be resorted to. In addition to the enrichments, all of these dwellings will have elaborate chimney pieces. The roof imitates tiling, and can be painted to suit the owner's taste.

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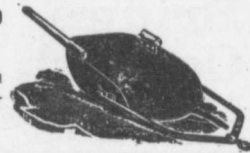
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side cold, but one-quarter the coal ordinarily required is needed to heat these dwellings. By keeping the doors and windows closed, they can be kept correspondingly cool in summer. This manner of building, it is admitted, is not economical for putting up single houses, owing to the cost of the initial outlay, although this outlay is in the nature of a permanent investment, as the plant is practically indestructible. On the other hand, for constructing, say, a thousand houses, in proximity to each other, it is claimed to be very suitable.

According to Mr. Edison, the actual cost of a dwelling made according to this method would be \$1,000. The wear and tear on the moulds, and the interest on the outlay, he figures at about \$50 a house. This makes the total cost \$1,050.

The architects who have designed the house for Mr. Edison are Messrs. Manning and Macneille.

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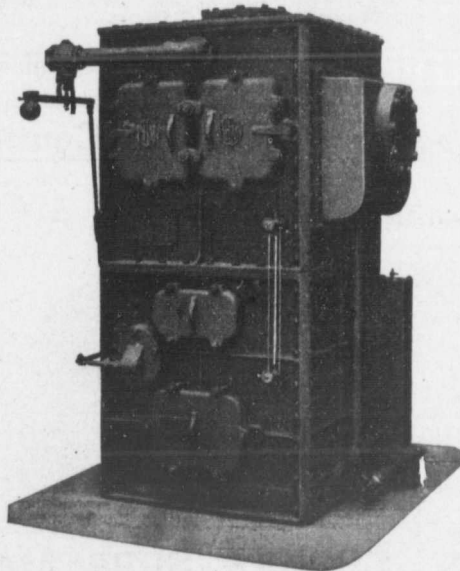
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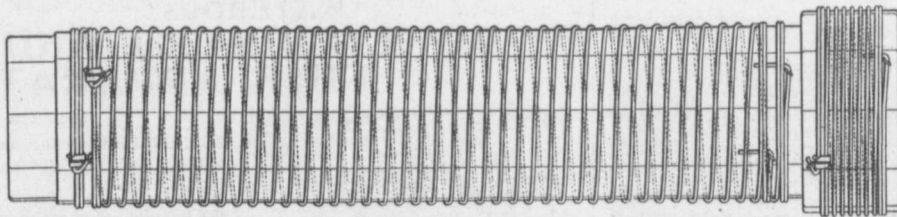
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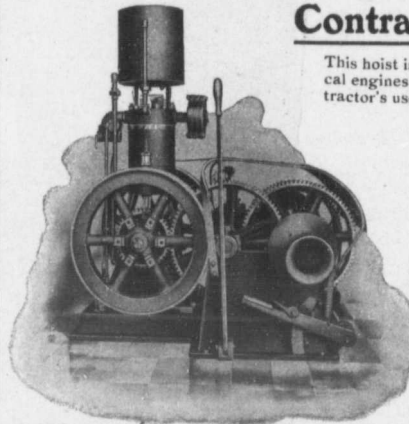
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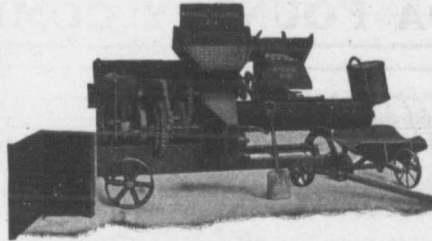
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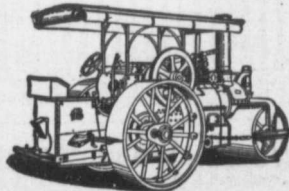
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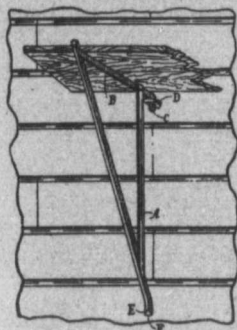
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