to prepare plans for the new ten-roomed Separate school to be erected on Bond street, a site for which has been granted by the Archbishop. It will be situated between St. Michaels' Cathedral and Loretto convent.—F. B. Watson, architect, 36 Toronto street, will receive tenders until to-day (Saturday) for the erection of a pair of semi-detached brick and stone dwellings.—Mr. H. A. Massey has made a proposition to donate the sum of $100,000 towards the erection of a large music hall, providing the city would guarantee the cost of maintenance. A site has been purchased at the corner of Victoria and Shuter streets, on which it is expected a fine building will be erected.—A deputation from Huntsville, Muskoka, interviewed the Commissioner of Public Works for Ontario recently asking for a canal and slide between Lake of Bays and Peninsula lake, a distance of three quarters of a mile. The cost is estimated at $40,000.—The site is being prepared for the new buildings to be erected on Yorkville avenue by the Toronto Street Railway Company. The work of erection will be commenced in the spring.—The old Presbyterian church on Charles street is being pulled down, and a number of residences will be erected on the site thereof.—The Street Railway Company have stated their intention of having all the lines operated by electricity next year. This will necessitate the paving of some 30 miles of track, at a cost of $300,000. —On the 29th inst., the ratepayers will vote on a by-law to provide for the issue of debentures to the amount of $57,600, for the purchase of sites and erection of school buildings.—Mr. R. Lamb has purchased the property on the north-east corner of York and Wellington streets upon which stands the residence until recently occupied by Dr. Thornburn. It is expected that new buildings will be erected thereon.—Building permits have been granted as follows: Mrs. Clarke and Mrs. Cuttle, 71 Sully street, pr. s. d. two story and attic bk. dwellings, w side Beatrice street near Arthur street, cost $6,000 W D. Hird, pr. one story mansard b. f. dwellings, n. side Reid street., cost $1,000, Western Manufacturing Co., large 1 story brick factory, s. side King street at subway, cost $18,000.

FIRES.

The residence of Peter Duncan, near Brigden, Ontario, was destroyed by fire on Tuesday last. The loss is estimated at $2,000, which is partly covered by insurance.—Fremaine's planing mill and sash factory, corner Papineau road and Rachel street, Montreal, was damaged by fire to the extent of $4,000.—Ogilvie's large grain elevator at Virden, Man., was burned on the 5th inst., with all its contents.—G. R. Perry's block at Simcoe, Ont., was totally destroyed by fire on the 3rd inst., entailing a loss of $20,000, insurance, $14,000. -The Jewish synagogue at Winnipeg, Man., has been totally destroyed by fire.

CONTRACTS AWARDED.

BLYTHE, ONT.—Messrs T Kelly & Son have been awarded the contract for lighting the streets with electric light

MOOSEJAW, N. W. T.—Mr. John Simmons, of Regina, has been awarded the contract for building the new court house in this town.

MONTREAL, QUE.—The Harbor Commissioners have accepted the tender of Mr R. McIntyre of Calumet for the supply of 340 000 feet of hem lock plank required for next season's work.

NEW WESTMINSTER, B. C.—The Maple Ridge Dyking Commissioners have awarded the contract for dyking 9,000 acres of land, to T. W. Patterson, of Victoria. The contract price is between $50,000 and $60,000.

MAGOG, QUE.—Messrs. A. H. Moore & Co. have been awarded the contract for the D C M. Company's new warehouse and are preparing the site for the same. The same firm have also received the contract for the erection of a new terrace for the company, and will begin operations in the spring.

LONDON, ONT.—The following are the successful contractors for the erection of the pork-packing establishment for an English firm, represented by Messrs. Webb and Genge: masonry, Joshua Garratt; carpentry, Wright & Durand; iron work, Mr. Stevely; plumbing, Mr Dennis. The total cost will be in the neighborhood of $30,000.

BEAMS AND GIRDERS.

It is often necessary to decide quickly what sort of girder or beam shall be used over a bay window or shop front, or across any wide span. Too many architects neglect to calculate the required strength, and so fail in some cases to economize materials. To ascertain the required strength, we should first estimate the amount of walling, whether brick or stone, which the beam will have to carry. Remembering that when the load is evenly distributed the beam will carry twice as much as when it is concentrated in the middle, we shall guard against taking the amount of walling, deducting the window openings, and then regarding the net amount of walling as an evenly distributed load. When there is a central pier between the windows, it is obvious that a large proportion of the weight comes upon the centre of the beam, and ought to be provided for. A safe and sufficiently accurate plan is to regard such a pier as being concentrated upon the centre of the beam, and to take all the rest of the walling as an evenly distributed load. A rough estimate of the weight will do, and whether the walling is of brick or stone it may be calculated as 1 cwt. per cubic foot.

Next we have to consider what the beam will carry besides the walling which rests upon it. It will have to carry its share of any floor whose joists take their bearing upon the beamit self or upon the wall when it carries. Half the entire load upon any such floor will be carried as a distributed load upon the beam. For the weights per square foot which floors should be calculated to sustain, including the weight, in each case, of the floor itself, Hurst's "Handbook" gives the following. Ordinary dwelling-house floors, 1¼ cwt.; public buildings, etc., 1½ cwt.; and warehouses, factories, etc., 2½ cwt. to 4 cwt. Now in the opinion of some experienced architects, these weights are excessive; however, it should be rememeberd that the weights upon a floor are partly moving weights, and produce more strain than the same weights would if stationary. Viewed in this light, the weights quoted above cannot, we think, be deemed excessive. Next we have to consider what roofing abuts upon the wall carried by the beam. We shall probably have a sloping surface of roof, one half of which is supported by a purlin or a ridge, while the other half rests upon the wall. The weight of this latter portion may be calculated at 40lb. per square foot, to include the weight of timbers and roofing, with all necessary allowance for occasional stress caused by weight of snow and high winds.

Having made these preliminary calculations, we have to decide what sort of beam will serve our purpose. Suppose we require a beam to carry a 13½ in. wall over a 10 ft. opening, the total distributed load upon the beam being six tons. Reckoning the safe load upon a beam at one-fifth of its breaking weight, we shall find by the usual calculation for fir, that three pieces 10 in. by 4 in. bolted together will exactly do the work. Giving each end of the beam a bearing of 1 ft. 3 in., and allowing for ¾ in. wrought-iron bolts, 14 in. long, and not less than 18 in. apart, we shall find that we have 10½ cubic feet of timber, and 10 bolts weighing, with their heads and nuts, 23 lbs. If the timber costs 2s. 3d. per foot cube, including delivery and fixing, and the bolts 1d. per pound, our beam would cost us 25s. 6½d. The same weight could be carried by two rolled iron H-joists, each 7 in. by 2¼ in., weighing 14 lb. per foot run, placed side by side, 6 in. from center to center. If these could be supplied and fixed at 8s. 6d. per cwt., they would cost, if the same length as the beam, 26s. 6d. There would have to be a cover-stone, which might be dispensed with in the case of a beam so that the latter would in this instance be preferable.

If we suppose the distributed load to be 12 instead of six tons, the same fir beam, in three sections bolted together as described, will do, with the addition of two ½ in. wrought-iron fitches in between the sections of the beam. These fitches should be 1 in. less deep than the beam, so that the timber may shrink a little without throwing the whole weight upon the iron, which would have a disastrous effect upon the brickwork. There would therefore be 18¾ ft. super of ½ in. iron plate, weighing 20¼ lb. per foot, which would amount to 3 cwt. 44 lb., and, if priced at 8s. per cwt., would cost about 27s. Then we have to allow for drilling 20 bolt holes, at, say, 4d. each—amounting to 6s. 8d.; so that the timber, fitches, and bolts complete, would cost £2. 19s. 2½d.—say, £3. The same weight could be carried by two 6 in. by 5 in. rolled joists, weighing 29 lb. per foot run each, and costing £2 15s. 4d., at 8s. 6d. per cwt.—*Contract Journal.*

CARPENTRY.

PARTITIONS.—In modern carpentry there is no part of a building so much neglected as the partitions. A square of partitioning is of considerable weight, seldom less than half a ton, and often much more, therefore a partition should have an adequate support; instead of which it is often suffered to rest on the floor, which, of course, settles under a weight it was never intended to bear, and the partition breaks from the ceiling above.

A partition should, if practicable, be supported by the walls with which it is connected, in order if the walls settle that it may settle with them. this would prevent the separation of the plastering at the angles of the room. For the same reason a firm connection with the ceiling is an important object in the construction of a partition

DESIGNING JOINTS. In designing joints the following principles, as laid down by Professor Rankine, should be considered:—

1. To cut the joints and arrange the fastenings so as to weaken the pieces of timber that they connect as little as possible.

It is through a knowledge of the composition and resolution of forces alone that the carpenter can expect to arrive at excellence in the art of designing frames of timber, for the purposes of building for machines and other uses, and without this knowledge it would be impossible for him to understand clearly what is to be aimed at in such designs or even to know if a design of his own would answer its intended purpose or not. The strength to resist a weight that will produce fracture is as the area of the section consequently, multiply the area of the section in inches by the weight that will tear asunder a bar an inch square of the same kind of wood, and the product will be the weight in pounds that the piece will just support. But the greatest constant load any piece should be allowed to sustain ought not to exceed one-fourth of this. The same rule applies to iron and to the cohesion of timber when it is pulled asunder at right angles to the direction of the fibers.

2. To place each abutting surface in a joint as nearly as possible perpendicular to the pressure which it has to transmit.

3. To proportion the area of each surface to the pressure which it has to bear so that the timber may be safe against injury under the heaviest load which occurs in practice, and to form and fit every pair of surfaces accurately, in order to distribute the stress uniformly.

4. To place the fastenings in each piece of timber so that there shall be sufficient resistance to the giving-way of the joints by the fastenings shearing or crushing their way through the timber.

SCARFS.—With respect to the length of scarfs, this will depend on the object in view, and force causing the fibers to slide upon each other must be considered by adopting a long table. The bolts may be increased in number, and the cohesive strength of a compound piece is not diminished, but the transverse is affected. For soft woods, as fir, a scarf of a length of about four times the depth of the timber has been recommended when there are indents and bolts, and for hard wood twice the depth if bolts are omitted. The scarfing may be twelve times for soft wood, and six times for hard wood.

MUNICIPAL DEPARTMENT.

LEGAL DECISIONS AFFECTING MUNICIPALITIES.

MASON V. TOWN OF PETERBORO.—Counsel for the defendants, moved for judgment of non suit subsequent to disagreement of the jury in an action for damages for injuries to plaintiff resulting from a fall caused by slipping on a sidewalk in the town of Peterboro'. The plaintiff alleged that the accident was caused by an inequality in the sidewalk, one board sloping from the level to the extent of from three-quarters of an inch to an inch and one-half as variously estimated. The defendants contended that such a degree of inequality could not be held sufficient to make them liable for negligence. Motion dismissed with costs.

VILLAGE OF NEW HAMBURG V. COUNTY OF WATERLOO. This was an appeal from the judgment of the Queen's Bench Divisional Court (22 O. R 195) reversing the judgment of Ferguson J. which was in favor of the plaintiffs, and dismissing the action, unless the plaintiffs elected to have a new trial. The action was brought for a mandamus to compel the defendants to repair a bridge over the river Nith in the village of New Hamburg. The plaintiffs contended that it was a bridge which the county corporation were bound to build and repair, as the river was over 100 feet in width. The court below held that the place at which the width of a stream is to be ascertained is the place at which the bridge crosses it: the width is to be determined by the width of the natural channel of the stream, taking it in its highest ordinary rate.

ELECTRICAL RAILWAYS IN SMALL TOWNS.

The stupendous growth of the modern street railway is often pointed out, so often in fact that investors are beginning to fear that the business of organizing companies for the purpose of building electric railways is almost being overdone. Nothing can be more important, in deciding beforehand the desirability of a street railway in a certain town, than a knowledge of about what proportion of that population are likely to be regular patrons of the intended road and how many passengers are needed per annum to make the investment pay.

The commercial benefits that a new street railway brings to a growing town are so well known as not to need mention, and the practical aspect settles itself into the question as to how small a town would be profited by the building of a street railway. In treating this it is necessary to know just what part of the population are likely to ride daily. The following figures, which have been carefully prepared, will show what past experience has proved. The average of nine towns with a population ranging from 3,500 to 18,000 shows that each person takes on an average 29 rides per annum. It has been estimated by such able engineers as Mr. Crosby that, in order to pay 5 per cent. on the investment, an electric car must earn an average of 15 cents per car-mile. At a fair rate of paying expenses this would require about 3 or 4 passengers per mile. With the low average of 110 miles per car per day about 400 passengers would thus be needed to make the road pay. If a population of a certain town be 12,000, according to the above figures 348,000 fares would be collected perannum, and this would support no more than 2