

**CONTRACTS OPEN.**

**GUELPH, ONT.**—A new bridge will be erected over the Conestoga river at Glen Allan.

**NORWOOD, ONT.**—The erection of new High School buildings is under consideration.

**SAINT LAMBERT, P. Q.**—An effort is being made to secure water-works and drainage.

**WINDSOR, ONT.**—Mr. Geo. Christie will erect a residence to cost about \$4,000 on Victoria ave.

**FORT WILLIAM, ONT.**—The Hudson Bay Company will erect a block of stores to cost \$26,000.

**LONDON, ONT.**—Mr. Geo. Craddock, architect, invites tenders until Monday, the 9th inst., for the erection of a house for W. H. Wortman.

**KINGSTON, ONT.**—Plans are being prepared for the rebuilding of the Congregational church, and tenders for the work will shortly be invited.

**HAMILTON, ONT.**—Local capitalists are considering the advisability of building a pipe line from Hamilton to the natural gas well at Welland, a distance of 40 miles.

**NEW WESTMINSTER, B. C.**—It is proposed to erect the largest and most costly business block in the province fronting on Columbia, McKenzie, Clarkson and Lorne Streets.

**ESSEX CENTRE, ONT.**—The ratepayers will vote on May 14th on a by-law to raise \$26,500 for the construction of water-works. The proposed plan includes a tube well and an elevated steel storage tank.

**WOODSTOCK, ONT.**—A representative of the Singer Sewing Machine Co. recently visited this and other towns in western Ontario with the view of selecting a suitable location for a wood-working factory which it is the intention of the company to build.

**QUEBEC, QUE.**—The Provincial Government has just purchased a site for a new prison building at Sault Au Recollet and a site in this city for a normal school. A number of handsome donations have been given towards the rebuilding of Bishop's College at Lennoxville.

**WINNIPEG, MAN.**—At the recent meeting held in this city to consider the prospect for erecting a masonic temple, a committee, composed of Messrs. Leslie, Akin, Westbrook, Miller and others was appointed to obtain information regarding plans, site, etc., and report to a meeting to be held shortly.

**W. TORONTO JUNCTION.**—Humberside ave. will be extended through to Dundas street and graded.—It is proposed to open Keele street north of St. Clair avenue by a subway under the railways, the cost to be shared by the companies, the town and York township.—Mr. Chas. Brewer, will build extensive additions to the Peacock Hotel.

**MONTREAL, QUE.**—The plans for the new High School have been practically approved by the special committee of the Protestant School Commissioners, and it is probable that building operations will be begun at an early date.—Plans have been prepared for the completion of the R. C. church at Hochelaga, at an estimated cost of \$50,000. Action has been postponed for a short time.

**PORT ARTHUR, ONT.**—Tenders are invited by the town clerk until the first day of April next, for supplying to the corporation the following materials. 273 tons of best steel rails, approved section, 40 lbs. per yard, drilled at each end for electric railway connections; fish plates, nuts, bolts and spikes, frogs and switches complete, for four and one-third miles of railway; one diamond crossing of approved make, for 4 ft. 8½ inch gauge and specified angle, also electric railway supplies, such as generator, motor, cars, wire, etc. Above goods to be delivered at Port Arthur on or before 1st of June.

**TORONTO, ONT.**—A notice of motion has been given in Council to instruct the Board of Works to prepare estimates and call for tenders for widening the Queen Street subway.—It is reported that Toronto parties contemplate the erection of a large hotel at the corner of Bloor and Dundas

streets.—The following building permits have been granted: C. D. Delworth, a story and attic bk. store and dwelling, w. side Bathurst st., near Dupont, cost \$3,000; John Spence, pr. a story and attic bk. dwellings, w. side McMurrich st., cost \$1900; Hodge & Bell, a story bk. additions to dwellings, cor. Argyle and Lisgar sts., cost \$2,000; John Blair, 3 story bk. store and dwelling, 436 Queen st. w., cost \$6,000; J. Fraser, four att. a story and attic bk. fronted dwellings and one store, cor. Broadview ave. and Close st., cost, \$10,000; Rich. White, pr. att. a story bk. dwellings, e. side Strachan ave., n. of King st., cost \$2,600; Fred. W. Lyons, a story bk. dwelling, e. side Strachan ave., north of King st., cost \$1,300.

**CONTRACTS AWARDED.**

**ALMONTE, ONT.**—Messrs. James Wilson and John McKechnie have been given the contract for the erection of the new Reformed Presbyterian Church.

**SILVERING GLASS.**

The London *Plumber and Decorator* recently published the following process: (1) Argentic nitrate is dissolved in distilled water, and ammonia is added to the solution till the precipitate first thrown down is almost entirely dissolved. The solution is filtered and diluted, so that 100 cc. contains one gramme of argentic nitrate. (2) Two grammes of argentic nitrate are dissolved in a little distilled water, and poured into a litre of boiling distilled water, 1.66 gramme of Rochelle salt is added and the mixture boiled for a short time, till the precipitate contained in it becomes gray; it is then filtered hot. The glass having been thoroughly cleaned with (1) nitric acid, (2) water, (3) caustic potash (4) water, (5) alcohol, and lastly distilled water, is to be placed in a clean glass or porcelain vessel, the side to be silvered being placed uppermost. Equal quantities of the two solutions are then to be mixed and poured in so as to cover the glass. This should be done while the glass is well wet with distilled water. In about an hour the silvering will be completed. Then pour off the exhausted liquid, carefully remove glass, wash it in clean water, rub off silver deposited where not allowed to dry. The time required for the operation depends on temperature. If the solutions be warmed to about 30 deg. C. the silver is deposited in a few minutes; but it is safer to use them cold.

To prevent the paint on iron or wood from scaling off when exposed to the weather, first thoroughly wash the parts to be painted and then brush over the surface with hot linseed oil. By following this method, especially with iron articles, no scaling of the paint will occur. In cases where the articles to be painted are small and can be readily heated, it is better to heat them and plunge them into the oil. The thin liquid oil when hot enters into the pores of the metal, absorbs the moisture, and the paint then applied so firmly adheres that frost, rain or air cannot effect a separation.

Experiments lately made on the strength of bent pipes have shown the strain on the inside of the angle, due to efforts of the pipes to straighten themselves under pressure, a problem regarded as one of considerable intricacy in engineering prac-

tice, resolvable, however, by computation. In one of these experiments a copper pipe of 6¼-inch bore and three-sixteenths of an inch thick was employed, the angle was ninety degrees, and the legs sixteen inches long from the center. At a pressure of 912 pounds to an inch, the deflection of the pipes was nearly three-eighths of an inch, showing an enormous strain on the inner side in addition to the pressure.

**THE STRENGTH OF BEAMS.\***

Laying the bar now in a horizontal position, and placing its ends upon a pair of supports, we will proceed to load it in the middle, so as to bend the bar downwards. In this bended beam, it is tolerably evident that the lower fibres are stretched, while the upper fibres are compressed, and somewhere in the middle of the bar the length of the fibres is unaltered.

It is known by careful experiment that the elastic stretching of the material is just in proportion to the stress you put upon it; and, starting from this well-ascertained law, mathematicians have gone on to calculate everything that ought to take place in the beam when it is bent in the manner that we are supposing. But we all know that calculations are sometimes liable to error; and if we test the results of this particular theory by actual experiment, we shall find a discrepancy which is so startling and paradoxical, that it can only be understood as revealing a new and unsuspected property of the material; and for that reason it may be interesting to glance at it.

Taking the steps of the theory in their natural order, it is first calculated that under a given load the beam ought to show a certain curvature; then that the topmost fibre ought to be shortened by so much; the lowest fibre ought to be elongated by a nearly equal quantity; the tensile stress in that fibre, or its direct pull, ought therefore to be so many tons per square inch; and lastly, arguing from the known tensile strength of the material under a direct pull, it is calculated that a load of so many tons placed on the beam ought to be just sufficient to break it by tearing the lower fibre. But if we now take a cast-iron beam of square section, and proceed to test each step of the calculation by direct experiment, we shall find the following remarkable results:—

The calculated curvature of the beam is found to be either quite correct or very nearly so—under this curvature the fibres of the beam are found to behave as they ought to do, the topmost fibre is duly shortened, and so far as can be ascertained by the most refined measurements the lowest fibre is pulled out to the full stretch indicated by theory—and yet, when we place the calculated breaking load upon the beam, the beam refuses to break; and as a matter of fact it will not give way until we have increased the load to more than double the calculated breaking weight.

The same discrepancy is observed in wrought iron and in steel, although not to so great an extent as in cast iron; and in the latter case its existence has never been satisfactorily explained. As the first steps in the calculation are proved by experiment to be correct, the natural inference seems to be that the calculated tensile

\*From a paper read by C. Claxton Fidler, C.E., at a meeting of the Society of Architects, Jan. 13th, 1891.