

proving the intake; \$64,000 for the reservoir; \$400,000 for filtration purposes; \$30,000 for new hydrants; \$10,000 for new water mains; and \$1,000 for water meters.—Vincent Lacombe, architect, is preparing plans for a factory for C. Gullibert & Sons, St. Catherine street east.—Building permits have been issued as follows: Mrs. A. Dupenault, three storey house, 116 University street, cost \$7,500, (architects, Bernier & Brodeur); Chanteloup Mfg. Co., three storey warehouse, Cote street, cost \$10,000.

TORONTO, ONT.—It is announced that the Canada Life Assurance Co., who practically own the Princess theatre building on King street west, have agreed with the lessee to spend several thousand dollars during the coming summer in improving the building.—The Canadian Order of Foresters are considering a proposition to purchase Richmond Hall as headquarters for the Order, in the event of which the building will be entirely remodelled.—The Consumers' Gas Co. have applied to the city for permission to build a bridge across Parliament street connecting their buildings.—The Medical Health Officer has recommended the construction of a small crematory on the island to dispose of the garbage.—The city will shortly advertise for tenders for the following works: Asphalt pavements—Huron street, Cecil to College; Leopold street, Jameson to Dowling; Farley, Bathurst to Tecumseh. Macadam roadways—Brock street, Dundas to 1,000 feet south of Bloor; St. Joseph street, St. Vincent to 700 feet west; Isabella street, Yonge to Jarvis. Cedar block pavement—Alma avenue, Gladstone to Dufferin. Wood curbing—Wellington place, Spadina to Portland; Esther street, Queen to St. Patrick; Eden place, Bathurst to East End. Brick pavement—Piper street, York to east end. Brick walk—Sherbourne street, east side, Ancroft to South Drive. Concrete walks—Harbord street, north side, Robert to Borden; Charles street, north side, Yonge to Church; McCaul street, west side, Grange to St. Patrick; McCaul street, east side, Caer Howell to College; Baldwin street, south side, Beverley to Huron; Selby street, north side, Sherbourne to Huntley; Gerard street, north side, Berkeley to Ontario; Melbourne avenue, south side, Dufferin to Cowan; Oxford street, south side, Spadina to Augusta; Clinton street, east side, College to Harbord; Elmgrove avenue, east side, King to Queen; Simcoe street, east side, Adelaide to 62 ft. south; Spadina place, west side, Cecil to 214 ft. south; Queen street, south side, Massey to 45 feet west of Strachan avenue; Queen street, north side, Lansdowne avenue to 82 feet east; Howard street, north side, Glen road to Sherbourne; King street, north side, Bathurst to Niagara; Gerrard street, south side, Parliament to Sumach; Elm street, north side, Yonge to Terauley; Huron street, east side, Prince Arthur to Lowther; Queen street, north side, Grant to De Grassi; Gerrard street, south side, Sherbourne to Seaton; Carlton street, north side, Parliament to Sackville; Dunbar road, west side, Elm avenue to South Drive; Front street, south side, Church to West Market; Hayden street, north side, Church to Yonge; St. Vincent, both sides, Grosvenor to St. Joseph; Grosvenor street, north side, Yonge to St. Vincent; St. George street, west side, Bloor to Prince Arthur; Rose avenue, west side, St. James to Howard; Lowther avenue, north side, Walmer road to Brunswick; Oxford street, north side, Spadina to Augusta; Queen street, north side, John to 101 feet west; John street, west side, Queen to Grange; Elm street, north side, Terauley to Centre avenue.—Building permits have been granted as follows: William Moss, pair brick dwellings on Arthur street, near Sully, cost \$3,800; P. Roche, brick addition, 325 Queen street

west, cost \$2,500.—Ald. McMurrich will move in Council that a special committee be appointed to wait upon the Minister of Militia and urge that extra accommodation for the militia be provided in the armories.

#### FIRES.

Residence of G. W. Mullin at Picton, Ont., partially destroyed.—Dwelling at Brighton, Ont., owned by Mrs. William Coyle.—Woolen mills of Peter Inglis at Inglis Falls, 3 miles south of Owen Sound, Ont., totally destroyed.—Warehouses of J. Fennel & Son, hardware merchants, and the Masonic hall at Berlin, Ont., almost totally destroyed; loss \$40,000.—The Providence convent at La Prairie, near Montreal, totally destroyed; loss \$100,000.—Plant of the Duncan Lithograph Co. at Hamilton, Ont.; loss \$15,000.—A disastrous fire occurred in the city of Montreal on the 23rd inst., by which the block bounded by St. Sacrament, Commissioner, St. Nicholas, and McGill streets was almost totally destroyed by fire, including the Board of Trade building. Among the losses are: Laporte, Martin & Co., M. Saxe & Co., H. A. Nelson & Co., Davidson Manufacturing Co., Corticelli Silk Co., Duclos & Loseley, Silverman & Bolter, Seybold, Son & Co., and others. It is estimated that the loss will reach \$3,000,000. A second fire occurred a few days later, by which the cheese warehouses of D. A. McPherson, W. Johnston and Nicholas Pitt on William street were destroyed, the loss being about \$250,000.

#### CONTRACTS AWARDED.

LEAMINGTON, ONT.—The contract for construction of dock here has been let to Mr. Fluke, of Chatham, for \$27,750.

LEVIS, QUE.—Carrier, Laine & Co. have secured contract for building steel barge for the Montreal Transportation Co., cost \$80,000.

ELMIRA, ONT.—The tender of G. A. Simson & Co., of Toronto, has been accepted by the council for purchase of \$5,000 debentures; price \$4,951.

MONTREAL, QUE.—A. J. Cook, architect has let contracts for a house for J. H. Sheppard on Western ave. and Lansdowne street; Masonry and brickwork, McGarth & Sons; carpenter work, R. Neville, jr.; roofing, Geo. W. Reed; plumbing, J. H. Gardiner Bro.; plastering, H. Contant; electric wiring, H. Simon; steel work, Dominion Bridge Co.; painting, W. Rand.

PICTOU, N. S.—Following is a list of the bidders, with accepted tender, for material for waterworks for this town: Straight pipe—Montreal Pipe & Foundry Co., Londonderry, N.S. (accepted); U. S. Cast Iron Pipe & Foundry Co., Philadelphia, U.S.; Camden Iron Works, Camden, N. J. Special castings—Thos. A. McLean, Charlottetown, P. E. I. (accepted); The Brown Machine Co., New Glasgow, N. S.; Nova Scotia Cast Iron Pipe & Foundry Co.; Camden Iron Works; Montreal Pipe & Foundry Co.; Robt. Hannan & McDonald, Pictou, N.S. Gates and hydrants—The Rensselaer Mfg. Co., Troy, N.Y. (accepted for gates only); The Brown Machine Co. (accepted for hydrants only); Robt. Hannan & McDonald; Canada Foundry Co., Montreal; Coffin Valve Co., Neponset, Boston, Mass.; Drummond, McCall & Co., Montreal; Chapman Valve Co., Indian Orchard, Mass.; Thos. A. McLean; The Darling Pump Mfg. Co., Williamsport, Pa.; The Eddy Valve Co., Waterford, N. Y.; The Camden Iron Works. Pumping Machinery—The Smart-Eby Co., Hamilton, Ont. (accepted); Northey Co., Toronto, Ont.; John McDougall, Montreal; Stilwell-Bierce, Smith-Valle Co., Dayton, Ohio; The Bart Pump Co., Boston, Mass.; The Dean Pump Co.,

Holyoke, Mass. Boilers—Thos. A. McLean (accepted); The Robb Engineering Co., Amherst, N.S.; The Smart-Eby Co.; John McDougall. Stand Pipe—The Chicago Bridge & Iron Co., Chicago; E. Hodge & Co., East Boston; T. A. McLean, Charlottetown, P.E.I.; I. Matheson & Co., New Glasgow, N.S.; Cunningham Iron Works, Boston; John McDougall, Montreal; contract for stand pipe not yet awarded.

#### BLASTING.

(Continued from last issue.)

A few points of prime importance which should be observed are the following: First the strength and quantity of the explosive should be properly proportioned to the cohesive strength or resistance of the rock.

Second, the "burden," or line of least resistance (i. e., the shortest line that can be drawn from the charge in the bore-hole to the outer free face of the rock,) should bear a proper relation to the strength of the explosive and to the resistance of the rock.

Third, if the working face of the rock is so blasted as to leave two or more free faces instead of one for future blasts, the power required to overcome the resistance of the rock will be reduced, and explosives can be economized.

Fourth, a seam or fissure is a valuable aid in blasting if the hole is so located as to take advantage of this weakness, and, on the other hand, the power of the explosion be expended along such a seam without doing useful work if the hole is improperly located.

Fifth, breaking to regular benches and faces is more economical than irregular breaking, because the condition of the rock can be more carefully observed, admitting of a more intelligent placing of subsequent bore-holes, and it facilitates the handling and setting up of machine drills. It is also more convenient for work by hand drilling, in addition to which it keeps the mine in better condition for a complete and economical extraction of the ore.

Sixth, simultaneous firing is more economical in most cases than firing singly or in series, for the reason that the adjacent charges assist each other, reducing the amount of explosive required and the total length of holes to be drilled for any given volume of rock.

Seventh, careful charging, so as to secure as highly compacted a charge as possible, greatly increases the efficiency of the explosive.

Eighth, a well prepared primer, in the case of high explosives, is the key to a successful detonation of the charge, on which, other things being equal, its efficiency depends.

Ninth, the efficiency of all explosives, including high explosives, is dependent to a considerable extent upon the kind, length and degree of compactness of the tamping.

Tenth, the object of blasting in mines and quarries is to rupture rock so that it may be removed, not to hurl it to a distance, i. e., not to secure what military engineers call "ballistic" effect. Hence only enough explosive should be used to accomplish this. When fragments are thrown more than a few feet by a blast it is generally an evidence that the proper relation did not exist between the charge and the "burden" and that too large a charge was used for