

Under the first division (A) should be included the cost of fuses, meters, transformers erected, and secondary connections, line construction, maintenance, etc., and such proportion of the operating and general expenses as is not increased by increasing the current consumption per lamp hour. Under (B) should be included that portion of the cost of service per lamp hour exclusive of lamp renewals that increases proportionately to the current consumed per lamp hour. These divisions of cost should be so made that the sum of A, B and C will represent the total cost of service per lamp hour; the values of A, B and C representing the above divisions of cost having once been established for a lamp of any given efficiency and average life for any particular lighting station, the cost of service per lamp hour for this same station with any other lamp which has a current consumption different from the current consumption of the first lamp, and having an average life of "Y" hours, would be $A + XB + C$ — the cost of service per lamp hour, "X" representing the proportion between the current consumption of the lamps being compared, and "C" being the cost of one of the new lamps, plus the cost of replacing one exhausted lamp divided by "Y," the average hours of life of the new lamp.

This formula applies for comparing the cost of producing light with lamps having different costs, efficiency, and average lamp life, when they are to be burned in the same plant and under the same conditions of average lamp hours burned per lamp installed, and the same maximum number of lamps burning for a given number of lamps wired. Value (B) in this formula includes the coal consumption and the materials which practically vary proportionately to the watt hours' output required for providing the light. It also includes the interest and depreciation on the plant, which must be enlarged when the lamps consume large amounts of current, because the generating and supplying capacity of the plant must be proportionate to the maximum output called for by the lamps. In many plants the interest and depreciation account will form quite a considerable portion of the factor B, and as a large value to the factor "B" makes a showing against the high consumption of current per candle-power hour very bad, it would appear that any lamps installed that did not burn at the time of maximum current output from the station, could be economically used of a poorer efficiency, with longer life, than lamps which do burn at time of maximum output, because any additional demand for current on a plant that is not a call for current at the time of maximum output, does not require an increase of plant capacity. In estimating the best efficiency per candle power hour, per lamp hour, for these lamps that do not burn at the time of maximum output, the cost of interest and depreciation entering into the factor "B" in the formula (in fact all the costs that increase proportionately as the size of the plant required to serve the lights wired) should be excluded from the factor "B." The result is that lamps that do not burn at the time of maximum output can be economically used of considerably lower efficiency than lamps that do burn at that time.

Industrial Notes.

THE sewage interception plant to be built in Hamilton, Ont., will cost \$85,000.

THE McTavish Reservoir, Montreal waterworks, will be repaired at an expense of \$50,000.

THE Nelson, B.C., *Miner* says that the Montague Paper Co. is building an addition to the Nantais mill.

THE Tudhope Carriage Co., of Orillia, Ont., is getting out plans for a \$13,000 enlargement to its premises.

PAXTON, TAIT & CO., Port Perry, Ont., have recently equipped a saw mill for G. G. & W. C. King, Chipman, N.B.

THE Benjamin Co., manufacturer, wooden ware, Yarker, Ont., is having a siding of the N.T. & Q.R'y run to its works.

E. S. STEPHENSON & CO., St. John, N.B., are putting in a new 60-horse power high-speed engine for their pulverizer works.

JAS. FINDLAY has applied to the Victoria, B.C., city council for encouragement in establishing the manufacture of mining machinery.

R. SMITH, manufacturer paper-makers' machinery, Sherbrooke, Que., is moving into new quarters in the Jenckes Manufacturing Co.'s works.

THE Maritime Nail Co., St. John, N.B., has received from the works of E. Leonard & Sons an automatic cut-off engine, which they are placing in position in the factory.

WESTPORT, ONT., has a cheese box factory, Nelson McKim, manager.

A LARGE number of the streets in Winnipeg are to be paved with asphalt.

THE town of North Sydney, N.S., will lay six miles of cast iron pipe of 4, 6, 8 and 10 inches diameter.

THE Toronto Radiator Co., Ltd., will build an addition to its factory on Dufferin street, to cost \$4,000.

W. E. BARNETT, of Almonte, Ont., has removed the machinery to his new wood-working factory at Arnprior, Ont.

THE Sims' Lumber Co., Sault Ste. Marie, Ont., has placed an order in Toronto for a large boiler and mill machinery.

ENGINEER MOORE, of London, Ont., is preparing an estimate for the town of St. Mary's, Ont., of the cost of the proposed waterworks.

THE town of Listowel, Ont., is preparing plans for an expenditure of \$15,000 in waterworks improvements and a street lighting plant.

THE Small & Fisher Co., Woodstock, N.B., is shipping machinery and agricultural implements to England to fill orders received.

THE Russel water power at Sturgeon Falls, Ont., has been bought by United States capital, and a pulp mill will be erected this summer.

THE bursting of the cylinder in the engine in Kaufman's planing mill, Berlin, Ont., recently, wrecked the engine, and a new one is being put in.

THE furniture factory at Strathroy, Ont., 150 x 55 feet, is being pushed towards completion, and Smyth & Merritt expect to have it running by August 1st.

JOHN McLAREN, of Renfrew, Ont., who lately sold his roller mill in that town, is building a new one at Mile End, at the junction of the C.P.R. and C.A.R., near Montreal.

THE Peterboro Bridge Co. is building a new steel bridge over the Catfish Creek at Stevens' mill, near Aylmer, Ont., and also a county bridge between Dereham and Malahide, Ont.

THE Gardner Tool Co. and the city of Sherbrooke, Que., have signed the agreements made necessary by the recent vote of a bonus by the city. The new works are expected to be in operation in the fall.

THE Hamilton Powder Company gives notice that it will apply to Parliament for authority to change the head office of the company from Hamilton to Montreal, to increase its capital, and to increase the amount for which the company can issue bonds.

THE Toronto Brass Co., Ltd., 88 York street, Toronto, is beginning the manufacture of cabinet and builders' hardware, gas, electric and combination fixtures. A first-class plant has been put in and the manufacturing department is under the management of T. H. Stephenson, formerly manager of the Toronto Lock Co., Ltd.

W. J. BURROUGHS and Joseph Wright, of Toronto, organized the Master Plumbers' and Steamfitters' Association in Hamilton, Ont., recently. The officers are: Wm. Fairley, president; W. J. Walsh, vice-president; Hugh Wallace, secretary; Adam Clark, treasurer; Wm. Smith, sentinel. The association will be represented at the convention to be held in Montreal this summer.

THE gravitation system of waterworks put in last year in Beamsville, Ont., having proved satisfactory, the neighboring village of Grimsby contemplates having a system of waterworks also, and the council has instructed Marshall Hopkins, C.E., of Hamilton, Ont., to report on the mountain springs available, and if sufficient water cannot be got from these to report on the cost of pumping from Lake Ontario.

At the monthly meeting of the Iron Founders' Association of Montreal, held recently, J. Best, of Warden King & Son, who was a representative at the meeting of the National Association of Iron Founders, held recently in Philadelphia, and who was elected a vice-president of that association, gave a most interesting account of the proceedings, which were of a character to benefit anyone connected with the trade.

THE Babcock & Wilcox Co. have consolidated their Canadian sales department with their general sales department, at New York and given up their office in Montreal. No change will be made in the manufacturing department, and the Canadian shops will be maintained, and all boilers built here as at present. Wm. T. Bonner, resident manager for the company's Canadian business for nearly two years past, will remove to Atlanta, Ga., having been appointed manager for the company's south-eastern territory. Mr. Bonner made many good friends during his stay in Canada.