and stationary parts, is here illustrated. Thus, in these motors of 700-h.p. each, the air-gap for each of two is said to be only 3-32-in., and the air-gap for each of four only 0,0285 in. from iron to iron. Each of these motors is direct-connected to a continuous-current generator that supplies the street railway system at about 550 volts.

The plant of the Dominion Cotton Mills Company is probably one of the largest of its kind that draws its power from a public system of electrical supply. In these cotton mills the total number of electric motors is 27, and their combined rating amounts to 3,412-h.p., divided as follows: Number of motors, 5 of 300-h.p. each, 1 of 240-h.p., 5 of 200-h.p., 1 of 150-h.p., 2 of 100-h.p., 2 of 75-h.p., 1 of 50-h.p., 1 of 30-h.p., 1 of 20-h.p., 2 of 15-h.p., 2 of 10-h.p., 1 of 7-h.p., 3 of 5-h.p. All of these motors in the cotton mills are of the induction type, save one of 200-h.p. capacity, which is synchronous. The fact that the Montreal electrical supply system is able to furnish power for this great manufacturing plant on terms that make it unprofitable for the latter to operate with steam is a striking illustration of the advantages of transmitted water power.

Of the transformers used for lighting, 1,068 are of less than 5-K.W. capacity each, 314 have an individual rating of just 5-K.W., and 779 transformers are rated at 7½ to 60-K.W. each, all having a combined rating of 13,249-K.W., and of this total those of less than 5-K.W. each represent 2,222½-K.W., of just 5-K.W. each, 1.570-K.W., and of more than 5-K.W. each an aggregate of 8,930-K.W. capacity. Of the transformers used for power service, 273 are rated at less than 5-K.W. each, 98 have just this individual capacity, and 324 are of larger sizes up to 170-K.W., and their combined rating of 6,980-K.W. used for power purposes is divided into 620-K.W. for those of less than 5-K.W. each, 490-K.W. for those of just 5-K.W. rating, and 5,867½-K.W. capacity in those of from 7½ to 170-K.W. each.

Comparing the lighting and the power transformers, the average rating of all the former is 6.1-K.W., and of all the latter 10.0. Of the aggregate rating of 3,249-K.W. for all lighting transformers, 67 per cent. is in units of more than 5-K.W. capacity each, while of the 6,980-K.W. of total capacity in power transformers, 85 per cent. is represented by those of more than 5-K.W. each. These figures bring out one desirable feature of a motor load, namely, that the transformers required for its operation are usually of larger average capacity and consequently of higher efficiency than those used for lighting. Large motors of 100 or more horse-power each have the further advantage that they may take current directly from the distribution lines, and thus require no service transformers whatever.

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The Public Works Department, Ottawa, Ont., has advertised a sale of the electric lighting plant at the foot of Parliament Hill. The Government find that the light can be had more cheaply from the Ottawa Electric Company, and the equipment is now being sold out.

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The Crowland Natural Gas Company has contracted to supply gas to the Niagara Falls Gas Light Company, and a main will be laid to Montrose bridge. The Clifton company is also pushing its pipe laying. It has leases in the Crowland field, but is laying a main from the Winger field, where it has developments.

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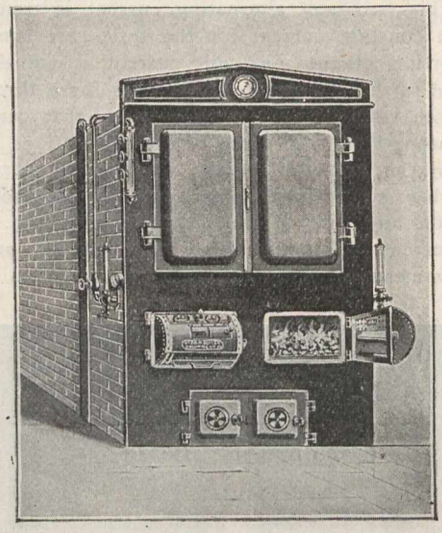
"HYDRO-CARBON" SYSTEM OF COAL BURNING.

The Steam Boiler Equipment Co., of New York, have appointed P. E. Durst & Co., Yonge St. Arcade, Toronto, as their agents in Canada for the "hydro-carbon" system of coal burning. The claims made for this system, as stated in the company's literature, are as follows:

"The system is based upon natural laws and accomplishes its results in a simple manner, and its apparatus is easily equipped to any type of boiler for any steaming purpose, at a very moderate cost, without any change in the setting of the boiler or in the fire chamber or of the grate bars, and can be used or discontinued at any time without disturbing the fires. A specially designed patented door apparatus is substituted for the ordinary fire door, so arranged that the air is heated first and passed into the fire chamber over the fire, and by a peculiar arrangement distributed in proper proportions (suited to varying conditions of fuel used or requirements), to form an induced draft, supplying to the carbon from the coal the needed amount of free oxygen to change the conditions of the combustible gases from carbonic oxide to di-oxide and monoxide gases—thus obtaining from every pound of coal burned nearly double the amount of heat units, largely decreasing the temperature of escaping gases in the chimney, and leaving in the ash pit only the clay residuum of the coal. The carbon laden smoke from soft coal is prevented as the carbon is turned into combustible gases and heat units, in the fire chamber. In addition another element of heat is added to the coal, by superheating a small amount of steam in a heavy metal retort (of special design



and material to withstand the heat), and disassociating the steam, thereby forming hydrogen gas which is ejected into the fire chamber, in combination with the induced draft, thus forming a powerful adjunct and increasing largely the ratio of evaporation, owing to less frequent firing and use of slicing bars, less deposit of soot in or on tubes and shell, and less ash to remove; labor is saved, often dispensing with coal passers or giving the firemen more time for other duties. It is a well established fact that bituminous or soft coal will produce more heat units than anthracite or hard coal, and is therefore preferred for steam production, but in ordinary methods of burning soft coal so much objectionable smoke is produced by escape of free carbon, that it has been largely prohibited in the cities, and always is an exhibit of money and undeveloped power wasted in the atmosphere."

Among the points claimed for the system are: There is no disturbance of the fire box or change of grate bars in installing the apparatus; no building of fire walls or ducts or interference with steam pipes, nor are blowers required; the boilers are not altered and tubes do not require so frequent cleaning. This system has been installed in the new Flett-Lowndes Building, and the J. F. Brown Co.'s new building, in Toronto, and other installations are under way. Further information can be had from P. E. Durst & Co.

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According to the Victoria, B.C., Times, it is not likely the Grand Trunk Pacific terminus will be located until next summer. The chief engineer of the company on the Pacific coast, Mr. Van Arsdol, says no decision has been reached as to a terminal point. He took parties to points along the northern coast a few months ago, and these are conducting a reconnaissance survey. They are spending a good deal of time on water, and the harbors are being examined from the standpoint of their suitability for water communication. It is announced that 250 miles of coast line is being examined, and it is, therefore, assured that the company will consider harbors at least as far south as Kitimaat. With the Yukon trade in view, the company may seek a point as far north as practicable. Some of the parties now in the field, it is said, are making a careful survey of the mouth of the Skeena.