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For THE CANADIAN ENGINEER.

ECONOMICAL ELECTRIC LIGHT AND POWER.

BY J. H. KILLEY, HAMILTON.

The city of Belfast has a population of 275,000 souls. The corporation owns and operates the gas works, and in order to prevent an electric lighting monopoly they took that matter into their own hands and have put into operation the most economical plant now known. This was secured by running their dynamos by new and very powerful gas engines. Those now in position and working are capable of developing 500 h.p., with room for a large addition when needed. Builders of first-class engines will now guarantee to develop one horse-power from every pound of coal used. Thus, for a 500-h.p. gas engine only 500 lbs. of coal per hour would be used, as against double the quantity required by the most economical compound condensing engine, and three and one-half times the quantity in the best automatic cut-off high pressure engine, with the most economical boiler in use to generate steam. By means of this gas engine, the electric lighting plant could operate five hundred 2,000-candle-power arc lamps for eight hours, with 4,000 lbs. (two tons of coal), or six thousand 16 candle-power incandescent lights, with the same amount of coal. If power were sold to those requiring it from such a plant, it could be done much more cheaply than is possible with steam, where the current is supplied to motors of the most approved design Among other advantages this economical power can be placed in the centre of distribution, which is impossible with a compound condenser of the same power as the gas engine. A compound condenser of the same power as the Belfast gas engine would require 900 gallons of water for the boilers and 20,000 gallons for the condenser per hour. This would necessitate the proximity of the engine to so large a supply of cold water as is not often available in a city, and could not be taken from the city waterworks. A further advantage of placing the dynamo at the centre of consumption is that a smaller quantity of copper-conducting wire is required, lessening the first cost, and the reduced resistance giving increased light with less electric potential at source of supply. There is also the cost, danger, depreciation and maintenance of boilers, not less than six in number of 100 h.p. each, and the cost of increased labor required to run them, to be considered. Not only is this power suitable for the production of electricity, but it is equally applicable to pumping the water supply of a town or city.

GAS ENGINES FOR POWER PUMPS.

Our readers will be interested in some account of the large gas engines recently built to the order of the River-Wear Commissioners, England, to pump out their new dry dock for the examination and repair of ships and steamers. These engines, rated at 250 horse-power, are attached direct to two centrifugal pumps, built and erected by Tangye Brothers, engineers, of Birmingham. This firm guarantees to build gas engines that will run with less than one pound of coal per brake horse-power per hour; this is more than an indicated horse-power. These engines and pumps were recently tested and were in every respect an entire success, as they worked more economically and pumped out the dock in less time than the contractors guaranteed, their pumping capacity equalled 10,500 tons of water, lifted about thirty feet high at finish, in two hours, emptying the dock in that time. In addition to the main gas engines and pumps there are auxiliary engines and pumps of smaller size to keep the docks clear of water when vessels are docked in it. The gas mains to the engines are attached to the ordinary gas mains of the district, and the gas is supplied at a comparatively low price, as there is plenty of gas coal in the neighborhood.

If the dock had to be pumped out by steam power at least four large boilers would have been required, these would require the fires to be started about two hours before the time the pumps would be in operation, and one boiler would have to maintain steam the whole time the dock would be occupied. The cost of the gas to pump out the dock would not exceed the cost of the coal used to get up steam before the engines were started, the gas engines could be started in ten minutes from the time of receiving the order, and the cost for labor and gas being less than one-half of that by steam, as the cost of gas and labor only commences with the working of the pumps and ceases as soon as they stop. Nothing is clearer than the fact that power for most purposes can be produced at much less cost than steam power by aid of the most modern and approved form of gas engines and gas plant. There is also, it is asserted, less cost of plant and maintenance, and no danger of disastrous explosions.