a considerable number of men the year round. The whole plant has been laid out in such a way that the latest and most modern railway practice has been provided for, and the design will be second to none in the country.

The plant has been laid out under the supervision of Mr. Gordon Grant, Chief Engineer. The design of the plant, the relative size, arrangement and position of the buildings, together with the selection of the machinery and appliances, has been entrusted to Mr. W. J. Press, Mechanical Engineer, who has had charge of similar work at the Transcona Shops of the National Transcontinental Railway, which are now being operated, and which, in general plan and in kind and quality of equipment, are of the most up-to-date type. The Transcona and the Leonard Shops (when the latter is completed) will embody the latest design and the most modern practice, enabling them to be operated with a very high degree of efficiency. Altogether they will form a most valuable addition to the second of the great National "cross-continent" highways of Canada.

The contract for the construction of the shops was recently awarded to Mr. Joseph Gosselin, of Pt. Levis, Que., and construction work is under way.

A NEW CHEMICAL INVENTION.

While Mr. Henry S. Blackmore, one of the most distinguished chemists of the United States, was in Ottawa, he claimed that he had perfected a process of not only liquefying, but also of solidifying natural gas, and that either the liquid or solid could be used as a motor fuel. The fluid is ethereal in character, like gasoline; and from 8 to 10 gallons are produced from 1,000 cubic feet of gas. This fluid has the advantage over gasoline both in that it can be produced at a first cost of two cents per gallon, and in that it leaves no carbon deposit to clog the cylinder. In the form of a solid, a cubic foot of the fuel weights about 5 pounds, and comprises the condensed product of 2,500 cubic feet of natural gas. It has the appearance of crystallized paraffin, softens to putty-like consistency at 212 degrees, and at 312 degrees turns to gas again. The solid also is superior to gasoline in that a cubic foot of it will carry an automobile 12 to 15 times as far as a cubic foot of gasoline, and in that the solid as well as the liquid is safe to handle. Interests controlling the inventions of Mr. Blackmore have secured large gas fields in the United States and in Canada, and will manufacture this motor fuel at 10 cents per gallon or less; and natural gas in blocks will be shipped from the wells to the consumer.

WIRELESS RESEARCH.

The International Wireless Company has decided on the organization of committees in all the countries adhering to the wireless telegraph treaty, which was signed at London, in July, 1912, to aid the governments in extensive wireless observations and experiments. These will be carried out with the object, first, of determining a way to insure constancy and steadiness of wireless waves; secondly, measuring the variations in the signals and atmosphere disturbances at the different stations; third, comparing the intensity of the signals. These experiments will be conducted simultaneously on three days of each week, beginning in January. Special meteorological observations will also be made once a month. Reports of the work of the committees will be made to the wireless conference at Brussels in 1914 with a view to legislation.

THE MUNICIPAL ENGINEER AND PUBLIC HEALTH.

THE variety of problems that arrange themselves under the heading of "Duties of Municipal Engineers," is constantly being added to, and each unit continues to expand. Those which have to deal with public health were summarized by Mr. J. Antonisen, superintendent, Brandon Municipal Railway, in a paper which was read at the Public Health Congress in Regina some weeks ago. The subject was dealt with without effort toward comprehensiveness, but included those items only that fall within the borders of the engineer's work toward the establishment of a healthy community. According to Mr. Antonisen, they constitute the following lengthy list: A pure, plentiful water supply; proper sewage system; effective drainage system; well-organized system of collecting and destroying the garbage; sanitary lighting, heating and ventilating system for our public buildings and private houses; development of power to operate our public utilities and factories; cheap and safe means of transportation, both by urban and interurban and the larger railroad lines; proper construction of highways, roads, pavements and sidewalks; efficient maintenance and cleaning of our streets; proper city planning; liberal provision for park areas in our congested cities, and for playgrounds, public baths, comfort stations, and a hundred other items, which all come within the scope of the engineer's duties.

Of these, the first several are prominently important, and are dealt with by Mr. Antonisen as follows:—

Water Supply.—When the pioneer goes into unknown regions to find a new home for himself, his first problem is: Where can water be obtained for all kinds of domestic purposes? He locates his house near a lake, a river or a creek, and when other settlers follow, they ask the same question with respect to water supply. It is, therefore, not purely accidental that the majority of villages, towns and cities are located near rivers and lakes.

The pioneer's cabin becomes surrounded by settlers' houses; in course of time a village or small town grows up, and the community is gradually confronted with all the problems which have just been enumerated. At first the so-called practical men try to solve these questions, but sooner or later in the development of each town, the time comes when it becomes apparent to everybody that the state of things bespeak the need of an engineer.

By advertisement or by application to some large city a number of candidates for the position are obtained, and after due consideration the community selects their county or town engineer, who is then expected, for a salary of $75 to $125 per month, to be an expert in all branches of civil engineering. Thus the average town engineer puts up a bold front, commences to lick things into shape and, although he makes many daring leaps into darkness, he generally lands on his feet. By constant hard work and diligent study, seeking advice and information in engineering literature and from more experienced colleagues, he gradually develops into that modern wizard—the city engineer. During his development period he has laid out systems for waterworks, sewerage, built sidewalks, streets, bridges, subways, sewage disposal plants, reservoirs, water towers, dams, incinerators, grandstands, race tracks, and a thousand other things.

As long as the town is small it is contented to pump the water from a river or lake and using it without any