bill having been read for the first time in the British house, and will be passed immediately on the assembly of the next parliament, placing petroleum vehicles under the same regulations as the ordinary traffic. As a consequence, some of the most eminent of the English agricultural and other engineering firms are preparing to go very largely into their manufacture. The London *Engineer* has offered 1,000 guineas ($5,250) to be run for by high road motor carriages in the near future. The judges will be gentlemen in whom the public will have entire confidence, so that the business of manufacturing them will be one of great importance in the near future there.

Our neighbors across the border are also preparing to take advantage of the altered state of matters in this respect, a large factory being now equipped for their manufacture at Long Island City. Another is in operation at Baltimore. Chicago is also moving in the matter. It is intended there that a prize competition for a large sum will take place in the States in the near future; the Chicago *Times Herald* has offered $5,000 to be contested for in November next. Price lists for petroleum motors for bicycle, tricycle, road carriages, yacht engines, and stationary land engines, are also in circulation. A 4 h.p. yacht engine of this class is offered to be placed in Hamilton for $180; this includes shaft and reversing gear, but when it is considered that the motor only weighs 60 lbs., the price appears to be ample. A two cylinder engine for a bicycle or tricycle is stated to weigh 12 lbs. I have been repeatedly asked if the petroleum is used to get up steam in these engines. I have simply to say that there is no steam or steam boiler. The petroleum is vaporized for each stroke of the piston, and is mixed with 10 to 12 parts of atmospheric air. It is fired by an electric spark from a small battery or from an incandescent platinum wire into an expansive vapor, giving a pressure on the motor pistons of from 150 to 180 lbs. to the square inch. This, in a thermo-dynamic sense, is very much more economical than steam. In the best steam engine not more than 10 per cent. of the heat is realized as power, while in the best form of oil engine 30 per cent. is stated to be so realized. It is time that Canadian manufacturers were moving in this matter, instead of importing many thousands of dollars worth of them as in the bicycle trade; build them here to start with, and employ our own mechanics; the construction of the latest design is of a very simple character.

THE LAWRENCE GAS MIXING AND ATOMIZING PROCESS.

As mentioned in THE CANADIAN ENGINEER, a new company is being formed, and will probably be in operation next month, for operating in this country the Lawrence system of gas mixing and atomizing. At the present date over three-fourths of the capital has already been subscribed, and the new company, whose headquarters are in Montreal, will probably be ready for actual business in the course of a month. The company is incorporated as the Canadian Cold Process Gas Co., Ltd., with a capital of $100,000, and the provisional directors are: Robt. Bickerdike, Hon. A. W. Ogilvie, G. N. Ducharme, F. J. Freese, Wm. Abbott, J. G. Ross and W. P. O'Brien.

Of the many processes that have been brought out within the last few years for the improvement and cheapening of gas, the Lawrence system is remarkable, not only for the economy effected in gas consumption, but for the ease with which the system can be applied both to existing works and to towns where no gas plant exists. The attachment of the "mixer" to an existing gas plant can be made in a day and without closing down, and no change is necessary in the ordinary style of burners, either for lighting or heating. One main or any number of mains may be thus changed to the new process independently, or a branch or any number of branches. The process can be applied also to coal or water gas.

Gas companies, by the use of the Gas Mixer and Atomizer, can extend their business over a wide area without the cost and trouble of laying mains. By the addition of an air pressure machine, of which there are many different styles on the market, small towns, factories, churches, dwellings, etc., may be lighted more economically and satisfactorily than by any other method now in use—the illuminating power being greater in proportion to hydro-carbon used. Used for isolated lighting and heating, the gas can be changed in two minutes from a pale blue flame for heating in the daytime, to a soft, rich, white light in the night-time. The gas may be employed for driving gas engines, cooking, heating, blacksmithing, soldering, the laundry, etc. Being absolutely free from sulphur and other injurious matter, it can be used in the most delicate metal working.

The exhibition that is being given daily in Montreal shows excellent results. Tests made here show that ten times the ordinary illuminating power of the Montreal gas is obtained when the gas is put through this process, while the consumption is reduced one-half. When applied to the Auer light the result is proportionately satisfactory. With this light only ½ cubic foot of gas was consumed as compared with 3 cubic feet of coal gas.

Professor William Foster, M.A., F.C.S., Dr. John Hopkinson, F.R.S., Professor A. Vernon Harcourt, F.R.S., and Professor Adolph Levy, all noted gas engineers and chemists, and Professor D. Monnier, of Paris, have made exhaustive tests and reports which show an average economy under many different conditions, of some 63 per cent. in use of the Lawrence Atomized Gas. Patents have been taken out for the process in all the principal countries of the world.

The fundamental principles of the Lawrence process are—the introduction of the hydrocarbon at a very low temperature below the degree of vaporization; the hardening of the particles (whether originating in the gas or in the liquid carbon) by chilling; and the atomizing of these particles of carbon, etc., by friction. While heat is the idea of all other processes, cold is the foundation of this. The introduction of vaporized hydrocarbon for the enrichment of gas is always followed by condensation, except where the temperature has been raised to the decomposing degree, in which case great loss in illuminating power results. The particles of carbon, etc., cannot be atomized except by heating to the point of decomposition, or by friction and attrition—or rather by the friction of attrition—when hardened by cold; and without atomization, perfect combustion cannot be attained. It is shown by the tests made here, that the thorough atomization of the Lawrence process not only ensures the highest illuminating results; but the perfect combustion thus attained, destroys the sulphur and other unpleasant properties, which render ordinary gas so unpopular with consumers.