

three years' ordinary work, and in one case an engine of 400 H.P. ran seven months continuously without being stopped. And there are a number of instances of large engines running 97% of the total hours of the year, the 3% including stoppages due to all causes, either affecting the engine or the electrical part of the combination."

"The requirements of the electricians for steadiness in running and accurate governing, have now got far beyond anything anticipated some years ago."

For great accuracy in the governing of large engines of the "Otto," or four stroke type, it is desirable to use four cylinders in any suitable combination, and an impulse automatically regulated by the governor; such an engine, if properly constructed, will give almost perfect regulation. In two engines tested by Mr. James Atkinson, M.I.C.E., the variation between full load and no load, was three-fourths of one per cent.

*Ignition.*—The hot tube ignition has proven the more satisfactory, and when suitable gas is available, it is impossible to improve on it for stationery engines. Hot metal tubes have, however, almost entirely disappeared, and long life porcelain tubes taken their place.

"When two tubes are fitted to an engine, each with its own chimney and flame, its own separate ignition valve and gear, with means of shutting off either to replace a burst tube without stopping, it looks as if there were not much room for improvement in this direction."

There are numerous instances when a suitable gas supply is not available, and electric ignition has to be used. For this purpose, unless a constant supply of electricity is to be had, small dynamo machines are considered the best.