

oil-engines.—Do not question me as to your ability. My explanation was perfectly clear, as given to the Chairman some little time ago. (See 213.)

282. There is nothing very special about a Sampson battery?—No; but that is not in use except for certain purposes. There are a good many other batteries coming into operation.

283. What would you think should be the knowledge an Examiner should have for examining marine engineers to take charge of auxiliary-powered vessels?—In the first place, he should be a thorough mechanical engineer, and in the second place he should have every knowledge with regard to the repairs and alterations required for engines that are in use; and then he should have a thorough knowledge of all the little technicalities and difficulties that arise in running an engine, and a thorough theoretical knowledge of the gas- or oil-engine.

284. *The Chairman.*] There are two things the Committee and the House will require to know: firstly, are the present Inspectors in Auckland capable of examining candidates to drive these oil-engines; secondly, what experience should the driver have?

285. *Mr Duncan.*] Mr. Henderson has already said that he is a practical engineer, and that Examiners should have sea-experience, preferably. Well, both these qualifications are possessed by the present Examiners. Then he also says they should have shop-experience?—Preferably so.

286. What limit would you put on the shop-experience?—The lowest experience, I think, should be two years.

287. As the vessels increase in power do you not think the men should have more than two years' shop-experience—say for 200-horse-power?—It will be some little time before 200-horse-power engines will be used.

288. Is it not a fact that the firm Mr. Lane represents build engines up to 200-horse power? Their catalogue says 200-horse power?—I think they do, but I have not seen one.

289. Do you think a boy in the first year, or, say, the second year, would be able to take charge of a 200-horse-power engine?—We do not have 200-horse-power engines.

290. Do you think three years would be a small enough limit for a man who has to run a passenger-carrying vessel?—If you are going to have 200-horse-power engines, and to carry passengers, I say you should certainly have a man with three years' experience; but there must be some difference between those and the little boats.

291. *The Chairman.*] The primary point is the Examiner: Are the Inspectors in Auckland capable of examining candidates?—They are quite capable of examining applicants, providing they have some little further experience conveyed to them with regard to the technicalities of an oil-engine.

292. You put in the word "providing"?—It would be difficult for me to say whether they knew all the technical points. If I said to them, "Start my engine and run me up Pine Island and back again," I should very soon know.

293. You are aware that the Examiners appointed by the Board of Trade have sea-going experience, and also in America?—Yes, I do not doubt that at all.

294. If I enumerate eight or ten little things that might stop an engine, you could tell the Committee then pretty well all that might go wrong: suppose the supply of oil was choked in the pipe, would it stop the engine?—Yes, if it was choked. If it was only partially choked you could still run the engine.

295. The valves in an oil-engine are similar to those in a steam-engine, and if what you call electrodes did not fire off at the exact time, that might stop the engine?—No, firing late would not stop the engine.

296. Would too little or too much air stop the engine?—Yes.

297. Would a weak battery or too small a spark stop the engine?—Are we to suppose that the engine is supplied with a dynamo? If so, if you had a loose connection, probably, it is possible you might be able to start, and may not. It is a question of degree.

298. Assume that the cylinder was hot and the water-jacket was not properly supplied, would that stop the engine working?—Not for some considerable time. It depends upon how it was placed. Some engines are built without water-jackets.

299. Would pre-ignition stop the engine?—It might or might not. It is not often that happens. No properly-designed engine will preignite.

300. You say that by an adjustment of the electrodes or firing-gear, that would not stop an engine?—If she was firing late it would not stop her, but it will take off the power.

301. Would excessive lubricating-oil stop an engine?—Not unless you filled the cylinder.

302. Will a deposit of carbon stop it?—It depends upon the class of electrode.

303. There are many other points, but these are the principal which would stop an engine. These are not minor points but points that might crop up at any time?—I think some are very doubtful. You are asking me whether these things would stop an engine, and these could only occur through the total incompetency of the man looking after the engine. To get an excessive amount of lubricating-oil in the cylinder you would have to get an oil-can and pour the oil in at the top. You cannot get it through otherwise.

304. Do you think an ordinary driver without mechanical experience could adjust all these electrodes and the other details I have mentioned?—Yes; I have seen that done.

305. *Mr. McLean.*] Are you aware that some of the certificated engineers were not capable of working these engines?—I know of two very distinct instances personally.

306. Engineers of steamers?—Yes. I know of two distinct cases in which the men held the highest certificates, and in both cases they were totally nonplussed.

307. And the chief or second engineers holding sea-going certificates?—Yes. Until they had gained the information which is necessary for men to run these oil-engines, they were just at sea.

308. Were these two engineers at the time on sea-going vessels?—One was, and the other was appointed to take charge of an oil-engine.