

SPARK ARRESTERS ON LOCOMOTIVES. EXPERIMENTS BY THE RAILWAY DEPARTMENT.

The danger of sparks from locomotive engines passing through agricultural districts is a constant source of worry to farmers during the summer months. Particular stress has been laid on the risk which owners of property and farms adjoining the railway lines in our own colony are subjected to in this respect, but in other parts of the world the same difficulty presents itself. For years past the minds of eminent locomotive engineers have been engaged in the task of devising some scheme for effectively dealing with the matter, but only partial success has attended their efforts, and a perfect spark-arrester is yet an invention of the future. In the Legislative Assembly a few days ago, Mr. Charles Harper drew attention to the danger which threatened the agricultural portion of the community by the absence of proper means for checking the issue of sparks from engines consuming Collie coal. Mr. Harper sought to bring about a solution of the difficulty by having the use of Collie coal on locomotive engines put a stop to altogether during the summer months, but this proposition was negatived, the possible ruin of the local coal industry being foreseen by some members of the House if this step was adopted. During the debate it was pointed out that the Railway Department had the matter under consideration, and that the Locomotive Engineer, who had had a good deal of experience of a similar class of coal to that used here, in New Zealand, would be able to deal with it effectively.

The importance of the question raised by Mr. Harper is undisputed, and it will be pleasing to all those interested in the matter to know that the Locomotive Engineer is making every effort to cope with the spark nuisance. When Mr. Rotheram took over the duties of Locomotive Engineer from Mr. R.B. Campbell, about four months ago, he set to work to bring, about some improvement in the mode of dealing with the sparks, which, owing to the size of the boilers and the forced draught required, particularly when mounting grades, are inevitable with locomotive engines. His efforts in this direction, however, have been handicapped to some extent by the lack of suitable appliances, and the many other important subjects which have required his attention. Latterly, though, he has been able to devote a little more time to the matter, and his experiments, we are informed, are likely to prove successful. On Saturday afternoon a representative of the "West Australian" paid a visit to the railway workshops at Fremantle, and was there, through the courtesy of Mr. T. F. Rotheram, afforded ocular demonstration of the difficulties which have to be overcome in inventing a perfect spark-arrester, and the different schemes which the Locomotive Engineer is experimenting with in order to reduce the danger of sparks escaping through the funnel of an engine, to a minimum. "There is really no perfect spark-arrester," said Mr. Rotheram, when discussing the question with the reporter; "if you shut off entirely the means of egress for sparks, you stop the engine, and the point we have to arrive at is where we can get a maximum of effort out of an engine with a minimum of danger."

In New Zealand, where the lignite coal is somewhat similar to our Collie coal, the same difficulty occurred in, regard to sparks as that with which we, in Western Australia, are now faced. All sorts of remedies were tried, and, knowing that there was a fortune in a successful spark-arrester, every idea and plan suggested was given a trial, and at length the soft coal or bell-shaped funnel was adopted. Even now, however, Mr. Rotheram says that the difficulty has not been wholly overcome in New Zealand, although very satisfactory results have been obtained from the system in vogue there. Mr. Rotheram's experience of locomotive engineering extends to India and the United States where the problem of arresting the sparks in their flight from the furnace has been solved in a manner which has not yet been tried in any of the Australian colonies. The practical knowledge that he has gained in other parts of the world should, therefore, enable Mr. Rotheram to take such steps as will enable the Western Australian Government to use Collie coal on its engines with the same degree of safety as is to be obtained from the use of hard or bituminous coal, such as the Newcastle article. The three-sixteenths of an inch mesh with which all the engines are at present fitted has been found sufficient to prevent sparks from rising through the funnel to any dangerous extent when Newcastle coal is used, but as a spark arrester this arrangement is of little use with Collie coal in the furnaces.

Mr. Rotheram has two proposals for relieving the farmers of anxiety regarding their crops when a locomotive engine is passing by their property. One is the adoption of the bell-shaped funnel, and the other is to substitute perforated plates for the wire mesh in the smoke box. The bell-shaped funnel is not ornamental, but its utility compensates for what it lacks in appearance. A class "N" engine fitted with one of these contrivances was examined by our representative in company with Mr. Rotheram. To the lay mind a technical description of the construction of one of these funnels would convey nothing, but its usefulness is easily demonstrable on inspection. The dome of the funnel is shaped like an inverted bell and on the inside a deflector is fixed. When the sparks fly up through the outlet leading from the tubes below they strike the deflector, and the force of the concussion breaks them into fine particles, which at once become carbonised by the steam from the exhaust pipe. Should any sparks chance to pass the deflector, their egress through the vent into the open air is blocked by an internal ring on the outer funnel. The use of perforated plates is a much simpler plan to that already described, and it has an additional merit in that the working power of the engine will be less crippled than by the adoption of the sort coal funnel. Instead of the mesh referred to above, two plates 3-32 of an inch in thickness and three inches apart are fixed in the smoke box. These plates are perforated with holes three-eighths of an inch by one-eighth of an inch, which run longitudinally on one of the plates and transversely on the other. No alteration is necessary to the ordinary funnel, and the expense of fitting in the plates will not be nearly so great as that involved by the adoption of the first-mentioned plan.

A class "K" engine which has been fitted up with the perforated plates was run between Midland Junction and Northam-the heaviest portion of the line-during last -week, and the trial is said to have been eminently satisfactory. Mr. Rotheram has not yet had an opportunity of verifying the results submitted to him by his officers, but he has reason to believe that the device will answer the purpose, in which case it will be adopted on all the engines. On its trial trips the engine is said to have steamed very well indeed, while the absence of sparks was most noticeable. "I am going to give both schemes a fair trial," said Mr. Rotheram before parting, "and the better will be adopted. As the cost of fixing in the perforated plates is only about £5 for each engine, I have given instructions for all engines that are turned out of the shops hence-forth to be fitted with them, as nothing would justify me in not giving the extra safety provided by their use."