

wood and coal of the older formations. The penalty for violation of this rule is a fine of twenty-five dollars, which hardly seems adequate.

The construction and equipment of the locomotive have much to do with the tendency to throw sparks. In England the inclination has been to depend more on the plan of construction of the locomotive than on the arresting screens. In Canada and the United States screens are considered a necessity and are provided for by statutes and regulations. In the modern locomotive there is an extension smoke-box at the front end. Sparks passing through the boiler tubes forward toward the smoke-stack strike against a plate inclined downward, called a baffle plate, and are thrown to the bottom of the smoke-box whence they rise against the netting stretched across the smoke-box to divide it from the smoke-stack and are again thrown back, and so are dashed around until they are finally worn down small enough to pass through the openings of the netting. The regulations of the Dominion Railway Commission provide that every locomotive engine having an extension smoke-box shall be equipped with netting mesh, the mesh to be not larger than  $2\frac{1}{2} \times 2\frac{1}{2}$  per inch of No. 10 Birmingham wire gauge, and to be placed in the smoke-box so as to extend completely over the aperture through which the smoke ascends,—the openings of the said mesh not to exceed a quarter of an inch and one-sixty-fourth of an inch to the square inch. When the diamond stack, the old style, is used the mesh required is  $3 \times 3$  per inch of No. 10 Birmingham wire gauge and it must be placed across the stack so as to entirely cover it. The opening allowed in this case is three-sixteenths and one-sixty-fourth of an inch to the square inch.

The openings of the ashpan must be covered with iron dampers or net screens securely fastened, and the

outflow pipes from the injectors must be put into the ashpans from April to October inclusive.

With these precautions and equipment it would appear as if the question of fires from locomotives was solved, but fires caused by locomotives still continue. Is it that the equipment is not sufficient, or that it is not used and kept in proper order?

The regulations of the Dominion Railway Commission provide that the locomotives shall be inspected by an official of the railway company at least once in every week to see that the equipment is in proper order. Yet fires occur, and when the fact that a locomotive is throwing sparks is brought to the attention of the railway company the invariable reply is that an inspection has been made and the locomotive and equipment are found in proper order. From this it would appear as if the equipment were not sufficient, and as the Railway Commission are satisfied that any decrease in the openings of the netting mesh would seriously interfere with operation, the efficiency of the equipment probably cannot be increased. And it may be frankly admitted that the evidence goes to show that, even with the best equipment, a heavily loaded locomotive on a steep grade or with an unskilful driver will throw dangerous sparks.

But is an *ex parte* inspection by the railway officials sufficient to show that the locomotives are properly equipped? It would seem as if an impartial inspection applied when the case of fire-throwing by a locomotive occurs would be the surer way and the most convincing to the public for determining this question. The Railway Commission has a force of qualified inspectors, but the smallness of the force compared with the extent of the Dominion makes it simply impossible to have a close or quick inspection. To assist towards a closer government inspection the Railway Commission has arranged to give authority to