

DEPARTMENT OF THE INTERIOR, CANADA

Hon. FRANK OLIVER, Minister; W. W. COY, Deputy Minister

FORESTRY BRANCH—BULLETIN No. 16

R. H. CAMPBELL, Superintendent of Forestry

FOREST FIRES AND RAILWAYS

BY

R. H. CAMPBELL

OTTAWA
GOVERNMENT PRINTING BUREAU
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FOREST FIRES AND RAILWAYS

The vicinity to a forest of a railway either in construction or operation makes the danger of fires more intense. This is partly due to causes connected with the railway itself, and partly due to the crowds of land-seekers, prospectors, freighters, tramps and other people equipped more or less generally with a fine bump of irresponsibility who accompany or follow it. The record of each year's conflagrations shows the railways well up in the list of the causes of forest fires. If they do not lead they always follow close in the black array. It is of interest, then, to consider the relation of the railways to forest fires. In doing so the subject will be confined to the fires which are due directly to the railways.

Fires Arising from Railway Construction.

In the construction of the railway it is necessary that the right of way should be thoroughly cleared. If dead tops, limbs and stumps are left scattered over the right of way or piled just outside of it, as has usually been done, they become a veritable fire-trap, and the destruction of the surrounding forest is an inevitable consequence sooner or later. The regulations for clearing the right of way adopted by the Trans-continental Railway Commission are now being generally followed. They provide as follows:—

'The whole, or as much of the right of way as the engineer may direct, shall be entirely cleared of all trees, logs, brush and other perishable matter, all of which shall be burnt or otherwise disposed of as the engineer may direct, unless specially reserved to be made into timber, ties or cordwood. Unless directed in writing by the engineer, trees and brush must not be thrown on adjacent lands, but must be disposed of on the right of way. Trees unavoidably falling outside of the right of way must be cut up, removed to right of way and disposed of.'

But the establishing of a regulation is not the carrying of it out, and in order to ensure the carrying out of such regulations as these thoroughly it is necessary to place a fire patrol along the line of construction. This has been done along the line of the Grand Trunk Pacific Railway through Dominion territory west of Edmonton with good results. Fire from the right of way has not burned forty acres outside its limits, although the right of way has been cleared and burned thoroughly in that district. But the ranger in charge had to use authority and judgment. Some contractors were allowing debris to gather close against the edge of the right of way where, when burned, it would lead fire into the forest. These contractors were stopped and made to clear a space between the brush heap and the forests. In the dry and dangerous season of the year the ranger prohibited burning altogether. The engineers of the railway company, the contractors and the forest rangers all worked cordially together to attain the desired object.

With such regulations and with a good fire patrol to supervise their enforcement the danger should be largely obviated. The uncertainties of handling fire are, however, well illustrated by an incident which occurred in the clearing of the right of way on the construction of the Canadian Northern Railway north of Prince Albert. The refuse was being burned on the right of way and the clearing gang was watching the fire. A small whirlwind came down the right of way, lifted the fire and threw it into the bush over the men's heads and, before it could be stopped, nearly a square mile of bush was burned. In dry, windy weather such a danger is always present, and it gives pause to those who are responsible for the administration when the promiscuous use of fire for clearing land after lumbering operations or on other occasions is advocated.

Fires Arising from Clearing Right of Way.

After a railway has been constructed and is in operation there will still be danger if the right of way is not kept cleaned up, and the Railway Act of the Dominion provides (as do most of the provincial Railway Acts in almost similar terms) that:

'The company shall at all times maintain and keep its right of way free from dead or dry grass, weeds and other unnecessary combustible matter.'

This provision of the Act has, at least in the newer districts, been more honoured in the breach than in the observance, and yet it is one of the most critical and important measures in the prevention of forest fires in those newer districts. The Canadian Pacific Railway Company, in accordance with representations made by the Department of the Interior, are clearing up the right of way through British Columbia and the Rocky Mountains by contract, and are burning the debris at safe seasons. The failure of the Canadian Northern Railway to respond to similar representations was a contributing cause to the fires which did so much damage along the Prince Albert branch of that railway during the past spring.

The necessities of the case left no choice but an appeal to the Railway Commission to have the provision of the Act in this respect enforced. The question was brought to the attention of the Commission, and on the 15th August, 1910, an order was issued by the Board to the desired effect. After quoting the provisions of the Railway Act in regard to clearing the right of way of noxious weeds and combustible material, the order continues:

'Complaints continually come to the Board that these sections are not observed by some of the companies, casual observation in some parts of the country shows that Section 297 (in regard to the removal of combustible material) is being entirely overlooked. It is clear that many fires are communicated to adjacent lands by reason of companies not complying with these provisions of the law, entailing enormous loss. The Board deems it to be its duty to see that these sections are enforced, and to that end has given instructions that all railway lands shall be periodically inspected and full reports made of the conditions found to exist.

'This is a matter of vast moment in the preservation of timberlands as well as the protection of property of all kinds along railway lines, and steps will be taken to enforce the law unless voluntarily complied with.'

The immunity from fire of the forests along the lines of railway in Europe is partly due to their hauling lighter trains and using a better quality of coal, but it is largely due to the careful clearing and keeping clean of the right of way. In addition, however, the forest is kept clear of dead material, and on each side of the railway a path is kept cleared even of leaves and grass, and the surface is broken up so as to provide a fire-break for ground fires.

It will be necessary to clear the dead timber from lands outside the right of way in Canada if safety is to be assured, and when a permanent policy of forest reserves has been established the public interest will make it profitable to do so. Where the railway lines run through reserves, as in the Rocky Mountains Park, steps are being taken to carry out such work. With the vast stretches of forest land along railways in Canada and our uncertain forest policy it is futile to advocate the general adoption of such a plan.

There should be no confusion as to the position in regard to the railway right of way. The present right of way of usually one hundred feet is sufficient for forest purposes, if it is sufficient for railway purposes, and nothing better can be done than to bring the green timber up to the edge of the right of way, but the right of way and a considerable space on either side of the right of way should be thoroughly cleared of dead timber and combustible material.

The burning of old ties along the right of way in a dangerous season is a frequent source of trouble and should be covered by regulation so that the burning should not be done in a time of danger. Most of the railways are regulating this better now than

they have in the past, but it is still a not infrequent cause of damage. Fires starting from such a cause would, however, be considered as caused by negligence and would render the company subject to action for damages under the common law.

Locomotive Equipment.

Sparks from the locomotives are the most frequent cause of fires along the railways. These may be caused by the use of inferior fuel. Wood or lignite coal will, with any screen or device, almost certainly throw fire from the smoke-stack, and it is in the newer districts back in the bush that railway companies are most likely to use such fuel. The regulations of the Dominion Railway Commission provide that no railway company subject to the legislative authority of the Parliament of Canada shall burn lignite coal on its locomotive engines as fuel for transportation purposes.

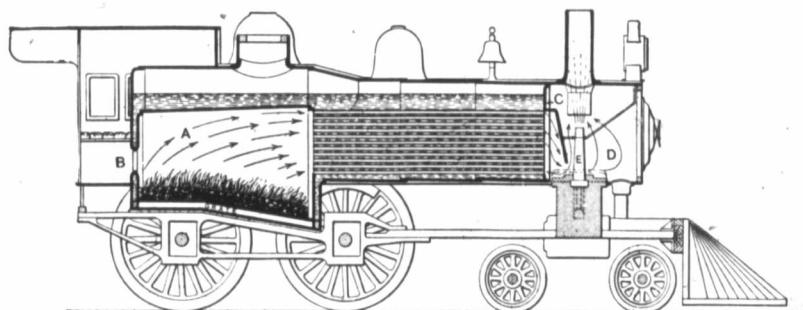


FIG. 2.

Longitudinal section of Locomotive. (A, fire-box; B, cab; C, front head of boiler; D, smoke box or front end; E, pipe from which exhaust steam escapes. Baffle-plate may be seen just below C and behind E.)

Lignite coal is defined as including all varieties of coal the properties of which are intermediate between 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 3×3 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?

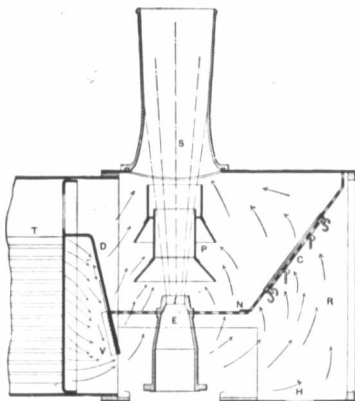


FIG. 10.
Smoke-box or front-end of locomotive. (T, boiler-tubes; D, baffle-plate, or diaphragm; N, netting, dividing smoke-box into upper and lower chambers; S, stack; E, exhaust-pipe. Arrows show direction of draft.)

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 surest 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 some of the permanent forest rangers in the Dominion service at divisional points on the railways to make inspections of locomotives so that inspections may be made immediately when a locomotive is reported to be throwing sparks. With this closer inspection and a careful study of the equipment it may be possible to reach a solution of the problem which will give comparative safety.

The penalty for violation of the regulations in regard to equipment and inspection of locomotives is twenty-five dollars as against the company and fifteen dollars as against an employee.

Damages.

The Railway Act did not until 1903 contain any specific provision in regard to damages for fires caused by railway locomotives. It was apparently considered that the matter was governed by the common law principle that no person should be permitted to use his property in such a way as to result in injury to his neighbour, and decisions in various Canadian cases were given on this principle. On this point being carried on appeal to the Imperial Privy Council in the case of the Canadian

Pacific Railway Company vs. Roy, it was decided in 1902, in accordance with previous decisions in the English courts, that inasmuch as Parliament had given the railway companies authority to run locomotives they would not be liable for damages for doing so, provided no negligence was proved. It may be pointed out, however, that the wording of the Railway Act is to the effect that the railways may operate 'by the power and force of steam' and does not in so many words make lawful the running of locomotives, as the English Act does. The running of a locomotive without statutory authority or the running of a traction engine along a roadway would come under the common law principle.

As the Railway Act requires the right of way of the railway to be kept clear of combustible material the failure of a railway company to keep its right of way cleared would amount to negligence at common law and would make the company liable for the full amount of damages sustained. This would be the case whether the fire was set by a locomotive or otherwise, so long as it originated on the right of way. It might be caused by burning of the combustible material on the right of way for the purpose of clearing, but the company would still be liable for full damages.

But in cases where no negligence of this or some other nature was shown the railway company was not, according to the decision given, responsible for damages.

In 1903, therefore, the question was brought before Parliament by Mr. L. Philippe Demers, M.P., for St. Johns and Iberville, who proposed a provision to make the railway responsible for damages caused by sparks from locomotives under the common law principle, whether or not negligence was shown. The provision proposed was, however, modified into the following, which has also been included in most of the provincial Railway Acts:

'Whenever damage is caused to crops, lands, fences, plantations or buildings and their contents by a fire started by a railway locomotive, the company making use of such locomotive, whether guilty of negligence or not, shall be liable for such damage and may be sued for the recovery of the amount of such damage in any court of competent jurisdiction: provided that if it be shown that the company has used modern and efficient appliances and has not otherwise been guilty of any negligence, the total amount of compensation recoverable in respect of any one or more claims for damage from a fire or fires started by the same locomotive and upon the same occasion shall not exceed five thousand dollars.'

The company was also given an insurable interest in property along its route.

While this section does not expressly include forests and timber, damages have been obtained under it for timber and cordwood destroyed, so that it may be considered as sufficiently comprehensive though it would be better if made clearer on this point.

While the railways are a great public convenience, there does not seem to be any valid reason why they should not be subject to the common law in regard to damages in all particulars the same as any other company. It has been decided by the courts that the Dominion Parliament has authority to make enactments in regard to railways acting under Dominion charters, even in matters affecting property and civil rights, which, under other circumstances, would be wholly in provincial jurisdiction. If the Dominion statute withdraws these railways from the common law it would seem only right that the Dominion Parliament should supply the defect through its own jurisdiction.

It may be added that the Railway Commission has decided that it has no jurisdiction in damage suits.

Penalties.

It is expressly provided in the Railway Act that the imposition of penalties does not affect claims for damages. As has been noted previously, the penalties for infractions of the regulations of the Railway Commission in regard to equipment and inspection of locomotives and the quality of fuel are fixed by the Board at twenty-five

dollars as against the company and at fifteen dollars as against the employee. These penalties are fixed under authority given the Board to provide penalties for offences against the regulations in cases where not already provided for in the Act, but not to exceed one hundred dollars. These penalties seem small, but if rigorously enforced under a close system of inspection may be sufficient as a deterrent, which is the object desired.

Where the regulations of the Commission do not provide penalty, as, for instance, in case of failure of the company to clear its right of way of combustible material, section 427 of the Railway Act will probably apply. This provides for a penalty of not less than twenty dollars and not more than five thousand dollars for any contravention of, or failure to comply with, the provisions of the Act or regulations by the company or any person acting for or employed by the company, and is intended to cover any case not otherwise provided for in the Act.

The burning of ties or the clearing of the right of way by fire at a dangerous time are not covered by the Railway Act or the regulations, and apparently would not be covered by any penalty.

There is room for improvement of the Act in the matter of penalties, as well as of damages, to make the penalties sufficient as a deterrent and to make them cover all possible items of danger.

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