

& expenses of the ships would be dealt with separately from those of the railway, & this information the shareholders would have in the future. They had, however, always regarded the working of the railway & of the steamers as having one common result in every way. The directors had absolutely nothing to conceal from the proprietors. Mr. Ronald stated that the unfavourable result of the past year's working was entirely owing to the steamer competition, but the directors were absolutely convinced that this must be continued, unless an arrangement could be come to; & the expenses that might be incurred must be regarded as necessary in order to create a goodwill. The railway itself was worked very cheaply. The motion was adopted, & after the re-election of the directors, all of whom retired, a resolution was passed adopting by-laws as altered to meet the requirements of the Dominion Government, which, it was stated, desired to assimilate as far as possible the by-laws & regulations of the several Canadian railways.

Ventilation of Passenger Cars.

The drawing on this page shows the general plan of the Pennsylvania R.R. system of ventilation of passenger cars. It follows somewhat the principle of the old Spear stove system of car heating. Fresh air is taken in through a hood or intake at diagonally opposite corners of the car, allowing it to pass through a conduit underneath the floor of the car into the space bounded by the outside sill, the first intermediate sill & the floor & false bottom—this space extending the whole length of the car. From this space the air passes up through apertures in the floor into heater boxes situated alongside the rock plank, where it is warmed, & from which it passes out underneath every seat into the body of the car, & thence passes up through the globe ventilators in the deck to the outside air.

The handle directly above the instruction card, as shown on the left-hand section, controls an ordinary damper of the butterfly-valve type, which is either set open or set shut. The hood contains inside of it a flat valve hinged at the top, which is operated by a horizontal shaft below, protruding through the side of the box towards the centre of the car.

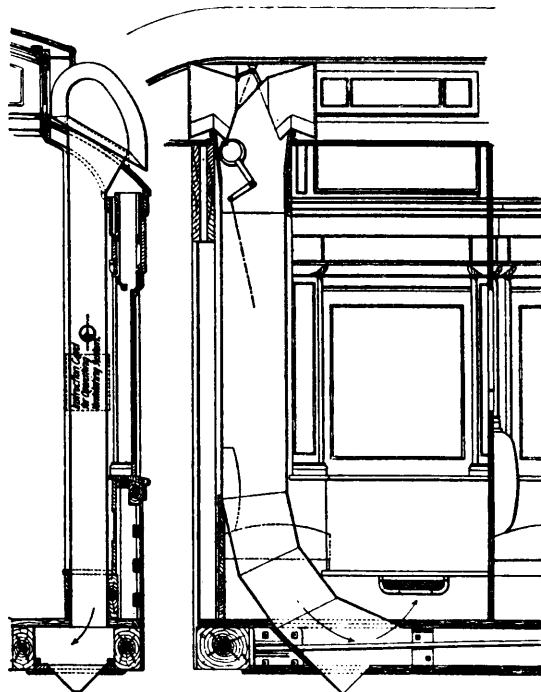
The instructions for operating the ventilating system are simple. In both corners of the car, the upper lever on the instruction box controls the flap valves in the hood & must always point in the direction in which the car is moving. The lower lever on this box must normally be kept "open." This lever controls the admission of air to the car & must only be moved to "shut" position when it is necessary to exclude foul or cold air. The instruction card also contains directions for regulating the globe ventilators at the top of the car.

Early in the consideration of the question of the ventilation of passenger cars, the engineers of the Pennsylvania R.R. were convinced that it should be worked out in connection with that of heating the car, & the system now in use is the result of a careful study of the problem of passing through a car during all seasons of the year a sufficient quantity of fresh air to maintain a wholesome atmosphere for, say, 60 persons, keeping the car comfortably warmed in winter & free from smoke, cinders & dust at all times.

It is generally agreed that perfect ventilation requires 3,000 cu. ft. of air for each person an hour, which for 60 persons would amount to 180,000 cu. ft. an hour. It is impracticable to pass such a quantity of properly warmed air through a passenger car, & it was

not attempted. The calculations were made on the basis of 90,000 cu. ft. of air a car per hour, but this amount could not be properly warmed. After careful study & many experiments for the purpose of determining the correct number, size & location of the intakes, the openings for admitting the air to the heating system, & the ventilators in the deck, in order to secure the proper balance between their respective capacities to take in air, to warm it, & to remove it positive analyses show that good results are being obtained & that a car with the present system receives & rejects about 60,000 cu. ft. of air an hour. The system operates very satisfactorily when the car is standing as well as when it is in motion.

For nearly a year, the Pennsylvania R.R. has had under constant observation cars equipped with this system, & during the most extreme cold of last winter it was found that with all the ventilating apparatus open, it was quite possible to keep the car warm. During the warm weather when there was no heat on the cars, it was found that the cars fitted with this system were better ventilated than the cars that did not have it.—Railroad Gazette.



VENTILATION OF PASSENGER CARS ON THE PENNSYLVANIA R.R.

Amendments to the Railway Act.

The bill introduced in the House of Commons by the Minister of Railways to amend the general Railway Act is of such importance that its provisions are given in full as follows:

1. The Railway Act, chap. 29 of the statutes of 1888, is amended by inserting after sec. 6 the following sec.:

"6A. Street railways & tramways, while hereby expressly declared to be subject to such of the provisions of this Act as are referred to in sec. 4, shall not by reason only of the fact of crossing or connecting with one or other of the lines of railway mentioned in section 306 be taken or considered to be works for the general advantage of Canada, nor to be subject to any other of the provisions of this Act."

2. The said section 6A shall also apply to all electric railways (as distinguished from electric street railways) passing through or over the Queen Victoria Niagara Falls Park, or through or over the property of the prov-

ince of Ontario lying upon or along the Niagara River & known as the Chain Reserve.

2. The said Act is further amended by inserting after section 25 the following sections:

"25A. In case it appears to the Railway Committee expedient or necessary for the public convenience that a station should be located at any point on any railway subject to the legislative authority of the Parliament of Canada, & subsidized in money or in land under the authority of an Act of that Parliament, the Committee may by its order, confirmed by the Governor in Council, direct the company for the time being owning or operating such railway to erect, maintain & operate a station at such point, & may define the facilities or accommodation to be provided by the company in connection therewith.

"2. In the case of a railway not subject to the legislative authority of the Parliament of Canada, but subsidized in money or in land under the authority of an Act of that Parliament, the payment & acceptance of such subsidy shall be taken to be subject to the covenant or condition (whether expressed or not in any agreement relating to such subsidy) that the company for the time being owning or operating such railway shall, when thereto directed by order of the Railway Committee, confirmed by the Governor in Council, erect, maintain & operate a station, with such accommodation or facilities in connection therewith as are defined by the Committee, at such point or points on the railway as are designated in such order.

"25B. The Railway Committee may, from time to time, make rules & regulations, not inconsistent with this Act, for the operating of all or any of the railways now or hereafter subject to the legislative authority of the Parliament of Canada, & such rules & regulations shall supersede all rules & regulations made by the company operating any of such railways in so far as they differ therefrom.

"2. Such rules & regulations shall be subject to the approval of the Governor in Council, & shall be published in the "Canada Gazette" for _____ weeks.

"3. The Railway Committee may, from time to time, appoint competent persons to advise or assist the Committee in the preparation or revision of any of such rules or regulations, or any other matter coming before the Committee; & any person so appointed may be paid out of the unappropriated funds in the hands of the Receiver General."

3. The said Act is further amended by inserting after section 89 the following section:

"89A. Whenever a company, constructing or operating a line of railway which is situate wholly within the limits of one province, & with respect to which, or any part of which, the Government of such province has previously granted & paid a subsidy to such company or any other company, fails to comply with the requirements of its charter as regards the commencement or completion of its work within the times therein specified, or fails, for a longer period than ten days, to continue in an efficient manner the running, operating, or working of its railway, or any part thereof, the Lieutenant Governor in Council of such province, upon the report of the Railway Committee of the Executive Council thereof, may, at any time (even though the company is incorporated by the Parliament of Canada, or the railway is otherwise within the legislative authority of such Parliament), authorize the Commissioner of Public Works of such province, or other proper officer therein, to cause the railway, the road bed, & all the rolling stock & equipment thereof, to be sequestrated or sold.

"2. All proceedings to be had after the granting of authority for sequestration or