

FIRES OF THE MONTH.

August 1st. Electric light plant, Wolfville, N.S.; damage, \$8,000.—August 14th. Monty's planing mill, Roxton Pond, near Granby, Que.; damage, \$15,000; insurance, \$4,500.—August 14th. Monson & Boright's saw-mill, Magog, Quebec; damages, \$5,000, insurance, \$1,000.—August 14th. James Robson & Son's tannery, Oshawa, Ont.; loss, \$4,500.—August 18th. St. Ferdinand d'Hallifax, Que., convent of the Sisters of Charity; damage, \$50,000.—August 20th. Ontario Box Co., Hamilton, Ont.; damage, \$40,000.—August 24th. Scarfe & Co., Brantford, varnish factory; damaged slightly.—September 5th. Power house of the Niagara Falls Park & River Railway; loss on plant, \$75,000; building, \$10,000.

THE ASPHALT BLOCK.

BY C. BAILLAIRGE, C.E.

The new asphalt block pavement, so-called, is new to Canada, though known and used in a few places in the United States for some time. It is now being laid along the Grande Allee, or St. Louis road, Quebec, extending from the Gate to De Salaberry street, a run of 3,700 feet; and the width being 47 feet from curb to curb. The area, including crossings, will be some 20,000 yards, which at 25 bricks to the yard (the blocks being 12 x 4 x 4 inches), will require half a million blocks. The writer was not slow to recommend their use; as, before he ever heard of them, he had urged on the city council in his yearly reports, an addition of grit or crushed quartz to the powdered rock asphalt, to suit it to grades where the ordinary sheet asphalt would be dangerous. An English engineer named Livingstone had also, after an exhaustive visit to United States, reported favorably on the use of the asphalt block; his report appearing at length in *The London Surveyor*, an engineering journal highly thought of by the profession.

The asphalt block we are using is made at Hastings on the Hudson, some 30 miles from New York, by the Hastings Paving Company, 66 Broad street, New York. The block or brick, as it may be called, is made up of some 87 to 90 per cent. of crushed quartz, granite or trap rock, reduced to the consistency of coarse sand or fine gravel, in a matrix or binding mixture of Trinidad asphalt, heated to a temperature of 250° to 300° F the two thoroughly mixed and forced into and out of steel moulds several inches in thickness to stand the stress, under a pressure of 5,000 lbs. to the square inch. This statement is exact, the writer having visited the company's premises and witnessed the process; while he also saw the paving being laid by the company at 183rd street, New York.

There is no doubt but what the mixture of gritty matter with the asphalt or bitumen is the only thing capable of rendering the material suitable to certain grades of roadway. A portion of 183rd street, New York, falling towards the Hudson, has a grade of nearly 1 in 7 or 8, and will, I believe, prove to be too abrupt a one for such material; granite setts being better adapted to such inclines as in Mountain, Palace, Canotterie, Dambourges and Genevieve street hills, Quebec. Neither is the scoria brick suited to such slopes, as witness the upper portion of Mountain Hill, Quebec, where against the written opinion of the city engineer, they were laid, instead of continuing the stone paving to the north side of the electric railway track, at the corner of the postoffice and presbytery, where the outer rail at curve had to be laid to grade of inner rail at least, and should be even higher to guard against derailment by centrifugal action.

The paving on Grande Allee is laid on a bed of sand about half an inch thick or more, overlying a foundation of 4 inches of concrete. This is laid on the old bottom on which the tamarack blocks were laid some 12 years ago. This foundation is composed of two thicknesses of inch boards at right angles, each to the other. The boards are still in a sound state of preservation, as wood generally remains when removed from atmospheric influences, and especially when in or under water, or in wet or moist soils; while wood laid in dry sand or loam does not endure beyond a few years comparatively. I should have preferred, nevertheless, having the wood removed and replaced by so much concrete; but the extra cost would have been some 25 to 30 cents a yard or more, and reasons of economy

prevailed, as it was held that the boards having already stood good for twelve years would hold out indefinitely; timber underlying old macadam having been taken up in other parts of the city, which had been there for over 50 years, and still as sound and clear of discoloration as the day it was laid.

The 4-inch concrete, as stated, was laid direct on the wooden flooring, where the height of the electric track allowed of no intermediate material, but where the rails are laid at a higher level to rectify grade of roadway, the concrete is laid on a 2 to 3 inch bed of broken stone—that is, of the old macadam picked from between the tracks and rails and spread over the boards, after removal of the old wooden block pavement—the portion thereof occupied by the tracks having been taken up two years ago, when they were laid, and the levelling made up of broken stone.

And just here it may be well to state with regard to the life of a wooden pavement of round tamarack blocks, that while that laid on the Grande Allee, twelve years ago, as stated, was found to be in a dilapidated condition from dry rot, blocks are now to be found in the sample room, city engineer's office, city hall, Quebec, which on the occasion of laying water and drainage in Couillard street, were taken up after being there for more than thirty years, and which though worn down by traffic some 2 to 3 inches, or whole height of block reduced from 8 to 6 and 5 inches, were found to be, and are to this day as perfectly sound as when laid some fifty years ago. The reason for this is that the Couillard street blocks were cut and laid green, or with the sap in them, and which under the influence of moisture from rain and the subsoil retained their sap, keeping the wood green and wet, and thus preventing dry rot; whereas, due to the grub epidemic of 1885 to 1889, the worm feeding on the needle of the tree, killed the tamarack, and this sapless wood being used on the Grande Allee instead of the live material, decay set in and dry rot ensued. The life of a wooden pavement is quoted at only seven years, except when creosoted or infiltrated with some antiseptic, while I had in my sample room, already mentioned, specimens of Australian hard woods, "Tallow" wood, "Mahogany," "Blue Gum" and Jarrah, which to test their comparative endurance under similar circumstances of traffic and exposure, were laid in one and the same street at Sydney. They were taken up after being there eleven years, and show only from $\frac{3}{8}$ to $\frac{5}{8}$ of an inch reduction in height during the interval, and are still absolutely sound to the very heart, though slightly discolored.

Returning now to the asphalt block, which may either be laid on a bed of sand overlying the concrete, as stated, or preferably on a coating of half an inch of cement mortar; the blocks are laid close jointed, and are well fed to the layers, at the rate of 10 to 15 yards per man per hour (100 to 150 yards per day of 10 hours), but exclusive of closers along curb stone, which require another man or two to cut them to length and lay. The overlap of the brick as laid in New York is 4 inches ($\frac{1}{3}$ of the whole block), and thus the opposite joints occur at only every third course; but as laid here, the lap is 6 inches ($\frac{1}{2}$ of the block), the joints thus breaking at every second or intermediate course instead of at every third, engineers differing as to which is preferable. The whole is intelligently carried on under the foremanship of — Watson of New Haven, on recommendation to F. Parent, the contractor, by the Hastings Company. The next operation is ramming down, which is done by two men with a heavy beetle (some 90 lbs.), while a third drags a half-inch plate of steel about 10 inches wide and a foot and a half long, thus always embracing more than a brick in length and two in width, and this is moved backwards and forwards along the pavement in a way always to overlap the last portion receiving the impact or the already consolidated surface.

Following this is the sanding of the joints, for though the blocks are said to touch, there are always interstices of 1-16 to $\frac{1}{4}$ of an inch due to roughness of surface, which allows fine dry sand to percolate the joint and fill it. This sand filling was a matter of anxiety to me, as I feared that during rainy weather water might get at the foundation layer of sand and cause the blocks to settle; but no such settlement has occurred anywhere, even after a continuous and heavy two days rain. This non-percolation of surface water into the joints between the bricks I attribute to the bricks' antipathy for water, the oily and greasy nature of the bitumen being antagonistic; or may be water percolates the broader of the joints to a certain depth only, due