

thrown for a distance of more than 1,000 ft., illuminating the tunnel to the smallest detail, & producing the desired effect for a sharp & good negative. The experiments were novel & exciting, as can be imagined—the engine running like a huge bullet through what practically looked like an immense gun barrel, illuminated with a light that could not be faced, & which necessitated the operators & those who took part in the experiments wearing blue glasses, & rushing through this hollow tube at a 30 mile pace. The mutograph or machine used by the biograph company for taking the pictures was placed on the left of the flashlight cabin, the electric motor used for running the machine being connected with 4 storage batteries that were carried on the car. Illustrations of the outfit used & of the interior of the tunnel are given on pgs. 13 & 15.

In connection with the photographing it may be of interest to give the following particulars:—The length of the tunnel proper is 6,205 ft., & of the open portals or approaches, 5,603 ft. additional, or more than 2 miles in all, the largest sub-marine tunnel in the world. It is a continuous iron tube, 19 ft., 10 ins. in diameter, put together in sections as the work of boring proceeded, & finally bolted together, the total weight of the iron aggregating 56,000,000 lbs. The work was commenced in Sep., 1888, & it was opened for freight traffic in Oct., 1891. Passenger trains began running through it Dec. 7, 1891.

The work was begun at both sides, & carried on until the two sections met in mid-river, & with such accuracy that they were in perfect line as they came together. Throughout its entire length it perforates a bed of blue clay, & with the exception of an occasional pocket of quicksand & water, with once in a while a rock or boulder, the clay was the only material met. The borings were made by means of cylindrical steel shields, with cutting edges, driven forward by hydraulic rams, & as fast as the clay was cut away a section of the iron wall of the tunnel was bolted to its fellow section, & thus the wall was completed as the work progressed. The clay overlays a comparatively level bed of rock, & in some places is itself overlaid with a bed of sand. Had the ledges pushed upward into the clay to any extent, or the sand pockets penetrated downward, the work would have been much more difficult. The rails of the track rest upon cross ties only 6 ins. apart, laid on stringers, which in turn rest on a bed of brick & concrete, filling the bottom of the tube.

The engines used to pull the trains through the tunnel & up the steep grades after emerging, are the largest in the world, having 10 driving wheels, & weighing nearly 200,000 lbs. The boilers are 74 ins. in diameter, the fire-boxes are 132½ ins. long & 32½ ins. wide, & the cylinders are 22 ins. in diameter, with 26 ins. stroke.

The cost of the tunnel was \$2,700,000, & when it is understood that 4,000 cars can be daily moved through it, & this is contrasted

with the slow & laborious transfer by ferry, it will readily appear that the enormous expenditure was one which yields profitable returns.

RAILWAY PROJECTS.

Athabasca Central Ry.—C. W. Cross, Solicitor, Edmonton, Alta., gives notice of application to the Dominion Parliament to incorporate a company under this name to construct & operate a railway from Edmonton, on the north side of the North Saskatchewan River, to or near Victoria Settlement, thence to the Athabasca River via Lake La Biche River, thence to or near the mouth of House River, thence to or near the mouth of Clearwater River at or near Fort McMurray, thence to or near the mouth of Tar River, thence to the Red River, thence to or near Vermillion Falls on Peace River, & thence to or near Fort Smith on Slave River; also from or near Fort Smith to or near Fort Churchill on Hudson's Bay or from Black Lake, being the head of navigation of Lake Athabasca, to or near Fort Churchill; also to build & operate a tramway near the Athabasca River from House River to Clearwater River, also near to Peace River in the vicinity of Vermillion Falls, & also near to Slave River at or near Fort Smith, & with other powers.

The Bay of Quinte Ry. Co. gives notice of application to the Dominion Parliament for an act to extend the time for the completion of the main line, extensions & branches, & for other purposes.

Connor Station to St. Charles Jct., etc.—J. X. Straton, Solicitor, Ottawa, gives notice of application to the Dominion Parliament to incorporate a company to construct & operate a railway from Connor Station, N.B., on the St. Francis branch of the Temiscouata Ry., to a point on the I.C.R. at or near St. Charles Jct., or a point on the Quebec Central Ry. at or near St. Anselme, or a point on the G.T.R. at or near Chaudiere Jct., Que., & with other powers.

Crow Lake Ry. & Development Co.—Teetzel, Harrison & Lewis, Solicitors, Hamilton, give notice of application to the Ontario Legislature to incorporate a company under this name to construct a railway from White Fish Bay, Lake of the Woods, easterly to Crow Lake, and with other powers.

The Kingston & Pembroke Ry. Co. gives notice of application to the Dominion Parliament for authority to extend its line from Renfrew, Ont., across the Ottawa River to Bryson, Que., & thence northward to the eastern branch of the Ottawa River.

Kitimat Arm to Hazelton, etc.—Wilson & Senkler, Solicitors, Vancouver, give notice of application to the Dominion Parliament to incorporate a company to build & operate a railway from Douglas Channel at or near the head of Kitimat Arm, in the Coast District of B.C., thence by way of the mouth of Copper River, the Kitsalas Canyon & the Skeena River, to or

near Hazelton, Cassiar; thence by way of Babine, Manson & Parsnip rivers, or other feasible route, to Pine River Pass, Cariboo; or, as a partially alternative route, from or near Kitsalas Canyon to Bulkley Valley, & thence following the valley of the Bulkley River to Hazelton; & also to build & operate railways from the nearest or most available point on the route of the aforementioned railway, southerly & easterly by way of the Stuart Lakes, or other convenient route, to or near Fort George, thence along the valley of the Fraser river to Quesnelle, Cariboo; & also from or near Fort George or the Stuart Lakes, by way of the south fork of the Fraser River, Cariboo, to the Yellowhead Pass, Alberta, with power to extend the railway from Kitimat Arm along the northerly side of Douglas Channel to or near Hartley Bay, & with other powers.

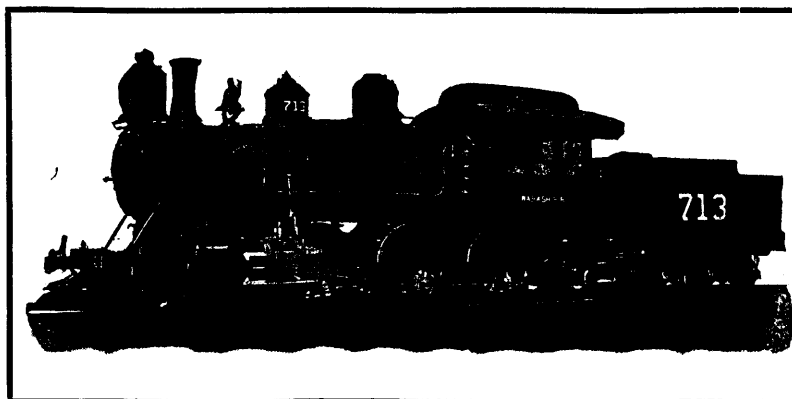
Lake Bennet to Hootalinqua River.—D. G. Macdonell, Solicitor, Vancouver, gives notice of application to the Dominion Parliament to incorporate a company to construct a railway from the west side of Lake Bennet, Yukon, to Lake Laberge & thence to the mouth of the Hootalinqua River at its junction with the Lewes River, to own & navigate vessels & with other powers.

Lindsay, Bobcaygeon & Pontypool Ry.—At the same time as the municipal elections were held recently by-laws granting bonuses to this enterprise were voted on & carried as follows:—Township of Harvey \$3,000, Village of Bobcaygeon \$11,000, Township of Verulam \$14,000, Township of Ops \$15,000, Town of Lindsay \$25,000, Township of Manvers \$5,000. In the township of Cartwright the municipal elections having been by acclamation only a small vote was polled, though there was a considerable majority for the by-law, & an investigation is now being made to see if the necessary aggregate number of votes was polled. The municipalities mentioned above are all through which the proposed line would pass, & as they have all granted aid it is expected that the Co. will now proceed to finance the undertaking, & to make arrangements for starting construction. (Dec., '99, pg. 359.)

The Montreal & Ottawa Ry. Co. gives notice of application to the Dominion Parliament for an Act extending the time within which it may complete its railway & connect it with the C.P.R. in Ottawa, & for other purposes.

Morris & Portage Railway Co.—T. L. Metcalfe, Solicitor, Winnipeg, gives notice of application to the Dominion Parliament to incorporate a company under this name, to build & operate a railway telegraph from or near Morris, Man., to or near Portage la Prairie, & with other powers.

The Napierville Jct. Ry. Co. gives notice of application to the Quebec Legislature to amend its charter, by giving it the option to construct its line between a point in the Parish of St. Constant & a point in the Parish of La-ccolle, at or near Rouse's Point.



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