

& a half from the summit the line enters the loop on Carrol Creek, & winds up along the south side hill for $\frac{3}{4}$ of a mile. Very heavy rock cuts & fills are encountered. The line then crosses Carrol Creek on a $12^{\circ} 30'$ curve, the angle of the curve being $228^{\circ} 110$ ft. Standard trestle is used here with a 150-ft. span. The cuts on both sides of the crossing are very heavy; 76,000 cubic yards of rock on the south side, 55,000 on north side. The line follows down the north side of Carrol Creek, & swings around on a 12° curve, & follows the valley of Kid Creek once more. Heavy cuts & fills are encountered. Kid Creek runs into Goat River, & the line follows down the west side hill of Goat River. The heavy work continues, & Goat River Canyon is reached. Very heavy cuts are met with; two especially heavy ones, one on each side of the crossing, 62,000 & 53,000. The river is crossed with a single span 200 ft. long, at a height of 165 ft. above the river bed. The walls of the canyon are solid rock, & nearly perpendicular.

The approaches of the bridge were all in readiness for the span, & as soon as the rails arrived at the bridge, work commenced at once on the span, it being brought along on the construction train. The span was completed in eleven days.

The line now follows down the east side of the valley, & passes on the right of Duck Lake. Duck Creek is crossed with a trestle & 70-ft. span. The work along the lake is heavy, rock cuts being the main feature. Another branch of Duck Creek is crossed with a span, & the work is heavy till the Kootenay River is again reached, after its wanderings in Montana and Idaho. The river comes out on what is known as Kootenay Flats, & is divided into 3 branches. To cross this flat $4\frac{1}{4}$ miles of trestlework were necessary, with 3 bridges, with 3, 2 & 4 spans respectively, &

1 steel arch swing bridge of 200-ft. span. Temporary bents were driven, & the piles for the abutments; then stringers were strung across. These bents on the trestlework appeared to be much higher than they need be; this is on account of the height to which the water rises; at high water Kootenay Lake rises 38 ft.

The work ceases at the end of this trestle, but the charter and contract extends to Nelson, the Co. having 2 years' time from Oct., 1898, to build this in. The work around the west side of Kootenay Lake & the Narrows is the heaviest work on the line, being solid rock, & will cost on an average \$35,000 a mile. The distance is 53 miles. There is a transfer slip, which is used to transfer the cars from the line to the boats; this is very long, owing to the great height to which the water rises on Kootenay Lake. Barges are used to carry the cars across the lake; these are towed by the steamer. The cost of the road was heavy. The first 100 miles cost, on an average, about \$14,000, the second 100 about \$13,000, & the third 100 about \$19,000 a mile.

The foregoing paper was read by Mr. Davidson before the Engineering Society of the School of Practical Science, Toronto, by the kind permission of the officers of which it is here produced.

Surveys, Construction, Betterment, &c.

The Atlantic & Lake Superior Ry.'s large bridge at Bonaventure has collapsed, & traffic is suspended.

No information is forthcoming as to what, if any, construction work will be done this year.

Brandon & Southwestern.—It is said the promoters recently made application to the Manitoba Government for the usual Provincial aid of \$1,750 a mile for this line, between

Brandon & the International boundary. It is possible a grant may be given for a portion of the distance, probably that lying south of the Northern Pacific's Souris River branch, but it is hardly likely that the whole line will be bonused, as the feeling seems to be that there is no pressing necessity for the northern portion of the line. The promoters are reported to have stated that the Dominion Government has promised \$3,200 a mile, subject to the ratification of Parliament this session. It is not known who are behind the figurehead promoters, but the general impression is that they are backed by the Great Northern (U.S.A.) which has a branch to Bottineau, N.D., within about 12 miles of the International Boundary, & near to the southern point to which the B. & S. W. is projected. (Jan., pg. 11.)

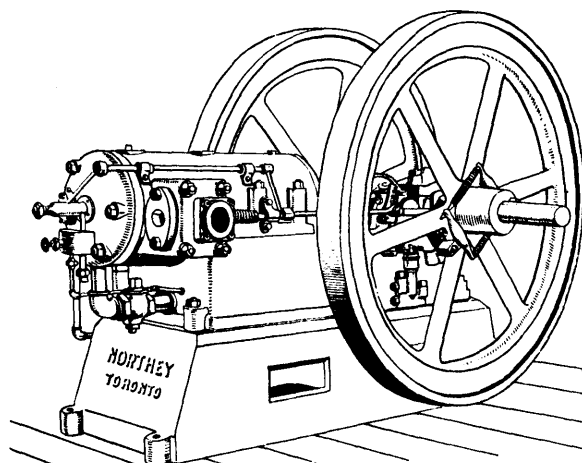
Canada Atlantic.—The trestle work at Arnprior is to be filled up to track level.

Canadian Northern.—It is expected that the portion of this line from Cowan, the end of last year's construction, to the Saskatchewan River, will be put under contract almost at once, & that that distance will be completed this year. (April, pg. 115.)

Central Ontario.—At the recent session of the Ontario Legislature this Co. was granted a cash subsidy of \$3,000 a mile for 21 miles, to assist it in extending from Ormsby, 5 miles from its northern terminus at Coe Hill. Whether the extension will be gone on with this year depends on the action of the Dominion Parliament as to granting a Dominion subsidy. If this be given, we are informed the Co. will immediately start to extend from Ormsby via Bancroft to either Barry's Bay or Whitney, on the Canada Atlantic Ry. The distance from Ormsby to Barry's Bay would be about 60 miles, & to Whitney about 75. Bancroft is about 20 miles from Ormsby, & it is not likely work would be carried beyond there this year.

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