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CONTENTS OF THIS NUMBER :

The articles now running in the Canadian Engineer on the Electrical Power Developments of Canada, will be reprinted in book form, with diagrams and folding plates. Price $5.00 per copy Advance orders received.

Subscribers who intend binding the last volume of The Canadian Engineer, and who require a copy of the index, will please advise us at once.

THE CASCADE WATER, POWER AND LIGHT CO., CASCADE, B.C., CANADA.

BY W. G. MCCONNON, C.E.

All of the gold extracted from water is not taken directly in the form of metal. A power-house for generating electricity proves a very efficient "stamp mill" for delivering "concentrates" in the form of volts. That this is appreciated by mining men is evidenced by the recently completed plant of the Cascade Water, Power and Light Company, situated at Cascade, B.C., and owned by the London and British Columbia Goldfields Co., Limited, representing an investment, in round numbers, of $500,000.

Cascade is a small town on the Kettle river, twelve miles east of the town of Grand Forks, and about thirty miles directly west from Rossland, B.C. Flowing from the west, the Kettle river descends 120 feet in passing through a half mile of narrow, rocky gorge in a series of rapids and falls. For the utilization of this natural power, the Cascade Water, Power and Light Company has built a large dam, waterway, pipe line, power-house, and transmission line from Cascade to Phoenix, where the largest and most productive copper mines in the "Boundary District" are situated. The dam, placed just above the entrance to the gorge, is of timber cribwork, with a 40-ft. base and 24-ft. top. The mid-section is 50-ft. high, tapering to 25-ft. at the sides, while the total length is 400-ft. This is built on a solid rock-bed to which the foundation timbers are bolted, and filled with 10,000 cubic yards of rock. This dam raises the water 36-ft. above the natural level, giving an effective head at low water of 156-ft. The permanent water level is 10-ft. below the top of the dam, being controlled during high water by twelve sluiceways, which can be opened to 12-ft. below the natural river level, giving a passway of about 2,000 square feet. These sluices are closed by means of 12-in. by 12-in. squared timbers in grooves, operated by a travelling winch running on a track over the top of the dam. From dam to power-house the water first passes through a 225-ft. open rock cut from which it enters a tunnel driven through 410-ft. of solid rock, passing under the track of the Canadian Pacific Railway, and then into another open rock cut 500-ft. in length, at the end of which the bulkheads and controlling gates are located. These cuts and tunnel, representing an excavation of about 35,000 cubic yards of rock, are of dimensions liberal enough to avoid any appreciable loss of head, delivering the water with a head almost equal to that at the dam level. From the gates the water is conveyed through a wooden pipe, 7-ft. in diameter, for about 1,400-ft. This pipe is constructed of Oregon fir-tongued and grooved staves, 2¾-in. by 7-in. cut in circular segments and machined to the radius of the pipe. The staves are hooped at 12-in. intervals, with ¾-inch round steel bands, with cast iron connecting shoes for clamping. Provisions have been made at the bulkhead and in the width of the cut shown in the first illustration for the installation of a similar additional pipe. From the stave pipe the water is carried through 250-ft. of circular steel pipe, 7-ft. diameter, resting on concrete piers and anchored into solid rock to avoid end thrust. Where this pipe passes alongside of the power house, three 4-ft. pipes and one 2-ft. pipe are taken off below the floor level of the power-house to supply three 36-inch turbines for generators and two 12-inch turbines for exciters.

Engraving No. 2 is a general view of the power-house showing the stand-pipe at the junction of the stave and steel pipes. This stand-pipe relieves the pipe line from excessive water-ram strains, and incidentally voids any air taken into the pipes. About