THE BOUNDARY CREEK DISTRICT.

THE TOWN OF GRAND FORKS AND THE GRANBY SMELTER.

THE Granby smelter, which is now nearing completion, was located on its present site, owing to the exceptional water power in the vicinity. To utilize this power a dam 175 feet across the top, 75 feet from heel to toe at the bottom, and constructed of sawn timbers 12x12 inches and filled in rock was thrown across the north fork of the Kettle River and a flume 11x9 feet and a mile long constructed to carry the water to the works, the grade being 0.01 inches to every 33⅓ feet. At extreme low water this stream will furnish 1,200 horse-power, and the smelter will use, under actual head of 45 feet, 15,000 miners' inches after deducting friction and all losses. The dam will afford about 30 feet of this head, the rest being made up between the dam and the power wheel. The value of this water power to the Granby smelter is very apparent. Steam power, it is estimated, costs in the mining districts from $125 to $150 per horse-power per annum; electrical power in Rossland is supplied at a cost of $60 per horse-power per annum. The latter, it is understood, was offered to the Granby smelter company, by the West Kootenay Power and Light Company, of Bonnington Falls, for $75 per horse-power per annum. But the smelter company can, by generating its own power, effect a considerable saving over any offer from an outside source, for beyond the initial expense of installation, the present system will be no longer a charge beyond the cost of maintenance and repairs. It is estimated that the saving as compared with steam will be from $25,000 to $75,000 per annum, according to the amount of power used, which at the start should not exceed 350 horse-power. Of the works themselves the following is a very excellent account by Mr. C. A. Bramble, at present with the Canadian contingent in South Africa, but formerly a correspondent of the MINING RECORD residing at Columbia and practising as an assayer and metallurgist:

A spur track two and a-half miles in length, with a very easy grade, runs from the main line a short distance above Columbia, to the north end of the works. The power house is within 1,000 feet of the smelter buildings, and about 100 feet below them. There is ample room at the smelter site proper for as large a plant as the company will ever care to put up, and there is ample dumping room for years to come. The main power with which the blowers, sampling works, etc., will be given is to be given by a duplicate set of 16-in. turbine wheels, operating, as before mentioned, under an effective head of 45 feet. This will develop 250 horse-power net. These are mounted in pairs on horizontal shafts and are cased in a steel flume mounted on I beams. These wheels are connected with the flume by a steel intake pipe 4 feet 7 inches in diameter and discharging into a single draft chest and draft tube, 16 feet long, set at 45 degrees downward inclination.

The wheel used is the New American, made by the Dayton Globe Iron Works. One of the greatest advantages of this wheel is that it works at its greatest efficiency when the gates are three-quarters open. These two pairs of turbines are each directly connected with one Westinghouse rotating arm, alternating-current generator, having a capacity of 180 kilowatts, 250 volts, the full lode efficiency being 93.5 per cent. A section of the power house is shown in the accompanying drawing.

The foregoing description applies to the main power battery. During the day all will be in use, running at three-quarters capacity, but they are so arranged that one battery will run the works at night, hence giving an opportunity every evening to overhaul one battery. By this arrangement they are practically equal to duplicate engines. There is also in the same power house a single 10-in. turbine wheel, developing 40 horse-power net. This is directly connected with one Westinghouse 4-pole lighting generator of 22.5 kilowatts capacity, 125 volts. This is for lighting the entire plant, and is self-contained. Moreover, when the works are running, and it is necessary to shut down for repairs, or in case the large power battery is not running, the works would still be lit. It was considered better engineering to have the lighting plant separate from the power generator.

There will also be in the same power house one single 13-in. horizontal turbine wheel, which will develop 55 horse-power. This wheel is belted to a Stillwell-Bierce & Smith-Vale Company triplex pump, of the double-action type, having a guaranteed capacity of 750,000 gallons each 24 hours, against a maximum pressure of 100 lbs. to the square inch, or against a 200-foot head. This pump will furnish water and pressure to granulate the slag, as it runs continuously from the furnaces.

There is also in the same power house one equal to the first mentioned, namely, 16-in. wheels, to supply extra power should such be required. The power house is 100 feet long by 30 feet wide, and all the batteries are set in line, on one long concrete foundation. The end of the flume enters at one end, of the building, about 35 feet above the centre of the wheel, the water being tapped out of the side of the prospective water wheels.

The smelter proper consists of two double-decked, steel-jacketed furnaces, 160 by 44 in. The total height of the furnaces from the charge to the furnace is 14 feet. The jackets come within 18 in. of the charge floor. The heights of the lower set of jackets is 7 ft. 6 in., and that of the upper set 2 ft. 6 in. The furnace has a continuous flow water jacket and bronze slag spout. The tuyeres are 5 in. in diameter and 9 in number. The lower side of the furnace has 3 water jackets on the side and one on each end, while the upper jackets number two on the side and one on each end.

The bottom of the furnace is of the moveable type, and the brickwork is supported by a cast-iron bedplate, mounted on eight wheels, and is raised and lowered by 8 jack screws built in the wheel frames. The tuyeres are made of cast-iron at the furnace end, connecting with the blast-pipe through 6-in. boiler tubes, which are joined to the cast-iron end by air-tight expansion joints. All jackets are hung from the wrought-iron I beams, which are supported in turn by the cast-iron deck-plates resting on the columns.

On each side, and in the centre of the furnace, are small-water-cooled tapping jackets, for tapping out when the furnace is blown out. The furnace. above the feed floor, is of brick, bound with suitable buckstays, and there is a charging door on each side of the furnace, opening the entire length, and about 2 feet high.

The gases pass off from the top, in a 4-in. diameter take-down pipe, which is connected with the big flue-