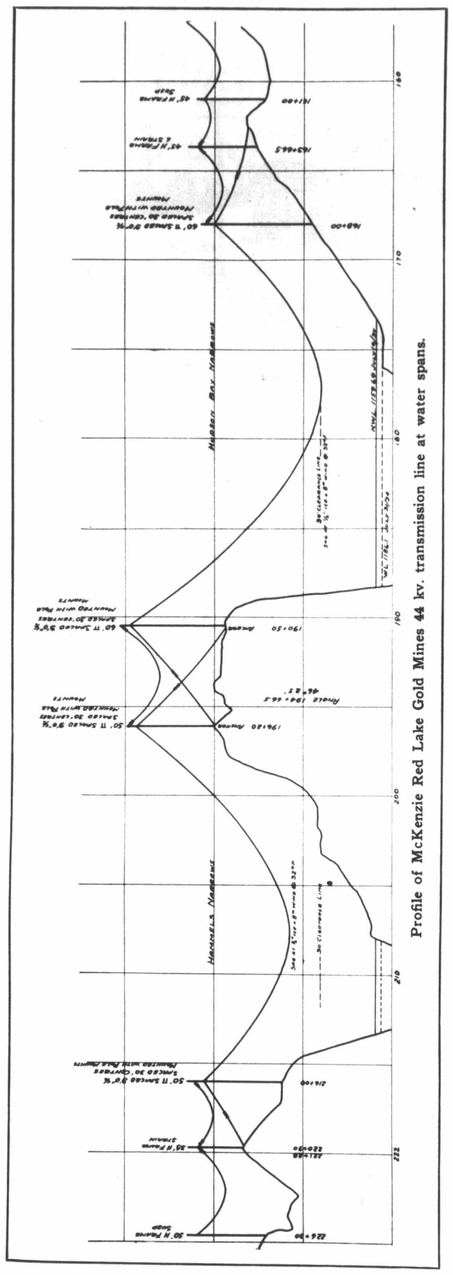

Profile of McKenzie Red Lake Gold Mines 44 kv. transmission line at water spans.

the downward resultant of the tension. The suspension clamps used were Line & Cable Accessories open side type.

The cable dead ending clamps were attached to both ends of each cable by means of an hydraulic press before they left the factory which was made possible due to the type of construction used.

Each cable was dead ended by means of two strings of 5 C.P. 2610 insulators assembled with yokes, the ultimate strength of the assembly being 40,000 lb. This assembly was cut into the conductor at a point to give sufficient clearance above the ground and attached to three anchors with turnbuckles by means of three high strength steel guy cables. The structures are spaced 30 ft. centres and at points where rock was encountered the poles were set by means of Williams pole mounts.

On the long spans special means were taken to limit vibration. Reinforcing rods were used at each suspension point and in addition loops of wire were attached to the conductor on each side of the suspension clamp. Loops of wire were also attached at each strain point just ahead of the dead end insulator assembly and the assembly itself was designed to give a maximum of flexibility so as to avoid a hammer blow. All bolts on the structures were equipped with Palnuts to prevent loosening under vibration.

Practically all line hardware was of N. Slater & Co. manufacture supplied by the Northern Electric Company.

Substation Equipment

The step-down equipment consists of three single-phase, 60 cycle Ferranti 40°C transformers, 44 kv. to 575 volts equipped on the high side with four 2½% full capacity reduced voltage taps. These transformers are protected by means of Ferranti surge absorbers and controlled by means of a 3-pole gang operated air break switch and fuses. The transformers and surge absorbers were purchased through the Northern Electric Company and the switch from the Eastern Power Devices Limited.

The low-tension switching equipment consists of four panels. On panel No. 1 is mounted the following: 3—a.c. ammeters; 1—a.c. voltmeter; 1—frequency meter; 1—power-factor indicator; 1—a.c. indicating wattmeter; 1—polyphase integrating watthour meter, and 1—3-pole s.t. automatic hand operated 1200 amp. oil switch with under voltage release equipped for a time delay of two seconds.

Each of the three remaining panels have mounted thereon: 2—400 ampere Westinghouse Nofuz air circuit-breakers. These breakers, while very compact and capable of being mounted in a very small space, have exceptionally high rupturing capacity.

Two circuits were run to the mill, two to the hoist and compressor house and one to the pump house at the lake. Where conductors of 500,000 c.m. were indicated two 4/0 circuits were run instead on account of the ease of handling.

Fuses were not used in connection with the power or lighting panels. Nofuz panels were used throughout. The mill lighting circuits are controlled by means of one 18 circuit panel and the mill power circuits are controlled by means of three Amelco Nofuz panels as follows:

Panel No. 1: 2—100 amp., 575 volt, 3-phase circuits; 1—50 amp., 575 volt, 3-phase circuit; 1—25

(Continued on page 53)

New Hoist Control at the Beattie Gold Mines

By E. PUXON,
Engineer, Canadian Westinghouse Co.

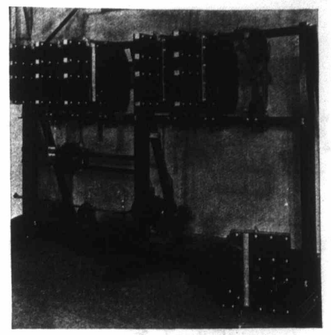

Fig. 1—Primary reversing contactor panel.

BEATTIE Gold Mines, located near Noranda, Que., are now installing a double cylindrical drum ore hoist. The depth of the shaft is at present 1,800 ft. and with a load of 12,000 pounds per trip the total tonnage per hour will amount to 150 tons. This hoist is driven by a 500 hp., 2,300 volt, 3-phase, 25 cycle, wound rotor induction motor with full magnetic control.

Plans have been made for an extension of the shaft to a depth of 3,000 ft. on completion of which a duplicate 500 hp. motor will be installed on the hoist. With 1,000 hp. the tonnage per hour will be the same as for the original installation, as the speed of the hoist will be increased in proportion.

The circuit to the hoist is controlled by a type BH oil circuit-breaker and the primary of the motor is protected by a type F-22 breaker with overload and no-voltage release.

These breakers as well as the primary contactors, will not be changed when the second motor is installed as they are of suitable capacity to control the two 500 hp. motors. Suitable protection is afforded by the use of double ratio current transformers to give protection to either one or two 500 hp. motors.

Fig. 1 shows the primary reversing contactor panel, the contactors of which are rated at 500 amperes, 2,500 volts, and these are pneumatically operated by means of a small electrically controlled valve. Safety devices are provided to open these contactors should air pressure become too low. The arc incident upon opening is directed along heavy arcing horns by strong blow out coils and is confined by substantial barriers. The arcing horns are shown on the contactor at the extreme right which has had the barriers removed to show operating parts.

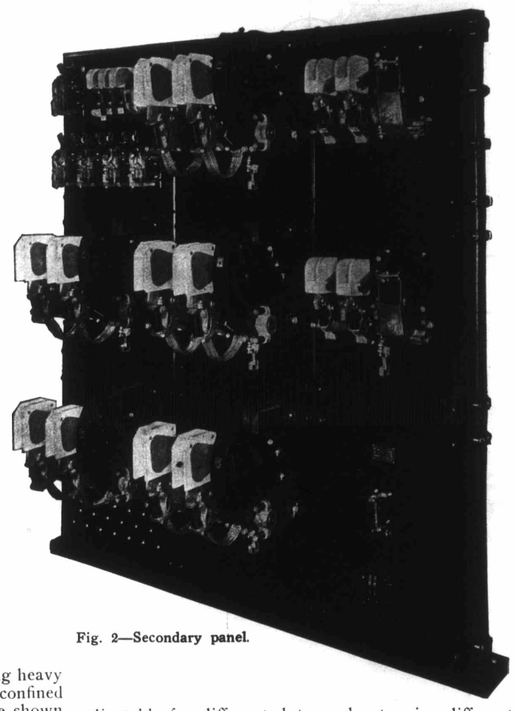

Fig. 2—Secondary panel.

Fig. 2 shows the secondary panel having five 600 ampere and two 300 ampere secondary contactors for the control of the wound rotor motor secondary which are used for accelerating and decelerating the hoist motor together with their associated control relays and interlocks. Time limit relays are used in conjunction with the accelerating relays to prevent undue acceleration of the motor and these relays are adjustable for different duty cycles to give different accelerating periods.

An interesting feature of this control is the use of a special relay which prevents the hoist being started when the total load taken is close to the allowable peak load. At the same time this relay will allow a hoisting cycle to be completed under these circumstances. An eight point forward and reverse master switch is used for controlling the motor, which, together with an ammeter for the operator's guidance, is mounted on the operator's platform.