pick up the lifting arms then drop them. Two small links between the wrist plate and bell crank do away with springs, dash pots, latches, and cams, making a positively-driven valve gear which may be operated at high speed.

A LARGE ELECTRIC HOIST.

During the first week of November the directors of the North Butte Mining Company, in a meeting at Duluth, voted to award to the Westinghouse Electric & Manufacturing Company, the contract for what will be the largest electric hoist in the two American continents, and one of the largest of its kind in the world. The hoisting drums, which will be 12 ft. in diameter, will be driven by a direct connected electric motor running at a speed of about 71 revolutions per minute. Power will be supplied to this motor from a motor generator set equipped with a 50-ton flywheel to secure elimination of the peaks that would be drawn from the power line during period of starting and acceleration.

Hoisting with this equipment will be done in balance, but the equipment is large enough to take care of unbalanced hoistings. Skips will be used for handling the ore and each skip will have a capacity of 7 tons of ore. Round rope 1⅝-in. in diameter will be used and the equipment is designed for a normal rope speed of 2,700 ft. per minute with a maximum of 3,000 ft. per minute. The capacity of the hoist will permit 300 tons per hour being hoisted from the 2,000 ft. level or 200 tons per hour from the 4,000 ft. level.

The system of control and power equalization used will be that commonly known as the Ilgner System, in which a flywheel driven by the motor generator set is permitted to give up some of its stored energy to supply the peak load drawn by the hoisting motor. In order to reduce the flywheel losses to a minimum, the flywheel will be encased in a smoothly finished steel housing and provided with special type of self-lubricating bearings.

The hoisting motor will be of the type used in steel mills and will be of a very heavy construction. In fact, all of the equipment has been designed with absolute reliability as the paramount consideration. The electrical equipment alone will weigh in excess of 250 tons. A number of special safety devices are included in the equipment, including electrically released brakes; automatic slow-down devices to prevent skip or cage ever going through head sheaves and a special controller to limit the speed when hoisting men.

The hoist motor will have a maximum intermittent rating of 4,500 h.p. and the motor generator set will be driven by an induction motor having a continuous normal rating of 1,400 h.p. The difference between these ratings represents approximately the amount of energy that will be supplied by the flywheel momentarily during starting. The installation is so designed that the draft of power from the power line will be practically constant throughout any cycle of hoisting.

This Granite Mountain Hoist of the North Butte Mining Company will be the largest electric hoist anywhere in the Western Hemisphere, and will be one of the largest using the Ilgner System of power equalization installed anywhere in the world. There are larger electric hoists in South Africa, a few of which use the Ilgner system of power equalization, but most of these South African hoists do not attempt to obtain power equalization.

HOLLINGER.

The report of Hollinger Gold Mines, Ltd., for four weeks ending November 4, 1913, says, in part:

Gross profits for the four weeks amounted to $124,995.11. There was hoisted 13,210 tons ore, and 1,153 tons waste rock. The average value of the ore hoisted was $15.04 per ton. The total cost of mining was $5,055 per ton

The mill ran 95 per cent. of the possible running time, treating 13,401 tons, of which 310 tons were treated for the Acme Gold Mines, Limited. The average value of Hollinger ore treated was $15.07 per ton; approximate extraction 96.1 per cent.; milling cost $1,407 per ton.

The total cost of $5.05 per ton shows a reduction from previous results. It is well for shareholders to remember that this cost includes all development, shaft sinking, timbering and other dead work. If this development cost were carried as a deferred charge to be distributed over all ore developed or made available, the total working cost would be reduced by some 70 or 80 cents. That is to say, our actual cost for mining, milling and general charges amounts to about $4.25 per ton, but we consider it advisable at present to burden operations with the cost of work from which future benefits will be derived.

Satisfactory developments have continued in the mine. Drifting has amounted to 484 ft. The winze below the 425-ft. level had reached a depth of 22 ft. upon November 4th. The vein is 8 ft. wide and carries $17.00 per ton at the bottom of the winze.

COBALT ORE SHIPMENTS.

The bullion shipments for the week ending Dec. 5th were:

	Bars	Ounces	Value
Nipissing	140	165,651.73	$96,192.15
Townsite	14	10,780.00	6,144.00
Penn. Can.	10	8,096.00	4,695.00
	164	184,527.73	$107,331.15

The ore shipments for the week ending Dec. 12 were:

	High.	Low.	Pounds.
La Rose	68,000	100,000	168,000
McKinley-Darragh	60,810	.....	60,810
Beaver	109,780	.....	109,780
Timiskaming	87,220	.....	87,220
O'Brien	82,210	.....	82,210
Cobalt Townsite	82,810	.....	82,810
Right of Way	86,800	.....	86,800
Cobalt Comet	66,200	.....	66,200
Penn. Canadian	65,580	.....	65,580
	709,410	100,000	809,410

The bullion shipments for the week ending Dec. 12 were:

	Bars.	Ounces.	Value.
Nipissing	112	131,850.79	$76,903.08
Dom. Reduction	62	70,112.00	42,600.00
Crown Reserve	58	65,189.00	37,809.00
	232	267,161.79	$157,212.08