From this Table the following deductions may be made:—

Daily	Saving effected on output of 1,000 tons			$ 1,587.50
Monthly (25 days)	"	"	"	39,687.50
Yearly (300 days)	"	"	"	476,250.00

In connecction with the installation of the hoisting and haulage plants above described, various accessory facilities, including railway spurs, have been constructed, which have materially cheapened the costs of realization that have previously prevailed. A general description of some of these follow, but the economies effected are not given, as the main object of the paper is to describe the new system of hoisting and haulage at the Le Roi mine and the economies effected by it, as compared with the old system.

Carpenter Shop and Framing Shed.—Here all the mine timbers are delivered from the railway cars, aud are framed to square sets by machine saws, of which there are two sets, each complete in itself. The high line spur of the railway is on a level with this plant, so that the timbers roll directly from the cars to the framing saws. When framed the timbers are loaded on the timber trucks, run through the Black Bear tunnel to the station at the combination shaft, there loaded on the cages and lowered to the different levels in the mine. The mining timbers are thus handled and framed in a most economical manner, and a very material saving is effected on the cost of wagon haulage and hand labor by which this work was formerly done.

Blacksmith and Machine Shops.—These adjoin each other, and are furnished with modern designs of forges, power hammers, lathes, shears and the general equipment necessary for the repairs and maintenance of a plant of this character. The forges and machinery for these shops, as well as for the carpenter shop and framing shed, are run by compressed air or steam. These shops are on a level with the railway, and all supplies used are delivered directly from the railway cars.

Powder Magazine.—A new fire-proof powder magazine has been built of stone and brick, alongside the high line spur that passes the portal of the Black Bear tunnel, blacksmith shops, etc., at a convenient though reasonably safe distance from the works.

Thawing House.—On the same track, and midway between the Black Bear tunnel and the powder magazine, a thawing house, equipped with steam heat, has been built. This is reached by the mine cars, which carry the thawed powder directly to the Black Bear station in the combination shaft, from which it is sent to the various levels as required. These arrangements do away with the cartage and consequent risk incidental to the extra handling of the powder, the importance of which will be recognized when it is known that the amount used daily in the mine approximates 2,000 pounds.

Water Supply and Fire Protection Systems.—A complete system of water supply for the machinery and for protection against fire has been installed, and, as a consequence, a very material reduction in the rates of insurance has been effected. The systems are a combination of the gravity and pumping systems, each supplementing the other. The gravity system operates under a head of 300 feet, and the pumping is done by two Standard Underwriter's pumps having a capacity of 500 gallons per minute each against a 400-ft. head.

The arrangement of these systems, which includes 31 hydrants strategetically located around the various buildings, is such that a very efficient fire service can be maintained with very little cost to the company, and the safety of the plant from fire may be considered assured if ordinary precautions are taken.

On the completion of this plant, the insurance companies made a reduction of 40 per cent. in the premiums previously paid for insurance.

The construction of the entire plant as above described was not finished until the month of May, 1901, although many of its units had been completed and utilized in the mining operations several months before. Owing to the industrial activity that prevailed during the period of construction, it was almost impossible to close a contract for the delivery of machinery of any considerable size short of nine or ten months from date of signing contract. This and other factors prolonged the time occupied in construction to double what would have been sufficient under favorable conditions.

The working of the completed plant was successul from the start, and the results shown in the preceding tables have been taken from actual operations.

Smelting Plant.—The enlargement of this plant had kept pace with the facilities provided at the mine for the increased extraction of ore, and in the month of May five furnaces, having a total capacity of 1,250 tons per day, were erected. The sixth furnace was on the ground ready to erect, which would have brought the total daily capacity of the smelter up to about 1,500 tons.

For the purposes of this paper it will not be necessary to give a description of the smelting plant, except to mention its increased capacity and the facilities afforded for handling the increased output of the mine. In the installation of the mining and smelting plants, great care was exercised in the choice of such machinery as was best adapted for the work to be done, while every portion of the plant was constructed with a view of obtaining the highest possible efficiency and economy in operation at the lowest cost.

The saving effected in the hoisting and haulage operations of this plant is worthy of the attention of mining engineers, for, as shown in Table V, this alone would make a very considerable profit on the mining operations, if conducted on a large scale.

All the cost of installation of the mining and smelting plants, and the purchase of Breen's quarter interest in the smelter was paid from the profits of the mining operation for the eighteen months ended June 30th, 1901, besides leaving a balance of $135,132.79 unencumbered product at the smelter.

The following statement, Table VI, shows the cost of these plants, and hence the profits earned during the period named:

TABLE VI.

Smelter—		
Cost of James Breen's smelting contract and one-quarter interest in smelter	$300,000 00	
Cost of interest paid on this amount	10,785 75	
" New smelter additions and handling facilities	185,442 00	
The total cost of the smelting plant		$496,227 75
Mine—		
Cost of 1,125 feet combination shaft, mine development and exploration	$292,426 40	
Cost of new mining machinery	210,086 05	
" " buildings enclosing the plants	99,381 13	
" underground machinery and equipment	64,453 45	
The total cost of mine development, machinery and equipment		666,277 03
The total cost of mining and smelting plants		$1,162,504 78
On hand at smelter, ore and furnace products, unencumbered as security to Bank		135,132 79
The total net earnings for eighteen months		$1,297,637 57

Economies Effected.—As indicating the extent to which the costs of realization of the gross values in the ore may be reduced under full operations of the new mining and smelting plants, Table VII, giving the costs for the fiscal year ended June 30th, 1901, follows:—

TABLE VII.

Mining—		
Stoping	$3.362	per ton
Exploration	.138	"
Equipment	.094	"
Depreciation of buildings	.030	"
Depreciation of machinery	.106	"
Freight on ores	.510	"
		$4.420 per ton.