

# Cleveland-Cliffs Iron Co.

*by Dave Johnson*



*14K gold 25 year service pin from C.C.I. Co.*

The Marquette Iron Range in Michigan's Upper Peninsula was the first and northernmost of the three iron ranges in the state to be developed. The Gogebic and Menominee Ranges lie further south and straddle the Michigan/Wisconsin border. It was on the Marquette Iron Range that the Cleveland-Cliffs Iron Co. was to develop and later expand to other iron ranges and states to become one of the nation's largest independent iron ore producers.

The vast deposits of the Marquette Iron Range were first tapped by the Jackson Mining Co., organized July 23, 1845. Rather than ship ore to the eastern furnaces, the Jackson Mining Co. set up their own furnace and forge and proceeded to produce their own iron bloom for shipment East in 1847. While initially a financial failure this venture, in the long run, demonstrated the quality of the Michigan ore.

The Marquette Iron Co. followed the Jackson and Cleveland Iron Mining Companies and began mining operations in 1849, with their own furnace and forge to process the raw ore into iron blooms on site. Due to the remoteness of the area and lack of transportation it cost \$200 per ton to mine, process and deliver a ton of iron to Pittsburgh, where the market price in 1849 was only \$80 per ton. The company continued to operate at a loss until 1853.

The Cleveland Iron Mining Co. organized on November 9, 1847 and was granted a state charter on April 2, 1850. Actual incorporation occurred in 1853. On May 18, 1853, the Cleveland Iron Mining Co. took over the operation of the Marquette Iron Co. through a stock transfer. The Cleveland Co. worked the existing Marquette properties and began expanding their holdings. They too discovered that transportation was the obstacle to be overcome in order to turn a profit on the high quality Marquette Range ore.

Transportation costs began at the mine when the ore went from the mine to the stockpile, from the stockpile to the furnace and forge, from the forge to the dock and from the dock to the eastern market. It would take two advances in transportation to make this ore profitable, the completion

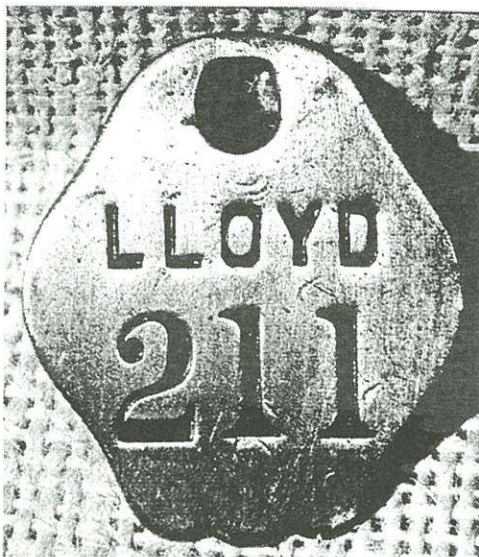
of the first locks at Sault St. Marie in 1855 and the use of railroads to transport ore to the docks.

Another relatively early, and eminently influential, mining company on the Marquette Range was The Iron Cliffs Co. Headed by Samuel Tilden as president and director, it was formed in 1864 and entered the iron mining business with the purchase of 38,000 acres of mineral land in Marquette County that same year. Tilden served as Governor of New York and was the Democratic candidate for President in 1876, losing to Republican Rutherford B. Hayes. By 1889 The Iron Cliffs Co. owned 53,350 acres of mineral land and operated such successful Marquette iron mines as the Barnum, **Empire (see tag right)**, Foster, Holmes, Ogden, Salisbury and Tilden, as well as the huge iron deposit at the Cliffs Shaft in nearby Ishpeming.



*Check tag from C.C.I. Co.  
Empire mine.*

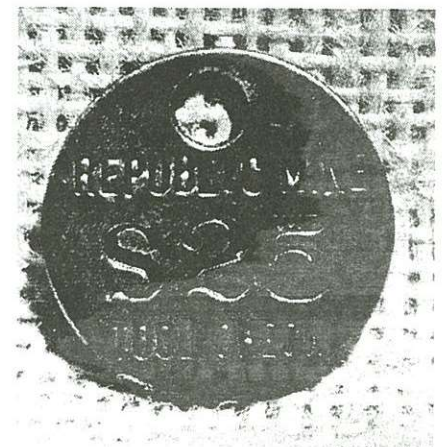
In 1891 the Cleveland Iron Mining Co. and the Iron Cliffs Co. merged to form the Cleveland-Cliffs Iron Co., with William Gwinn Mather as president. Mather was the son of Samuel L. Mather, president of the Cleveland Iron Mining Co. who died in 1890. Following the merger the new firm acquired the Lake Superior Iron Co., the Arctic Iron Co., the Regent Iron Co. and the Imperial Mine at Michigamme.



*Check tag from C.C.I.Co.  
Lloyd mine.*

Looking toward long-range future mining operations, Cleveland-Cliffs began purchasing additional mining properties in 1902. They leased the Crosby Mine on Minnesota's Mesabi Iron Range and bought the Maas property near Negaunee, where they opened the Maas and Negaunee Mines. The Jackson Mine was added to their holdings in 1905. They opened the Athens Mine in 1905 as well. The Morris and **Lloyd Mines (see tag right)** were opened west of Ishpeming in 1907.

Seeking new properties, in 1902, Cleveland-Cliffs started exploratory drilling 18 miles south of Marquette in what was to become known as the Gwinn District of the Marquette Range. This exploration led to the opening



*Check tag from C.C.I.Co.  
Republic mine.*

of the Austin, Francis, Gwinn, Gardner Mackinaw, and Stephenson Mines. The nearby Princeton Mine was acquired in 1905.

**The Republic Mine (see tag right)**, opened in 1870, was purchased by Cleveland-Cliffs in 1914 and operated until its ore reserves were exhausted in 1928.

Between 1919 and 1933, Cleveland-Cliffs began operation of several more mines on the Mesabi Range in Minnesota, these included the Canisteo, Hawkins, Holman-Cliffs and Hill-Trumbull Mines. These operations did away with the old rail system for hauling ore from the open pit to the washing plant and replaced it with a truck and conveyor belt system.

Begun in 1940, the **Mather A Mine (see tag right)** was sunk on an iron deposit that went 4,000 feet below the surface. The Mather B began development in 1947 and by 1949 was working at a depth of 3,100 feet.

The Cleveland-Cliffs took over operation of Republic Steel's sole mine on the Marquette Range, the Cambria Jackson Mine, near Negaunee, in 1943.

In addition to its iron mines, Cleveland-Cliffs formed a Coal Department and began acquiring coal property in 1919. By 1948, Cleveland-Cliff coal mines in West Virginia were producing more than 5,000,000 tons of coal per year. This product allowed for up bound paying cargoes for Cleveland-Cliff ore freighters which previously had to return in ballast after dropping their ore at the down lakes market.

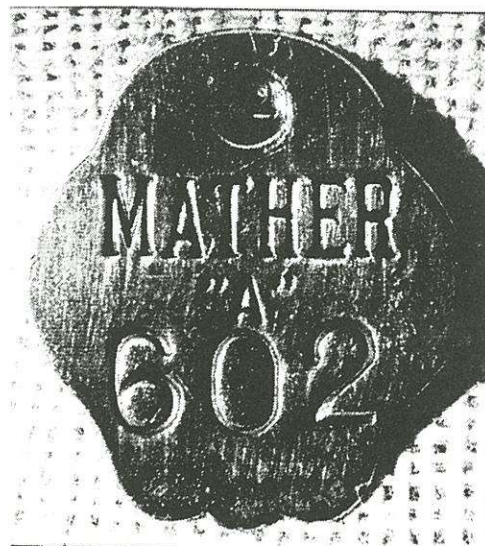
Cleveland-Cliffs had been in the ore shipping business since 1872 when the Cleveland Iron Mining Co. acquired controlling interest in the Cleveland Transportation Co., which operated a fleet of Great Lakes schooners and steamers. The Cleveland-Cliffs Co., as did other large iron producers, found that operating their own ore carrying fleet removed them from the vagaries of the competitive shipping market.

The same is true of their interest in railroads to move their ore from the mines to the docks. The Cleveland Iron Mining Co. built a railroad from its mines to its ore loading dock in Marquette in 1857. This first ore hauling railroad had the ability to carry 1,200 tons daily from the mines to the docks.

By 1896 the Cleveland-Cliffs Co. had expanded their railroad to the point where it had 400 rail dump cars and a total of 14 steam locomotives. The Munising Railway was purchased in 1900, along with 84,000 acres of hardwood timber lands. By 1903 there were 102 miles of mainline and a total of 262 miles, including all branch and spur tracks to the mines. By 1949 rolling stock consisted of 30 steam locomotives, three diesel locomotives and 2,620 ore and timber cars, all maintained with a 20 stall engine house and repair shop.

Both the Cleveland Iron Mining Co. and the Iron Cliffs Co. had been acquiring timber acreage along with their mineral lands. The wood was first used for charcoal production and shoring timbers in the mines. Cleveland-Cliffs used the by-products from their charcoal furnace operations in an allied chemical industry as early as 1890. Cleveland Cliffs owned and operated sawmills, a wood veneer plant, and a tannery, as well as chemical plants. All this came from their initial mining operations begun in the 1850's.

As with many Pennsylvania coal and iron companies, with their State sanctioned Coal & Iron Police, the Cleveland-Cliffs Iron Co. had their own police force. This force never gained the



*Check tag from C.C.I.Co.  
Mather "A" mine.*



Badge from C.C.I.Co.

notoriety of the Pennsylvania Coal & Iron Police, due to the absence of serious labor problems.

The first iron mining operations on the Marquette Iron Range were nothing like we envision today. There were no shaft houses, hoist houses, pump houses or other large physical plants.

The first mines consisted of shallow pits worked by a few dozen men. They actually quarried the ore rather than mined it in terms of mining as we think of it today. They hand drilled for blasting charges, broke the large chunks of ore with sledge hammers to proper sizes, hand loaded the ore onto two wheel dump carts, and hauled it to stockpiles. Until 1857 all the ore was hauled by horse or mule drawn wagon to the furnace. After 1857 small locomotives hauled the ore to the furnace or the

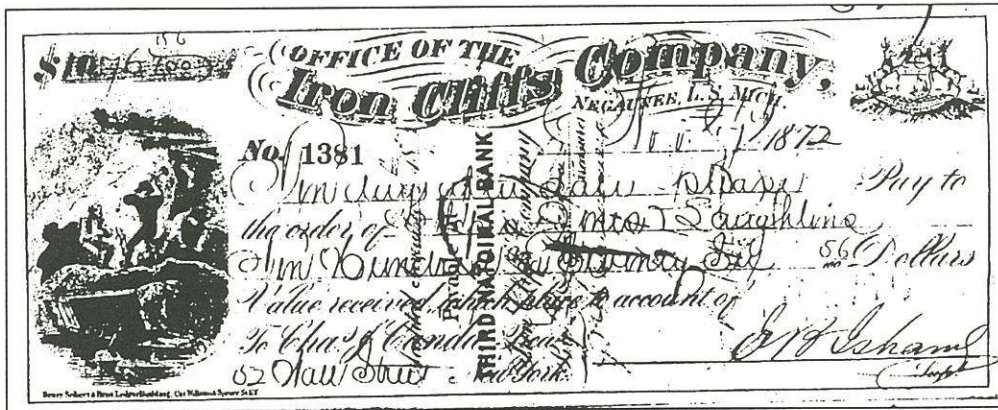
docks. By the time of the Civil War, most ore was shipped to the eastern market for processing rather than being processed on site. Pit mining continued to be the main method of ore extraction through the 1870's and into the 1880's.

As the ore deposits sloped downward it became increasingly difficult to remove overburden without excessive cost. At first the miners merely drove under the overburden as the ore body dipped to greater depth. They built inclined skiproads back to the wall to hoist the ore. By the early 1880's, as more deep ore bodies were discovered by exploratory drilling, the shaft mine era was launched.

The first shafts were sunk directly down into the ore body. This proved to be dangerous and costly when the overlying rock sank down or caved in under the great overhead pressure when the ore was removed and damaged the shafts. The solution to this problem was to drive the shafts down through the rock at the edge of the ore deposit on the footwall side and access the ore through horizontal drifts. This type of mining, unlike the earlier pit mining, required more equipment, which meant a large investment in the physical plant of a mine before ore could be removed.

This method of mining was still comparatively simple. A tunnel, or drift, was drilled horizontally from the vertical shaft into the ore body and large rooms (stopes) were mined out, leaving pillars of ore to hold up the roof. This was known as the "open-stope" method of mining. Unfortunately it wasted much of the ore. In areas where the roof was weak and in soft ore mines the western square-set method of timbering was employed.

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The "caving system" of mining began experimentally in the Cleveland Hematite Mine at Teal Lake when the Cleveland Iron Mining Co. acquired the property in 1881. The property had been worked as an open pit to a depth of 120 feet. When acquired, the company sank two shafts to the ore body. They blocked

the body out into a series of horizontal layers. They first removed the top sublevel, after which they blasted out the timbers, allowing the roof and overburden to cave in under its own weight. They then moved down to the next lower sublevel and repeated the process. The tramway was kept on the next lowest level and as the ore was mined, it was sent down through a chute to waiting tram cars. This method proved to be so successful that it became common mining practice and was used in some Marquette Range mines up to the 1960's. The tram cars were first loaded and pushed by hand. The Cleveland Lake Mine was the first to introduce electric underground haulage, in 1892.

By 1949, approximately 10% of mining was by the top-slicing method, 35% by sublevel caving and sublevel stoping, and 20% by block-caving. For those not familiar with iron mining, a short description of the mining methods may be helpful. Once the vertical shafts are sunk, main tunnels are driven back in the footwall below the ore body. Each tunnel is 100 to 200 feet lower than the one above. From these footwall tunnels crosscuts are driven across the ore body at 150 foot intervals on each main haulage level. From each crosscut, two-compartment openings, known as "raises" are driven upward at a 65 degree angle into the sublevels in the ore body above.

Prior planning, exploration and knowledge of geological features, blocks out the ore body for adaptation of the most suitable mining method. Top-slicing may be chosen to allow for the clean recovery of a small area under flabby cap rock (slate or shale for example) by extracting 12 foot layers one after another, from the top down, each with timbered slicing drifts. This method can be changed to subcaving to reduce timber costs by "slicing" every other layer and caving the ones in between.

If the overlying rock will support itself across a narrow ore body, open sublevel stoping can be employed, allowing for higher per capita production because little or no timber is needed. Finally, block caving can be utilized where ore heights of 100 feet or more are encountered.

As the ore is mined it is moved by an electric scraper (tugger) to the mouth of the raise where it slides down a chute into cars in the crosscut below. The cars are moved by electric locomotive to the shaft where they are automatically dumped and the ore raised to the surface.

Unfortunately the iron mines of the Marquette Iron Range are now only a memory, with some of the more recently worked mines still in evidence through abandoned buildings. For all intents and purposes, Michigan iron mining is a dead industry, the cost of underground mining being too great to compete with the larger open pit operations.