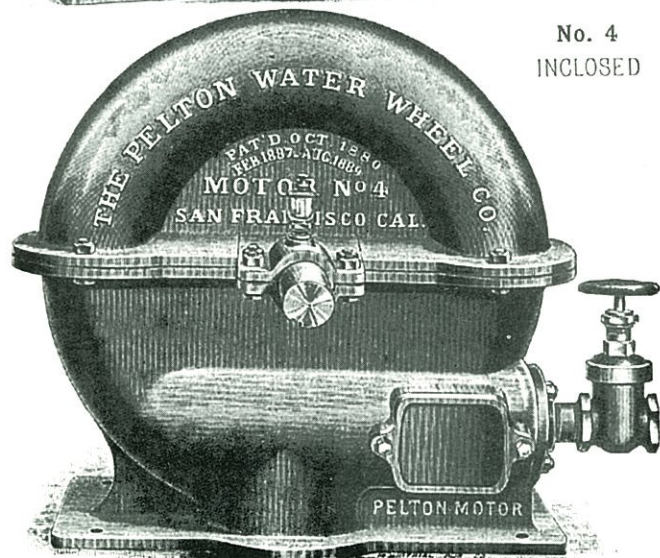
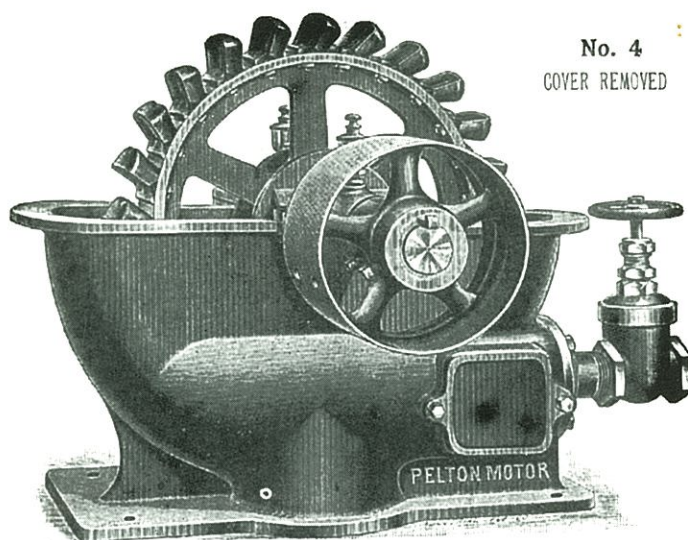


THE MINING COLLECTORS' REVIEW

ISSUE NUMBER 5

FALL 1997



Prospectors Arrastras
The Hardsocg Lamp Score
A Rocky Mountain Mystery
Removing Rust from Iron or Steel

IN THIS ISSUE

The Pelton Water Wheel
Safety Blasting Machines
The Grant Candle Company
Cerro Gordo, A Search for Water Pt. 2

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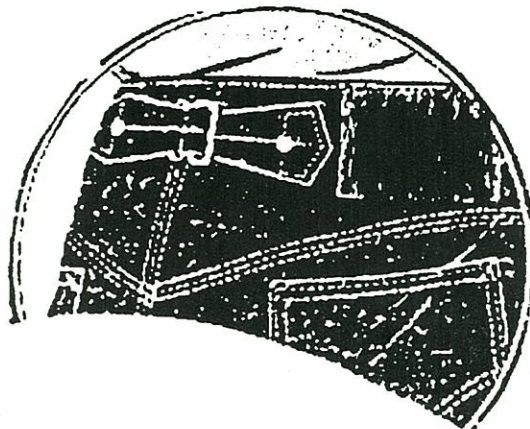
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REVIEW OF MINING



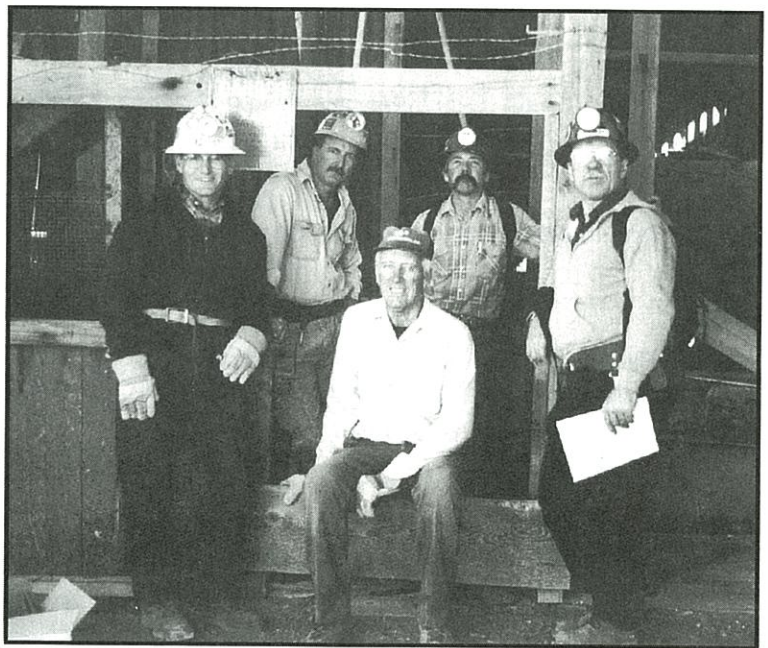
Editorial

The 'Review' was delayed in publication due to a need to change the editorial organization and spread some of the duties around.

Having done this, we will attempt to stay on schedule and continue to improve the content and format. We continue to solicit articles, photos and information that may be of interest to our readers.

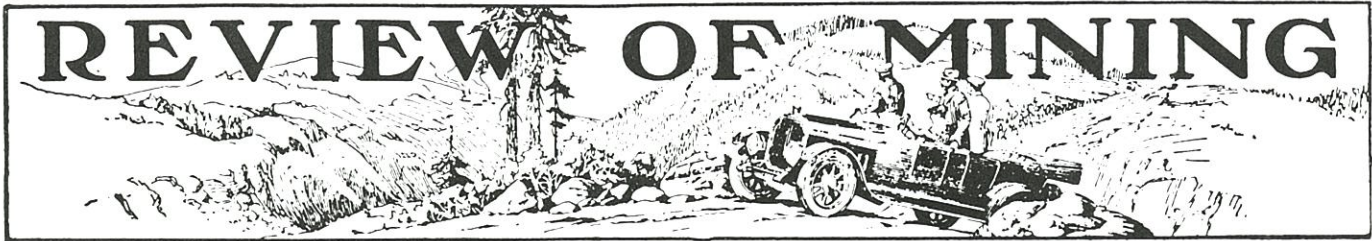
I had the opportunity to visit the Cerro Gordo property last month at the invitation of Steve Rush and Leo Stambaugh. This gave me additional insight into the details of Steve's article and their efforts to access the shaft and obtain water for the property owners. Jody Stewart was our gracious host, providing authentic lodging at the old bunkhouse and a great steak dinner at the old hotel. This is truly a wonderful place for a mining historian or artifact collector.

The Cerro Gordo Mines would be an excellent destination for a day or a weekend and could easily host an artifact related gathering. Maybe the California collectors will organize something in the future. For additional information contact: Jody Stewart, Cerro Gordo Mines, Rt. 1 Box 5, Swansea, Lone Pine, California 93545.

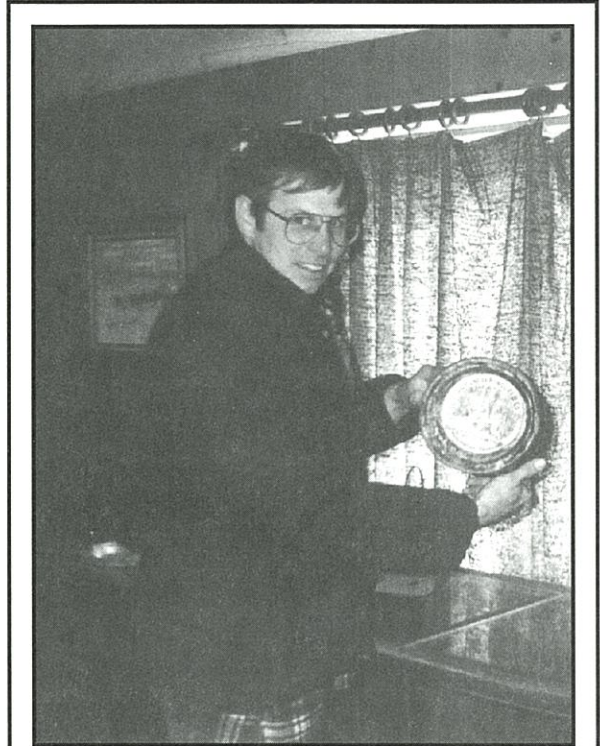


THE CREW at the collar of the Belshaw Shaft, Cerro Gordo. From left to right — Lane Griffin, Brian Schrage, Frank the Hoistman, Steve Rush and Leo Stambaugh — October 1997.

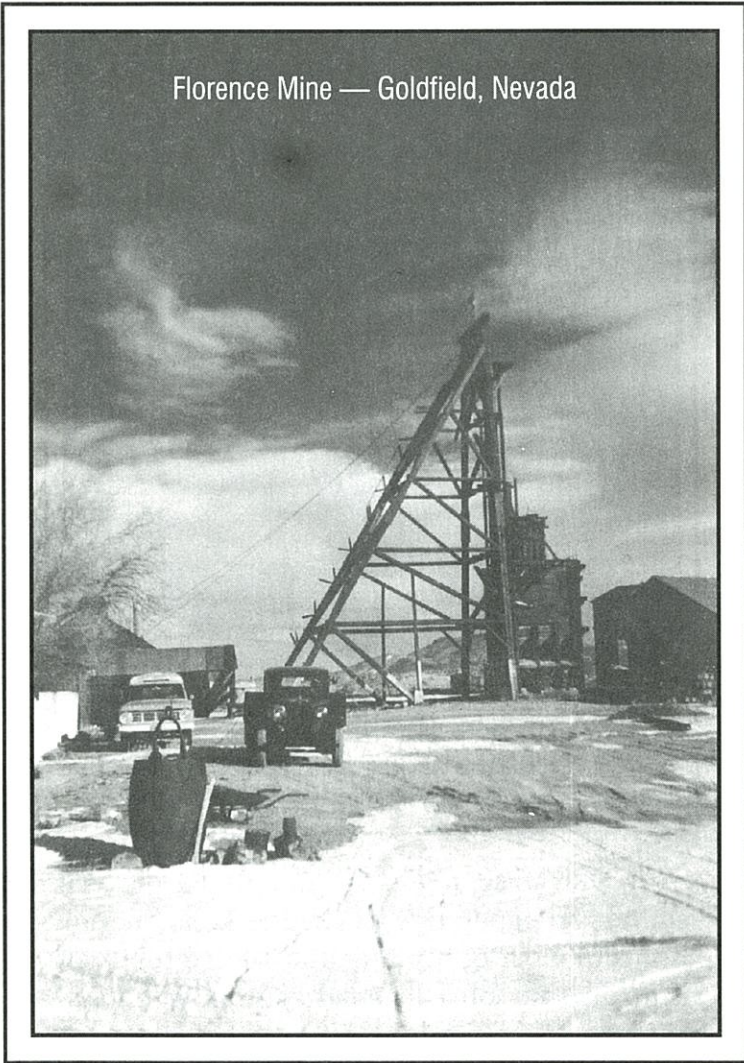
REVIEW OF MINING



I recently had the opportunity to meet Jon Aurich and he graciously toured me around his restoration activities in Goldfield, Nevada. He has purchased the Goldfield Consolidated building in 'downtown' Goldfield and has begun a most ambitious rehabilitation effort at the site where Wingfield and Nixon made mining history and millions of dollars. He has also been involved in the maintenance of the Florence mine, which is in a marvelous state of preservation. I will highlight his efforts in subsequent issues of the 'Review', but if you are traveling through central Nevada, give him a call on the weekend at (702) 485-3486. ✕



John Aurich Jr, showing his DuPont black powder barrel.



*From all of us...
to all of you...*

Happy New Year



CERRO GORDO, A SEARCH FOR WATER

Part 2

by Steve Rush

The first time I set eyes on Dave Pruett, he was wearing a near new straw hat, a flannel shirt, and a friendly grin. He arrived in Cerro Gordo the early morning of April 18, looking fresh from his long drive down from Gardnerville, Nevada.

Shaking hands all around, he commented that it was nice to see us all still alive after our adventure with the ladder in the Cerro Gordo shaft the previous evening. Inquiring as to the condition of cable and cage, he glanced around at us youngsters and said "well, let's go on up and take a look."

I have worked at a number of jobs over the last thirty years, for a number of bosses, some good, and some bad. Dave immediately set himself apart from all those bad bosses by taking a walk around the hoist works, crawling up among the timbers of the shaft house where the all important cable ran, and peering into the shaft at the suspended cage, all the while keeping up a running commentary of "boy, that could use such and such, and see that? It could use this."

There were six of us at the Cerro Gordo Mine this early day, and though Dave never gave a direct request for assistance, you never saw such a scramble to help as he made the seemingly offhand statements of what needed doing. Even Roger Peterson broke into a trot to fetch a needed tool from Dave's truck.

Apparently, Dave had given his plan of action a considerable amount of thought, and he wasted no time in showing us how to remove the original drive motor from where it sat beside the immense gears of the Joshua Henny hoist. It was Dave's intent to replace this 150 horse electric motor with an eight horse hydraulic motor. In terms of weight, the ratio was about 1000 pounds of electric motor to about forty pounds of hydraulic motor. Okay...

Remember the television show from the 80's called MacGyver about a mechanical wizard who could spot weld a hydrogen bomb casing with two nickels? Dave quickly acquired the nickname MacGyver as he lined out tools, brought out modern replacement parts for the hoist, and showed us how to align the new motor and reduction gears to integrate with the hundred year old parts still in good working condition.

Fortunately the mine buildings already had power to a modern fuse box, run in the 1970's to power the hoist works for mine exploration. A new line was run from the hydraulic motor to the fuse box, the new motor was aligned in place of the old, and "wallah" (an old mining term) the hoist works was back in operation and ready for men and equipment to begin our exercise to mine not ore, but water.

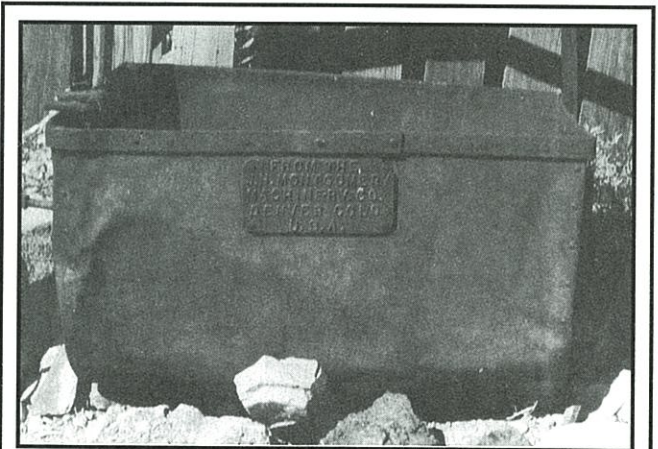


Figure 1. Aerial tramway bucket from the Cerro Gordo Tramway that ran to Keeler, a 15 mile distance. Buckets manufactured by the J.H. Montgomery Machinery Company in Denver.

Of course, it wasn't quite as simple as it sounds on paper. I've worked on construction projects most of my life, and I have to admit that on this job I learned a number of new expletives; singular, plural, and strung

together in recognizable sentences. Rather than go into the intricate difficulties of obtaining power to a hundred year old piece of equipment and getting the cage to simply move from its stops at the shaft collar, suffice it to say that under the expert direction of Dave “MacGyver” Pruet, it was accomplished in one day.

In retrospect, getting the Joshua Hendy hoist rolling again was the simple phase of our water mining project.

As you loyal readers recall from the fall issue and part one of this article, the Cerro Gordo mine shaft is 900 feet in depth. Collectively, that’s 1800 feet worth of wooden cage guide from the shaft collar to the 900 level. We were all to achieve an intimate knowledge of these guides very soon.



Figure 2. Porcelain sign found in the bottom of an out house pit in Cerro Gordo. Tramway hauled ore in buckets from Cerro Gordo to the Smelter in Keeler.

With a ragged cheer among the onlookers Dave fired up the hoist and ran the cage several times up and down the first one hundred feet or so of the shaft. Bringing the cage back up to the collar, he called for volunteers - two of ‘em - to place a realistic weight into play. Roger and I were identified as those among the group with their hands in the air first. Actually, speaking for myself, I was merely scratching the top of my ear, and didn’t even hear the original question of “who’s up for going down first?” This is also how I became vice president at my company during a meeting on management restructuring, but I don’t want to get into that.

Roger’s son, Chad Peterson, nervously posed the question of wouldn’t it be safer to pile the accumulated weight of two men in the cage in the form of rocks or something, but this was waived aside as a needless endeavor. Didn’t we just witness the cage traveling free with not even the slightest hesitation from the hoist mechanism? Laden with hard hats, lights and equipment to work below at the 700, Roger and I took our places in the cage. “Say something historic”, a bystander said. Rogers was “to infinity and beyond” (he apparently has grandkids), and mine was “don’t let us fall” (I apparently was frightened). Brave smiles in place, we collectively nodded to Dave at this position as chief engineer to lower away.

And down we went. All the way to the 110’ mark. Where we stuck fast, hung up within the wooden guides which had gradually resigned to the weight of rock pressure from behind the cribbing, decreasing the shaft width somewhat.

During the process of hanging up in the shaft, a couple feet of cable had become slack, effectively releasing suspended weight from the cage. With a great clatter and clack, the rowled dogs of the cage’s safety apparatus set fast into the wooden guides. I must admit, it gave Roger and I a bit of a start. Well, okay, maybe a step above start.

Roger told me later that his first impression of my face was that I only had one huge eye in a field of white. My impression was that he lunged towards me with a bear hug, blubbering “I really love you, man!”. Both impressions may have been correct.

Once Dave observed a problem (the slack cable being the tip off) he attempted to bring us back up. The safety dogs held tight. With our weight in it, it wasn’t going anywhere. Our first radio communication was a calm, “Houston, we have a problem”. Well, okay, our first communication was a hysteric “what’s going on? Help us! Aghhhhhh!” Dave’s response was calm. He

directed us to move out of the cage onto the manway ladder so that he could release the cage. I must say, the ladder certainly seemed to be in excellent shape, as compared to what it looked like the previous day. Near new, in fact. The cage rose a few feet to our level and we stepped back aboard for the slow ride to the surface.

The apparent problem had occurred over the past several decades and did not affect the entire shaft. At several areas, the 110' level among the first, the guides would need to be lagged back into the cribbing or shaved away with a draw knife to allow free travel of the cage. Dave took this in stride, and spent a bit of time training several of us in the fine art of running the hoist. Frank Purkhart, Cerro Gordo's present watchman par excellence, was chosen as the one least likely to drop anyone.

The next several hours stretched into several days as a crew of two to three men, Dave in the lead, spent time repairing the shaft guides. Dave proved to have ice water in his veins as he showed us the best way to proceed, having a considerable amount of experience in shaft repair. Taking a heavy plank long enough to span the inside of the shaft, he would use this as a platform to work from *below* the suspended cage. Dave would eye where he figured the cage would hang up, then proceed to chisel away the wood, which was as hard as rock — and covered with old grease, until he felt he could get a lag bolt through into the cribbing. This would be tough work standing on level ground; working in limited light below a thousand pound safety cage over a yawning abyss hundreds of feet deep...

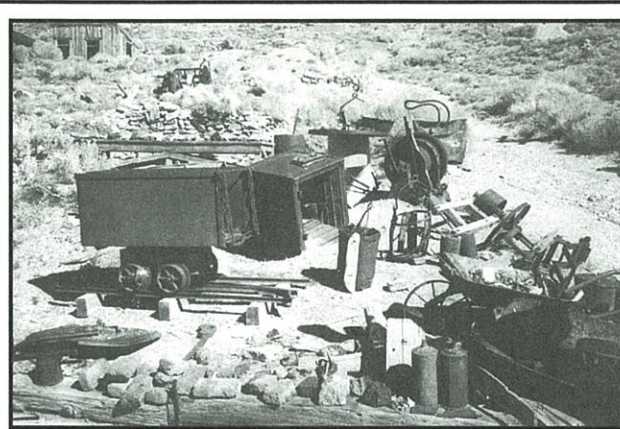


Figure 3. Irish buggy, ore bucket remains, ore car and other iron items from Cerro Gordo's past. Old safe in center once held Cerro Gordo's payroll.

Dave was attached by safety line to the cage, of course, with one of us lackeys crawling about the cage floor handing him tools as called for. Occasionally the cage would still stick going through a repaired spot, requiring Dave to work from the cage roof so as to allow access back up the shaft. This was interesting work, but not something I would want to put on a resume for fear someone would make me do it again.

April 21st was our last day in the mine, the outside world having waited long enough for our return. With the work far from over, shifts would continue with assistance from

Don Becker, Rick Bates, Chris Biedermann, Sean Terry and George Copenhaver.

My return from Colorado on Friday, May 2nd was in the fine company of Leo Stambaugh and Roger Peterson. Work at the Cerro Gordo had progressed to the water source itself in the 700 level, with the cage and hoist works now performing as if there

had been no seventy five year gap in its history.

Dave Pruett arrived on Saturday, the same as the previous three weekends, as one apparently tireless individual with the same friendly grin and his "let's see what's out there" enthusiasm. We immediately descended to the 700 level. Frank Purkhart had, by now, become a first rate hoist engineer, with the patience to remain in his chair in vigilance of his cage charges for as long as we were down below.

The cage still rubbed a bit within the guides, but its travel was no longer impeded as before. Soon we were within the 700 level drift, with the next course of action being the replacement of an ancient two stroke pump



Figure 4. Artifacts from Cerro Gordo's past line the shelves of the old grocery store. Items turn up practically every day to add to this "in-progress" museum.

there since the early 20's. A modern pump had been brought down earlier, time to put our perspective plumbing and electric hats on.

The cistern excavated into the drift floor measures approximately twenty feet by four feet by four feet, holding about 2500 gallons of very clean water. The source appears to be seepage directly from a formation known locally as the Chainman Shale, with a bar ditch carrying the inflow into a cistern. Since the water never flows through tailing piles or adjoining ore bodies, it seems to be as clean (if not a good deal cleaner) than tap water from say, Denver or L.A.

While Leo and Dave poked and prodded the new pump, I set out new water pipe and electric lines. It's easy to forget that you have no peripheral vision working with a cap lamp, so like many a new miner I would turn and bang into a timber or the rib with a comment bursting forth as to how disturbed I was with this every time I did. Leo told me later that he and Dave would have been done sooner with

their work if I hadn't been so distractingly entertaining.

The weekend crew before us had brought down all the supplies necessary, as well as having performed quite a bit of early installation work. It was left up to us to place a submersible pump within the cistern itself, reattach wires and pipe, and flip the switch. Dave had inspected the water pipe and electric conduit which ran down the shaft, not much needed to be done here. This was surprising, since so much junk had obviously been tossed down the shaft by tourists over the years, but no apparent breaks could be seen.

"Stand back", Dave instructed us as he threw the switch. We stood back. An immediate hum from the pump, some movement of parts, and a stir of silt from the cistern showed that we may have accomplished something. We grinned at each other, then turned toward the shaft with consternation as the sound of rhythmically splashing water reached us. A break we'd

missed. Oh well, pump off, repair pipe, pump on and grin again. Read back two sentences and repeat numerous times.

Another problem became apparent upon repairing all breaks. To move water seven hundred foot up a 1" galvanized pipe may require that we revisit high school physics. But, of course Dave had made it into the advanced physics class (heck, he probably taught it) and knew what tweaking was required where.

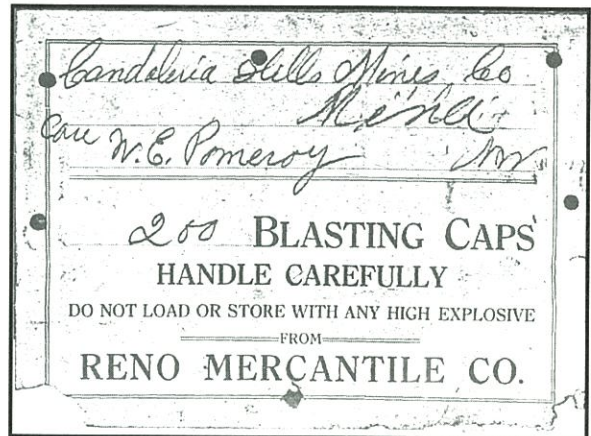
A long weekend behind us, Leo, Roger and myself had to hit the long road back to Colorado. Water was not quite in sight, but close enough to the shaft collar to make us start believing it really might become a wet reality.

Unfortunately, I was not witness to water finally flowing into the Cerro Gordo tanks the following weekend. I understand though that it did so among applause and happy tears. Sufficient to say that the silver town of old Cerro Gordo has achieved a new lease on life over one hundred thirty years after the first pick was sent into its stony ground.

Upon my last visit to Cerro Gordo with Leo in October, water has successfully been flowing since May. Mike has not had to make another trip up the Yellow Grade with his overworked water truck, and has been able to put valuable time toward rebuilding what history apparently won't let die.

✕

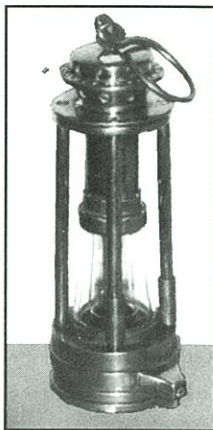
An Interesting Label



Found by Larry Mayne in a drift at Candelaria. The label is from the 1920's.

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SAFETY BLASTING MACHINES

by Eric Twitty

Blasting machines and electric blasting caps date back as far as the 1870's - during this time they were sold under contract by the Laflin & Rand Powder Co. and by one of their inventors, H. Julius Smith (Van Gelder, 1927: 741). However, electric blasting did not take off in mining until the 1910's when delay-action electric caps became widely available (allowing electrically-fired charges to be shot in an order). Mining experts touted electric blasting as being an efficient, safe alternative to standard caps and safety fuse; firing charges required no flame and created no sparks, minimizing the danger of fires in coal mines, and the moment of detonation was under the miner's complete control (Munroe, 1909: 43). In reality, blasting electrically was only as safe as the miners practicing it. Mines worked under contract were notoriously unsafe, and in eastern coal miners worked by many small groups of individuals this was amplified by disorganization, lack of communication, and especially haste.

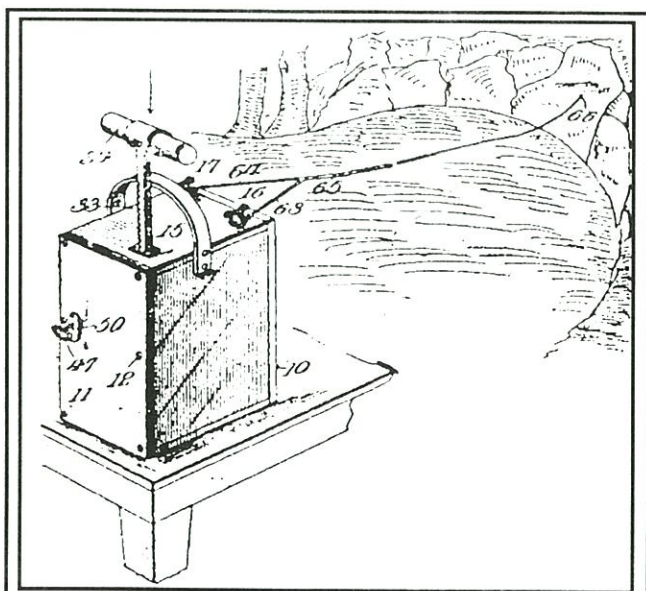


Figure 1. 1 First patented safety blasting machine filed by Joseph Beeneck in Nanticoke, on the last day of 1915. The accompanying text described use of a key to physically break the machines' electrical circuit or to lock the mechanism.

This recipe for disaster resulted in a variety of accidents, one form of which involved miners and their tripping blasting machines while another was inspecting the wiring or cleaning up tools, each not knowing what the other was doing. In response to the above scenario, Joseph Beeneck invented a safety blasting machine in 1915 which specifies that either the electric circuit could be broken by a skeleton key or the mechanism physically locked (Fig. 1). It is not known if he invented the first safety machine, but he was the first to patent it. A blasting machine manufactured by United States Standard for the Atlas Powder Co. fitting Beeneck's patent surfaced several years ago in Pennsylvania (Fig. 2).



Figure 2. An existing safety blasting machine roughly fitting Beeneck's locking mechanism patent. In this photo the baby blaster is along side a standard-size machine. The United States Standard builders' plate is on the side opposite the key-hole and the Atlas plate is on the face, right. (Author).

According to the builder's plate the machine was specified to fire three to five caps, clearly not enough to shoot a round when driving a hard rock tunnel or blasting a stope, but the right amount for blasting a breast in a coal mine. Rounds in hard rock tunnels and shafts typically included more than eight charges while shooting breasts in

coal mines often ranged from two to six. The machine, measuring only seven inches high and four wide, is a miniaturized version of the more common 30 cap blasters and utilizes a proportionately small dynamo. It features a brass builder's plate on one side, a key-hole in the other, and an Atlas Powder Co. plate on the front. When turned, the skeleton key releases a spring- steel sheet which normally pushes into the rack bar s teeth, keeping it locked in the down position; without the key, the machine could not be fired and blow up any miners.

The baby blaster dates between 1913, Atlas' inception, and the early 1920's when the large push-down magneto and hand-held twist machines became popular. This date is also supported by phraseology of the builders plate in which the word 'fuzes' is used in place of 'caps', instructions stated on the plate regarding how to use the blaster, and old-fashioned block lettering for the Atlas label.

The machine shows very little wear, which is no surprise because it was rare for blasting to be conducted electrically in coal mines. In addition, because caps, wire, and equipment

for blasting electrically required capital outlay, this machine was probably owned and used by a coal company rather than individual contract miners.

References

- Munroe, Charles & Hall, Clarence, 1909 *A Primer on Explosives for Coal Miners*, U.S. Government Printing Office, Washington DC.
- Van Gelder, Arthur & Schlatter, Hugo, 1972 *History of the Explosives Industry in America*, Arno Press, New York, NY. ⚡

Here's another poem submitted by Mason Coggin.

THE IMAGE O' GOD

*Crawlin' aboot like a snail in the mud,
Covered wi' clammy blae,
Me, made after the image o' God
Jings! but it's a laughable tae.*

*Howkin' awa' 'neath a mountain o' stane,
Gaspin' for want o' air,
The sweat makin' streams doon my bare
backbane,
And my knees a' haucket and sair.*

*Strainin' and cursin' the hale shift thro',
Half starved, half blin', half mad;
And the gaffer he says, "Less dirt frae you,
Or you go up the pit, my lad!"*

*So I fi' my life to the Nimmo squad
For eichtand fower a day,
Me, made after the image o' God
Jings! but it's a laughable tae.*

Corrie, Joe, *The Image O' God and other Poems*, The Forward Publishing Co., Lote., 26 Brown Street, Port-Dundas, Glasgow 188? — *Mason Coggin*



THE PELTON WATER WHEEL AND ITS HISTORIC MINING ROLE

by Bob Kraft
Bob Samay
Errol Christman

The Pelton Water Wheel, an 1880 patented device to convert high pressure water into mechanical energy, was developed in the northern California mining industry at a time when high pressure water was abundant and the need to run high energy machinery great. Lester A. Pelton, working in Camptonville, California, a center of hydraulic mining, was impressed by the enormous energy of high pressure water used in the attack of gold bearing gravel of the ancestral Yuba river. He was familiar with the older overshot and undershot water wheels and familiar too with the attempts of harnessing high pressure water streams with

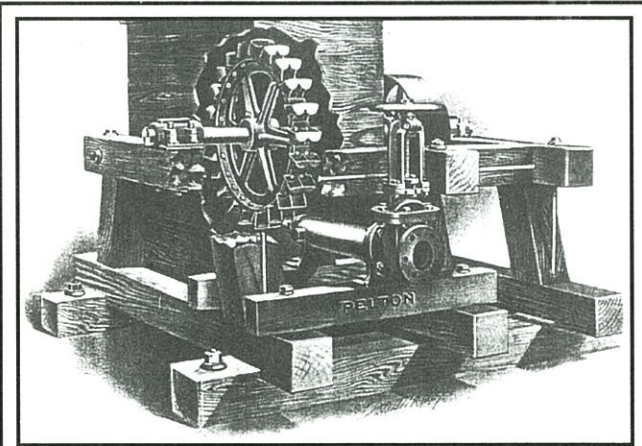


Figure 1. Standard Pelton Wheel mounted on wood frame, 1880 design.

the Hurdygurdy wheels of his time which were plagued by the inefficiencies of splash buildup as the high velocity water would strike the wheel. Hurdygurdy wheels were usually designed with flat paddles at the periphery of the wheel meant to engage a high velocity water stream. The spinning wheel would transfer energy to attached machinery. The classic overshot and undershot water

wheels used for centuries are classified as reaction turbines. They take the force of moving water or gravity of water to turn the wheel. Impulse turbines as in hurdygurdy, Pelton, Knight or Tutthill wheels attempt to transfer the kinetic energy of the high velocity water into the slower moving cup at the periphery of the wheel.

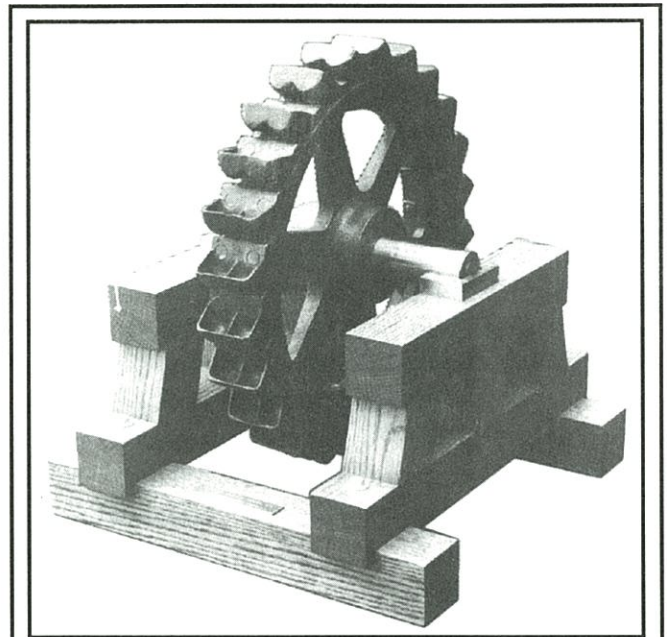


Figure 2. Pelton Wheel. 18 inch diameter, with 1880 design cups. Collection of authors. Photos by Robert Cross.

The brilliant breakthrough of Pelton's design was the division of the water cup into two chambers divided by a wedge or splitter partition. The high pressure jet of water, sometimes exceeding 200 miles per hour, was aimed at the splitter dividing the incoming stream into two portions directing them laterally and at least partially reversing their direction. This achieved two goals:

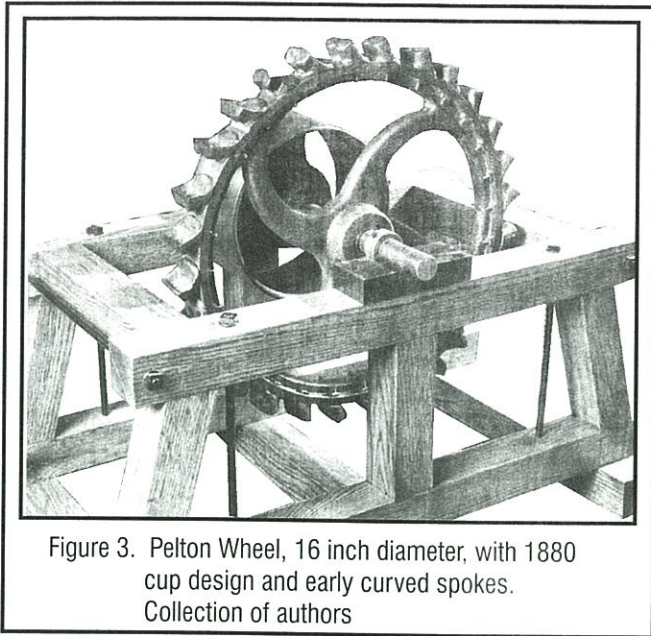


Figure 3. Pelton Wheel, 16 inch diameter, with 1880 cup design and early curved spokes.
Collection of authors

- 1) The clearing of water from the cup to prevent splash buildup and
- 2) The reversal of the incoming stream imparting more energy to the wheel.

The nozzle velocity of the incoming water was considered to be roughly twice the spinning cup velocity.

Many competitors of the Pelton wheel tried to match the efficiency of this patented concept but few if any succeeded. The Knight wheel of Sutter Creek, California, was a major local competitor and actually predated the Pelton by several years. The Leffel wheels, also earlier than Pelton, were primarily designed for lower water head pressures. The Tutthill wheel used alternating left and right cups to achieve the same efficiency concepts of the Pelton. Other foundries such as Risdon and Joshua Hendy were able to manufacture divided cups similar to the Pelton either through franchise agreements or design changes skirting the Pelton patent.

The Pelton proved to be the dominant water wheel in the market place both by scientific testing and marketing efficiency. The Idaho mine, Grass Valley, California, experiment of 1883, using a head pressure of 368 feet, showed an efficiency superiority of Pelton over Knight, Fredenburr and Taylor

wheels. The sales of Pelton wheels in California, western United States and throughout the world grew at a phenomenal rate from 1880 to 1910. The manufacturing was moved from the Miners Foundry in Nevada City, California, to San Francisco in 1888 with the creation of the Pelton Water Wheel Company. The facility was relocated and enlarged in San Francisco after the earthquake and fire of 1906. The plant closed in 1963.

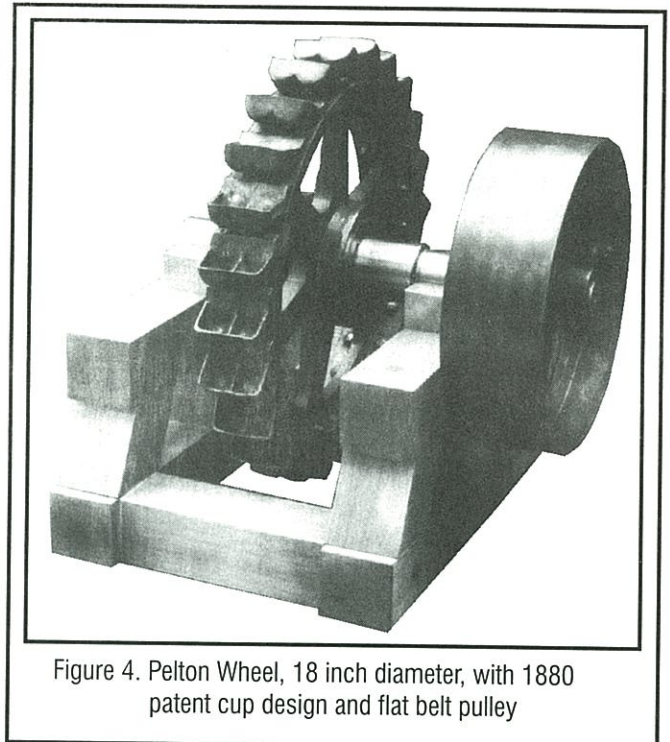


Figure 4. Pelton Wheel, 18 inch diameter, with 1880 patent cup design and flat belt pulley

By 1890, 280 Pelton wheels had been installed in the western United States and another 200 throughout the world. By 1898, 900 Peltons were listed in the United States and another 500 throughout the world. The number of Peltons in use by 1909 worldwide was over 12,000 of which over 10,000 were in the western United States and Alaska. Over 1000 were located in Mexico, Central and South America.

The majority of Pelton wheel installations were tailor-made, based on water head and water volume available, horsepower requirements and types of machinery to be driven. The average

installation would call for a steel wheel and a single fixed nozzle. More than a single nozzle, sometimes up to five, would be used for high water volume and limited water pressure. With variable work loads, a governor, jet deflector, needle nozzle and nozzle deflector would be added to protect against a runaway unloaded wheel and even worse, water hammer of the pipeline if the nozzle flow was suddenly reduced. Needle nozzles, with an adjustable brass or steel contouring needle in the center of the nozzle, were widely used in high pressure systems where hand adjustments or governing were essential. Needle nozzles, controlled by governors were frequently used for RPM control in the generation of electricity. Quintex wheels with five nozzles directed at the same wheel were only recommended for installations below 50 feet of head and were not equipped with needle nozzles or governors. In extremely

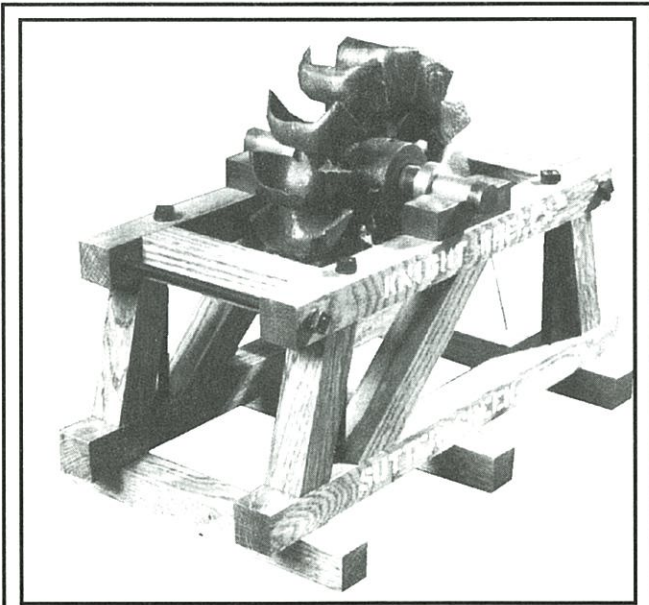


Figure 5. Knight Wheel, 6 inch diameter, one piece cast iron. Non-divided cup.

variable workload installations such as saw mills, air compressors or mine hoists, the water hammer prevention apparatus would consist of a jet deflector (intercepting the jet so that it does not strike the cup), a water escape valve, a nozzle deflector (aiming the

nozzle away from the cup) or even a second needle nozzle (not aimed at the wheel) which would open synchronously as the real needle nozzle closed by action of the governor. All of

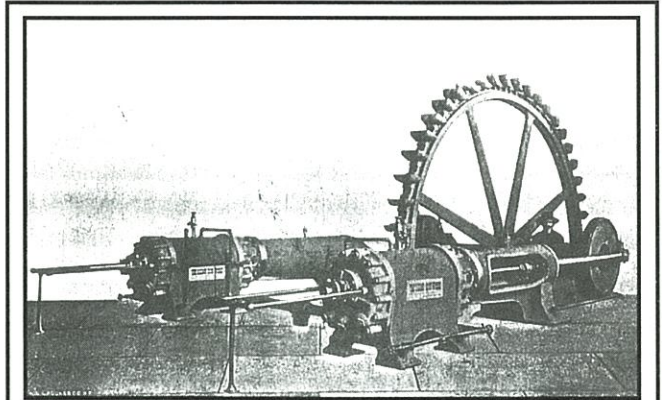


Figure 6. Twenty four foot Risdon Wheel driving air compressors, 500 H.F.

these would reduce water energy striking the wheel without water hammer damage to the riveted steel piping. It should be remembered that some of these high pressure systems exceeded 1000 pounds per square inch static pressure, much higher when moving water was stopped and ten times greater than most fire hose pressures.

Pelton also sold off-the-shelf wheels, known as their "D" wheels, and self-contained encased water motors, known as their "C" wheels. These

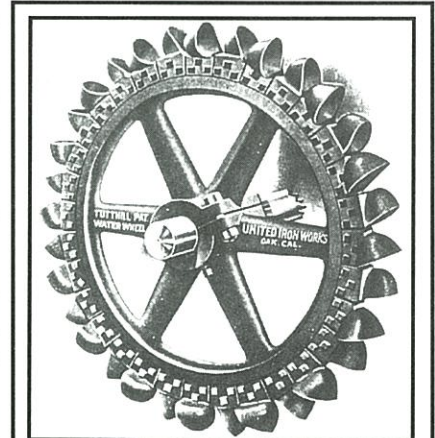


Figure 7. Tutthill Wheel with alternating left and right cups.

were less expensive and would serve the purpose of many generic water wheel tasks. The classic Pelton cup design of the 1880 patent was rectangular with a center splitter partition. Many modifications of this followed with the greatest change in approximately 1900 known as the Pelton Doble cup with

rounded corners in an ellipsoidal configuration. The center partition remained in all Peltons.

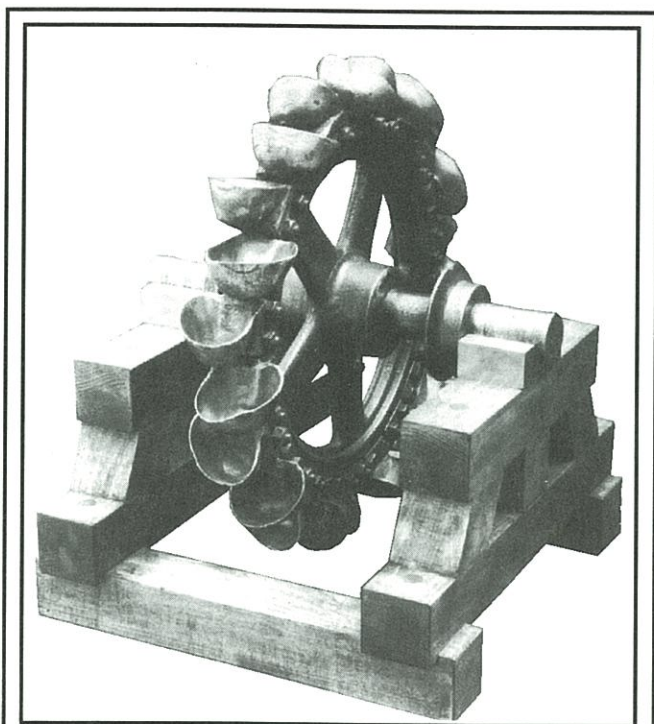


Figure 8. Tutthill Wheel, 20 inch diameter. Alternating left and right bronze cups. Collection of authors.

The Pelton water wheel and other tangential impulse systems arrived on the mining and industrial scene at a time to replace steam engines. Many mines had already stripped their local forests for mining timbers and fuel for steam engines and were happy to find an alternative energy source. The earliest use of impulse water wheels was to convert high pressure water energy into mechanical energy. This conversion was particularly useful in western mines where mountainous terrain provided the high pressure water and the mechanical energy for machinery was greatly needed. The electric motor soon replaced the Pelton wheel at the mine location if electricity could be provided at these remote sites. Since the Peltons and other wheels were well suited for electricity production, many mining and industrial sites, generally by 1900, converted to electricity and the Peltons at other locations became the primary producers of this power.

The history of the Pelton wheel could therefore be summarized as direct powering of machinery during the decade of the 1880's and production of electricity beginning in the decade of the 1890's. From approximately 1885, for at least 60 years, Pelton and other leading tangential water wheel manufacturers were at the forefront of the pioneering hydroelectric industry. The tangential wheels slowly gave way to the turbine designs where water flow is parallel to the axis of the runner. Pelton Francis turbines and Leffel turbines were early prototypes of these machines.

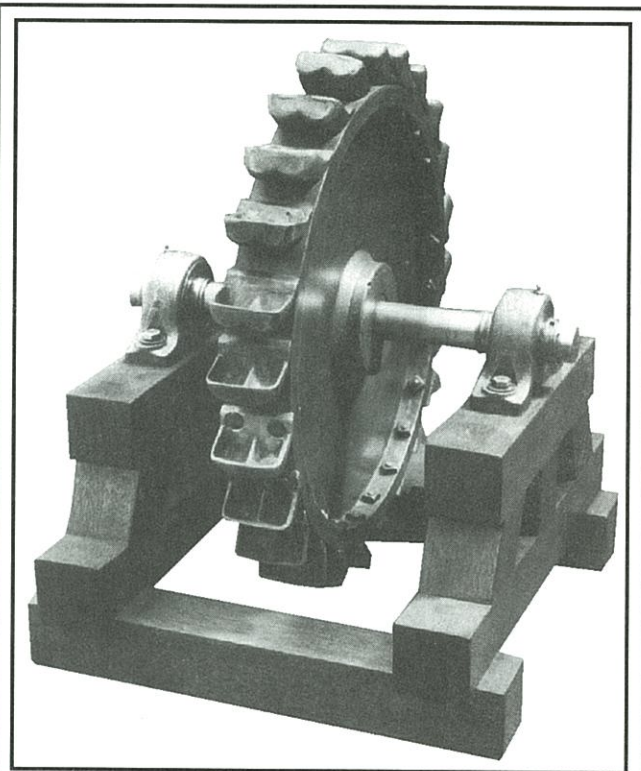


Figure 8. Pelton Wheel, 21 inch diameter, solid disc wheel with 1880 design cups.

By 1890, several hundred western mines were using Pelton water wheels for a primary energy source. Examples are listed here:

Idaho Mine	
Grass Valley, CA	16 Peltons
Empire Mine	
Grass Valley, CA	6 Peltons
North Star Mine	
Grass Valley, CA	10 Peltons

IXL Mine Nevada County, CA	3 Peltons
Kennedy Mine Jackson, CA	7 Peltons
Amador Gold Mining Co., Jackson, CA	10 Peltons
Plymouth Mine Plymouth, CA	7 Peltons
Treadwell Mine Douglas Island, AK	5 Peltons
Anaconda Smelting Works Montana	1 Pelton

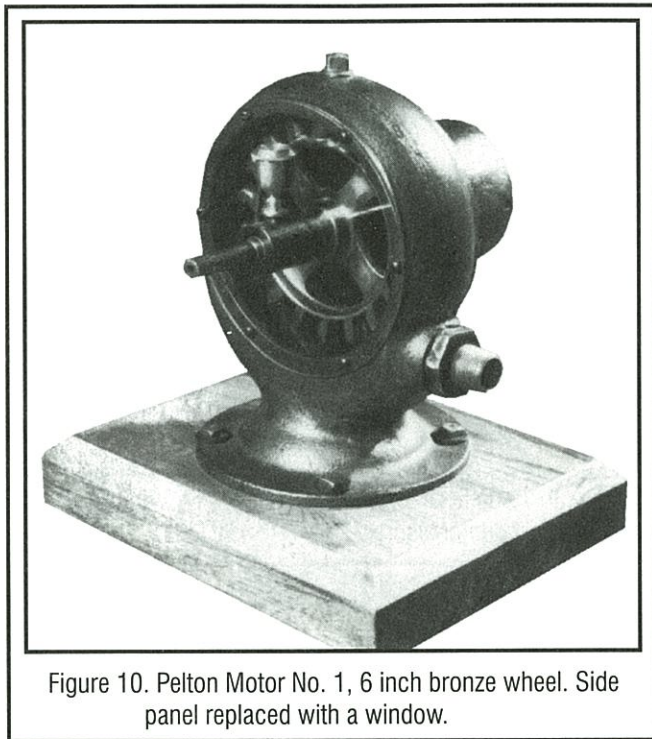


Figure 10. Pelton Motor No. 1, 6 inch bronze wheel. Side panel replaced with a window.

The largest Pelton wheel created, during this period, served the North Star Mine, 30 feet in diameter, turning at 65 RPM, developing 1000 horsepower, water delivered from a 1 $\frac{3}{4}$ inch nozzle attached to a 20 inch diameter penstock with 735 feet of head and driving two air compressors. The compressed air ran most of the machinery of the mine. A 33 foot Pelton was created later.

The Empire Mine in Grass Valley, just up the hill from the North Star, stopped using steam engines to drive its machinery in 1886 and converted entirely to Pelton wheels for its

stamp mill, air compressors, water pumping, hoists and machine shop. This lasted only five years and the conversion to electricity became more convenient. By 1900, most major mines in the West were electrified. By 1890, over 300 Knight water wheels, a major competitor of Pelton, were in use in the western United States. The earliest installation of a Knight wheel was at the Lincoln Mine in Sutter Creek, California, in 1875, five years before the Lester Pelton patent. The water-powered Knight's Foundry in Sutter Creek became a California historic site after continuous operation from 1873 to 1995, a facility covering 16,000 square feet. In the 20th century the Knight wheel was only one of several wheels competing against the much more successful Pelton. These competitors included such names as Hendy, Tutthill, Risdon, Leffel, Chicago, Syracuse and Backus.

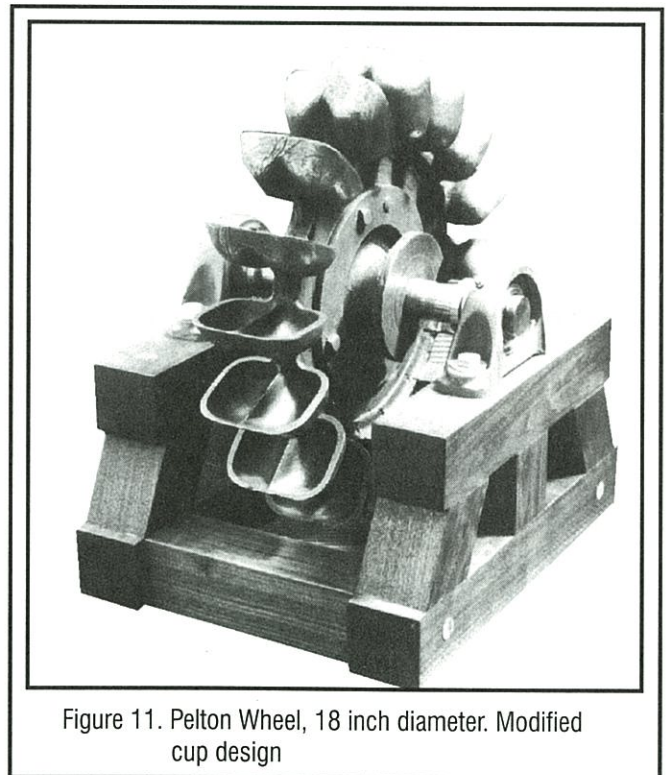
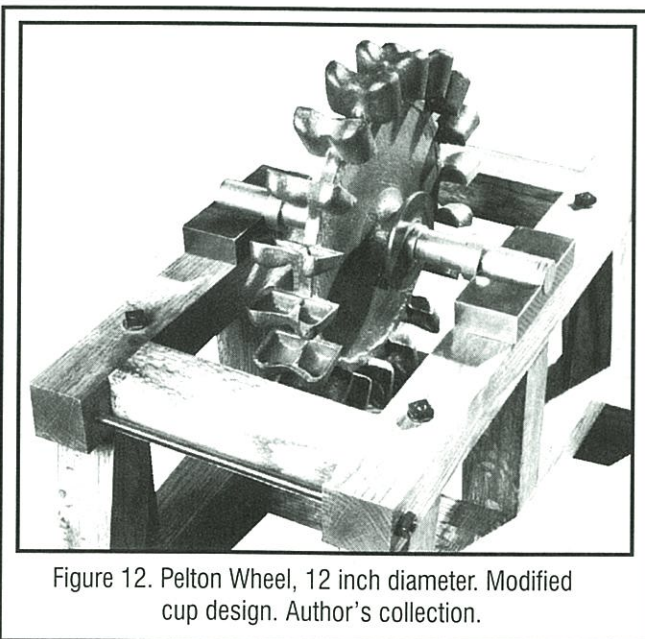


Figure 11. Pelton Wheel, 18 inch diameter. Modified cup design

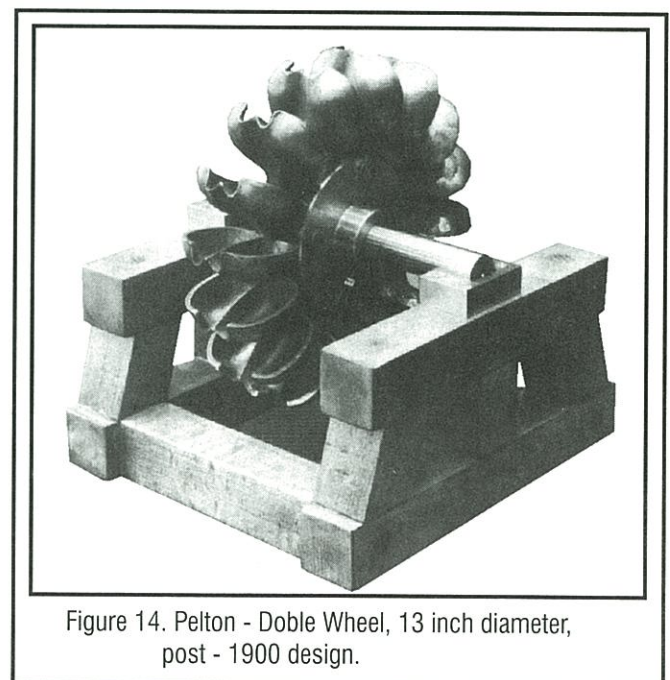
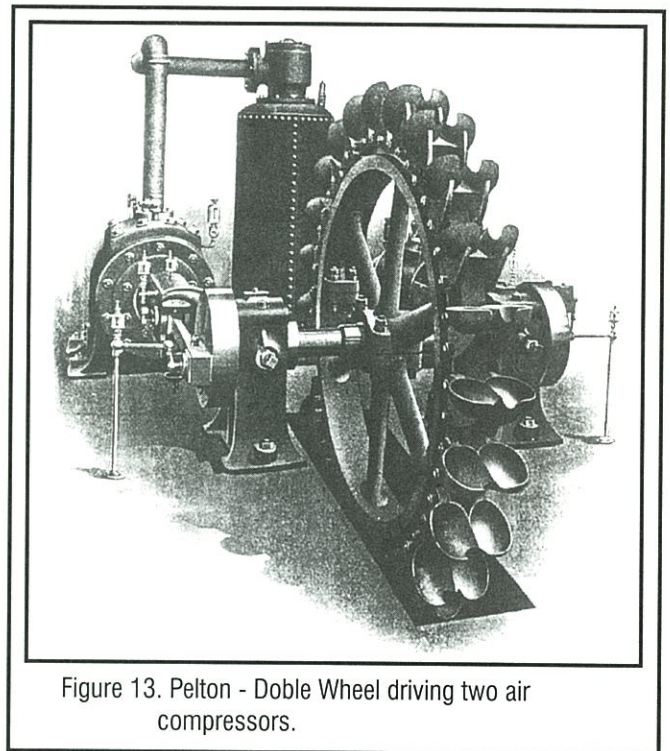
One of the earliest major hydroelectric installations was in Aspen, Colorado, a mining town of 7000 inhabitants, where in 1889, a mile long 14 inch steel pipe delivered

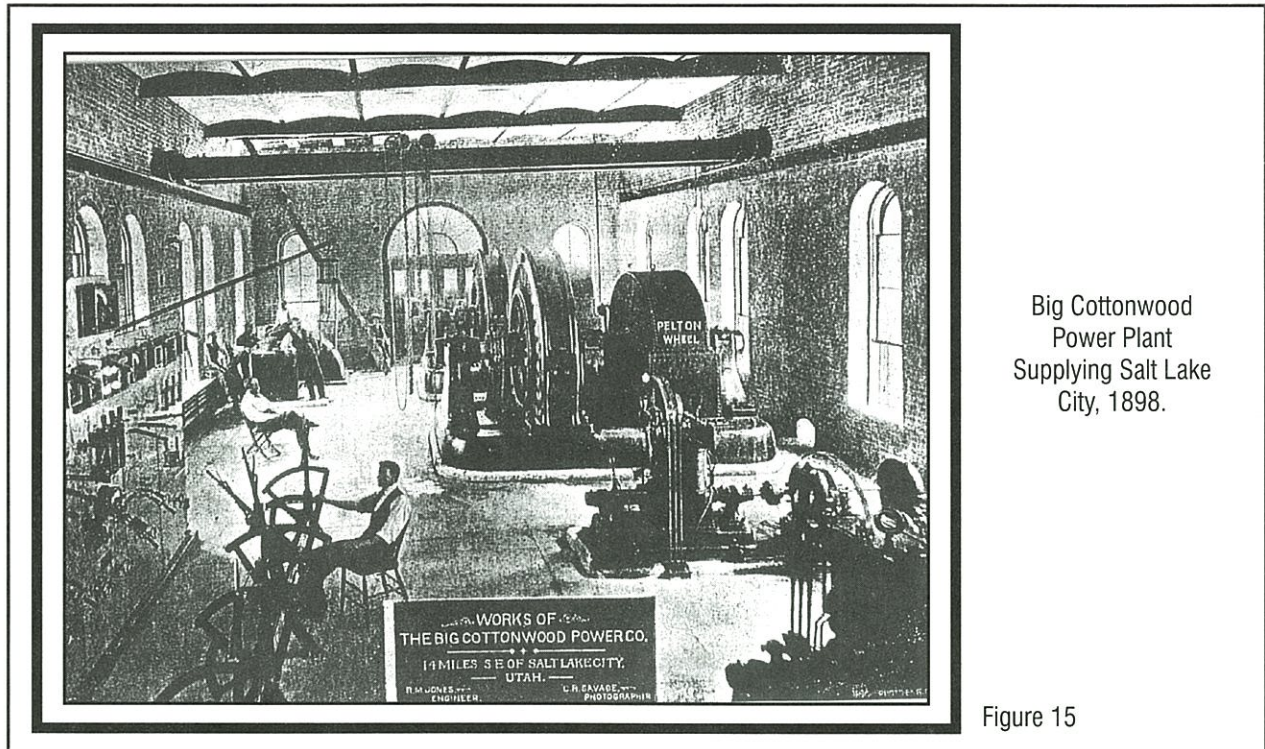
water to eight 24 inch Pelton wheels turning at 1000 RPM producing an aggregate 1400 horsepower. This was the electric power for the entire town of Aspen as well as many mills and mines in the vicinity. A mile away at Castle Creek, two 300 horsepower double nozzle five foot Peltons were generating electricity. In 1896, Fresno, California, was electrified through a Pelton water wheel plant on the North Fork of the San Joaquin River 35 miles away. A 4000 foot steel pipeline delivered water with a vertical head of 1410 feet to three 57 inch, 500 horsepower Pelton generator pairs and two 20 inch Pelton driven exciters. The city of Salt Lake City in 1898 was electrified by a Pelton powerhouse installation on Big Cottonwood Creek 14 miles from the city. Four 60 inch Pelton wheels, 650 horsepower each, running at 300 RPM under a water head of 380 feet drove four three-phase generators. Other Pelton wheels were used for field exciters. Water was brought to the Peltons through a 2400 foot 50 inch riveted pipe.



In 1878, Lester A. Pelton produced a mechanical device which changed mining engineering techniques throughout the world. It can also be said that the Pelton

wheel and the competitive engineering of other water wheel companies were the nucleus around which today's hydroelectric industry was built. The 1890 Pelton Catalog boasted that the Pelton Wheel was California's most illustrious invention.





Big Cottonwood
Power Plant
Supplying Salt Lake
City, 1898.

Figure 15

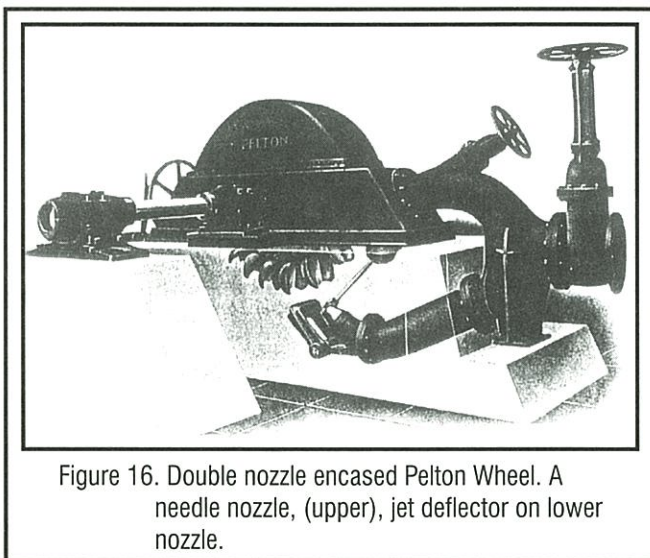


Figure 16. Double nozzle encased Pelton Wheel. A needle nozzle, (upper), jet deflector on lower nozzle.

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GRANITE MOUNTAIN SHAFT FIRE, BUTTE, MONTANA

by H. Mason Coggin

The Clinton Administration killed the US Bureau of Mines two years ago and nothing was created to fill a research and development gap left by one of America's most useful and practical agencies. Mine safety was assigned to the Mine Safety and Health Administration (MSHA) but it has never had the task of reporting on a disaster of the magnitude described below. It is a rewrite of the Bureau of Mines investigation into the Granite Mountain Shaft fire of June 8, 1917 in Butte, Montana and the recommendations that came from this investigation.

On the night of June 8, 1917, a fire at the North Butte Holding Company's North Butte mine caused the death of 163 men. At that time it was the worst mine disaster in an American metal mine. It was only through the efforts of the North Butte's and Anaconda Company's mine rescue teams that all 410 men working in the mine at the time were not lost.

The mine consisted of a main shaft, the Granite Mountain, which was 3,740 feet in depth. It had two main hoisting compartments and a third compartment, separated from the other two by a heavy timber partition. It carried a man cage, air lines, water pipes, and electric power lines. As a downcast shaft with a heavy flow of air it was the main source of fresh air for the workings of the Granite Mountain and the adjacent shafts. A second shaft, the Speculator, was about 3,000 feet in depth, equipped with cages, and connected by drifts or crosscuts to the Granite Mountain shaft some 800 feet away at various levels. Two supplementary ventilation shafts, the Gem and the Rainbow, were connected on and various levels and there were connections to other mines.

On the night of June 8, 1917, a fire at the North Butte Holding Company's North Butte mine caused the death of 163 men.

With the Granite Mountain shaft the North Butte mine was the best ventilated mine in the Butte district. Two surface fans at the Rainbow and Gem shafts exhausted about 50,000 cubic feet of air per minute (cfm) from the workings. Another 10,000 cfm naturally up drafted through the Speculator shaft. A reversible fan at the collar of the Speculator shaft was not in use when the fire started. Augmenting the ventilation system was a large number of electric fans with canvas vent pipe carrying air to the working faces in the drifts, stopes and raises. A large number of underground doors controlled the air currents. The mines were electrified to supply power, light, and 15 trolley locomotives. Almost every level was supplied with 2300 volt power that ran from the Granite Mountain shaft to a transformer on the various stations.

Planning to prevent a serious fire in the Granite Mountain shaft, the North Butte Co. had started installing a sprinkler system in the shaft for fire protection at the time of the fire. In a typical manner small tanks were located at intervals in the vertical shaft to reduce and equalize the water pressure on each of the various levels. Included in the fire prevention plan was a program to move the main transformer from the 2,600 level station to a transformer bay several hundred feet away from the shaft.

At the time of the fire, six men were lowering 1,200 feet of lead armored cable into the shaft for this transformer move when the cable slipped from its lashings on the hoist cable and fell down the shaft. The cable lodged itself between the 2400 and 2800 levels. The cable weighed approximately 3 tons and was lashed to the hoist rope by lengths of hemp rope, placed every 10 feet along the

cable for the first 500 feet then at 5 foot intervals thereafter. Clamps were not used in fear of crushing the cable. During the fall the cable broke water pipes and damaged some of the protective lead armor around the cable, exposing and fraying the oil-impregnated fabric and jute insulation. Half of the cable by volume was this oil impregnated, highly flammable material that acted as insulation for the electrical cables at the time.

At 11:30 p.m. the assistant foreman, a shift boss, and two shaft men were just below the 2,400 foot level trying to attach the cable to the cage and pull it back up. As the damaged cable was being examined, the flame of a carbide lamp came into contact with the insulation and a blaze started.

The men were forced to retreat to the 2,400 foot station. In spite of their efforts to extinguish the fire, the shaft timbers became ignited. The heat from the fire changed the air flow in the normally downcast one compartment to an upcast chimney. Smoke began spreading through the mine and within 30 minutes smoke began issuing from the Speculator shaft. Within one and a half hours it had spread into the two connecting mines. Foremen and shift bosses ran through the mine warning the men to leave. A number of the men escaped through the connecting mines. Three groups had bulkheaded themselves into the end of a dead end drift and 25 out of 29 were saved in one location and 6 out of 8 in another. Thirty two men were taken up the Speculator shaft to safety. Of the 410 men in the mine at the time of the fire 163 perished. Two were burned to death and the others were asphyxiated by the gases from the fire.

Soon after the fire started, the fans at the Gem, Rainbow, and Speculator shafts were reversed to force approximately 100,000 cfm of fresh air into the mine and exhaust

them through the Granite Mountain shaft. Eventually the fire was abated with water. Care was taken to maintain the upcast flow of air in the Granite Mountain shaft. Fans

were installed underground to aid the rescue parties and establish fresh air bases. About 48 hours after the fire started suction fans were placed in operation over the Granite Mountain shaft insuring that it would remain an upcast shaft to clear smoke and gasses from the lower levels.

Mine rescue teams from the North Butte Mining Co. and the neighboring Anaconda Copper Mining Co. equipped with self contained oxygen breathing apparatus began immediately to assist live men to safety and reclaim the bodies of the 163 men who were lost.

A Bureau of Mines rescue team arrived from Red Lodge, Montana one day after the fire began.

A Bureau of Mines rescue team arrived from Red Lodge, Montana one day after the fire began. Twelve hours after the start of the fire 50 self contained oxygen breathing apparatus were available, and 30 men wearing this equipment worked three shifts per day for well over a week.

By the second morning the Bureau of Mines rescue car reached the site by rail from Colorado bringing the rescue apparatus to insure the rescue. Forty-eight hours after the fire started the Speculator was cleared of gases. Twenty five live men were rescued from behind bulkheads on the 2400 and 80 bodies were recovered from other workings. The recovery of 75 more bodies followed in the next eight days. Several additional bodies were recovered in the following weeks.

The US Bureau of Mines made the following conclusions from their studies of the disaster:

1. The upper end of an electric cable being lowered in a shaft should be firmly clamped, even if such clamping does ruin 8 or 10 feet of cable.
2. Electric cables in hoisting or ventila-

tion shafts are a fire hazard. Bore holes should be used to bring such cables into a mine if practicable; if not, they should be placed in upcast shafts or in shafts or shaft compartments that are as nearly fireproof as possible.

3. When a mine has two shafts, and the one downcast is afire and filling the workings with smoke, efforts should be made by fans and other means to convert this shaft into an upcast.

4. The main hoisting shaft of every deep mine should be fire proofed.

5. Connections between mines should be closed with airtight doors held closed by a positive latch that can be readily opened from either side in case of need.

6. To provide adequate ventilation and allow safe removal of men in case of disaster every mine should have at least two hoisting shafts. Levels should be connected with both shafts.

7. Tightfitting fire doors, of fireproof construction, should be provided in every drift, crosscut, or other opening leading from any shaft. These doors should be self-closing and equipped with a latch or other means of preventing opening by reversal of the air current.

8. Direction signs in several languages should be posted indicating the direction of escape ways.

9. Timbered shafts should have ample facility for quick action fire protection. Water lines for fire protection should be extended through mine workings, especially if timber or other combustible matter is present.

10. There should be means for warning men promptly in an emergency.

11. Rescue apparatus and men trained to use this equipment should be available at every mine where men are employed to work underground.

Note: In the succeeding years all of the recommendations and many more were written into the mine safety code of many states

and then were adopted by the Mine Safety and Health Administration when it was established in the 1970's. The Granite Mountain Shaft Fire and the loss of 163 men was an American catastrophe. It had a profound effect on how industry and mine safety officials planned for the prevention of fires and the protection and rescue of miners if a fire should occur.

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SMOKE HOUND

*You've heard the one, of the 'wrath to come',
Now heed the 'smoke hound's song.
As he sits on the floor, 'mid the furnaces roar,
And 'strings' the rustler along.
'My son,' says he, 'ere long you'll be
A 'fire eater,' tried and true,
Possibly, a czar, with hammer and bar,
Therefore this applies to you,"*

*"If your mind should run, to that life to come,
And doubts surround you, sore,
I wish you to learn, that you're bound to burn,
When you life on earth is o'er.
You've chosen a trade, that the devil has made
For his helpers, here, to train,
And Dante's dream, will make it seem,
This training is not in vain,"*

*As the 'smoke hound' spoke,
from the furnace broke, a stream of gas and fire.
The rustler turned, his shoe soles burned,
Says he, "You are a liar,
I've followed the plow, to farm I know how
Although I may have to bum,
If I can make the gate before it's too late
Arkansas here I come."*

Sam L. Manatt
Copper Queen Bulletin, Feb. 1928

Mason Coggin is still looking for old mining poems. If you have any old poems that you would like to share please send them to H. Mason Coggin at the Arizona Department of Mines and Mineral Resources, 1502 W. Washington, Phoenix, AZ 85007.

THE GRANT CANDLE COMPANY

by Lane Griffin

One of the older and somewhat more obscure candle companies to supply lighting supplies to the western mines was the George M. Grant company from Philadelphia, Pennsylvania. It is believed that the C. H. Grant candle company is a successor, probably the son or a relative of George Grant and also produced candles in the late 19th century. Several examples of the smaller boxes (20 6's) have been preserved from the western mining camps of California and Nevada. A cursory check of the corporate records in Philadelphia failed to uncover any historic data on these companies, but perhaps new discoveries or information will be forthcoming. ✕



Figure 1. Geo. M. Grant & Co., this box was found at Reveille, NV., a silver mining district active in the late 1860's and 1870's. Courtesy Andy Martin

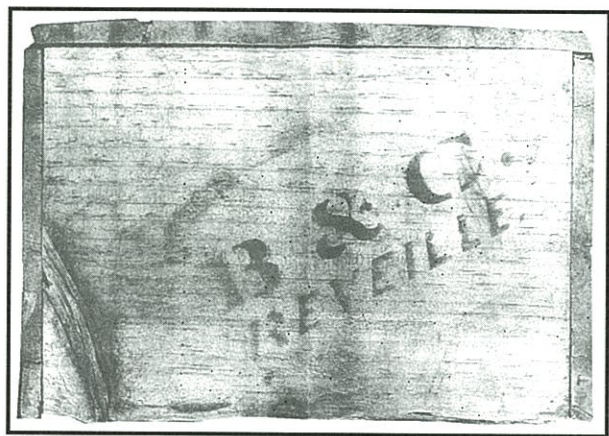


Figure 5. C.H. Grant & Co. end, side and partial wooden black powder keg top from the Relief Mine, Pershing Co. In 1869 rich silver ore was discovered at this mine, originally known as the Batavia and Pacific (B.&P. M. Co.). The mine is estimated to have produced 200,000 to 2,500,000 ounces of silver mainly during the 1870's.



Figure 3. Box end, Geo . M. Grant & Co., Ivanpah, California. Courtesy Andy Martin



Figure 2. Box end, C.H. Grant & Co., with a date of 1870, lone, NV. Courtesy Andy Martin

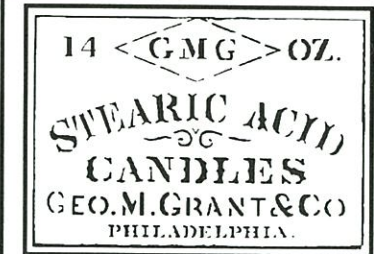


Figure 3

Figure 4



Figure 4. Box end, C.H. Grant & Co., Relief Mine, Pershing County, NV

PROSPECTOR'S ARRASTRAS

by Deric English

A prospector's arrastra is one of many terms used to describe an ore grinder. Although these grinders are sometimes called prospector's arrastras, it seems likely the prospector would prefer using a smaller, lighter mortar and pestle, leaving the seventy-five pound ore grinder to the assayer or assay shop. Other terms used to describe this weighty prospector's arrastra are gyratory mullers, crushers, grinding mortars and pulverizers.

Obviously, the function of these ore grinders are to crush or pulverize rock into smaller particles (fines). Once the rock is pulverized to a desired size, panning the fines will indicate the prevalence of precious metal.

The following ore grinders represent a few of the various examples known.

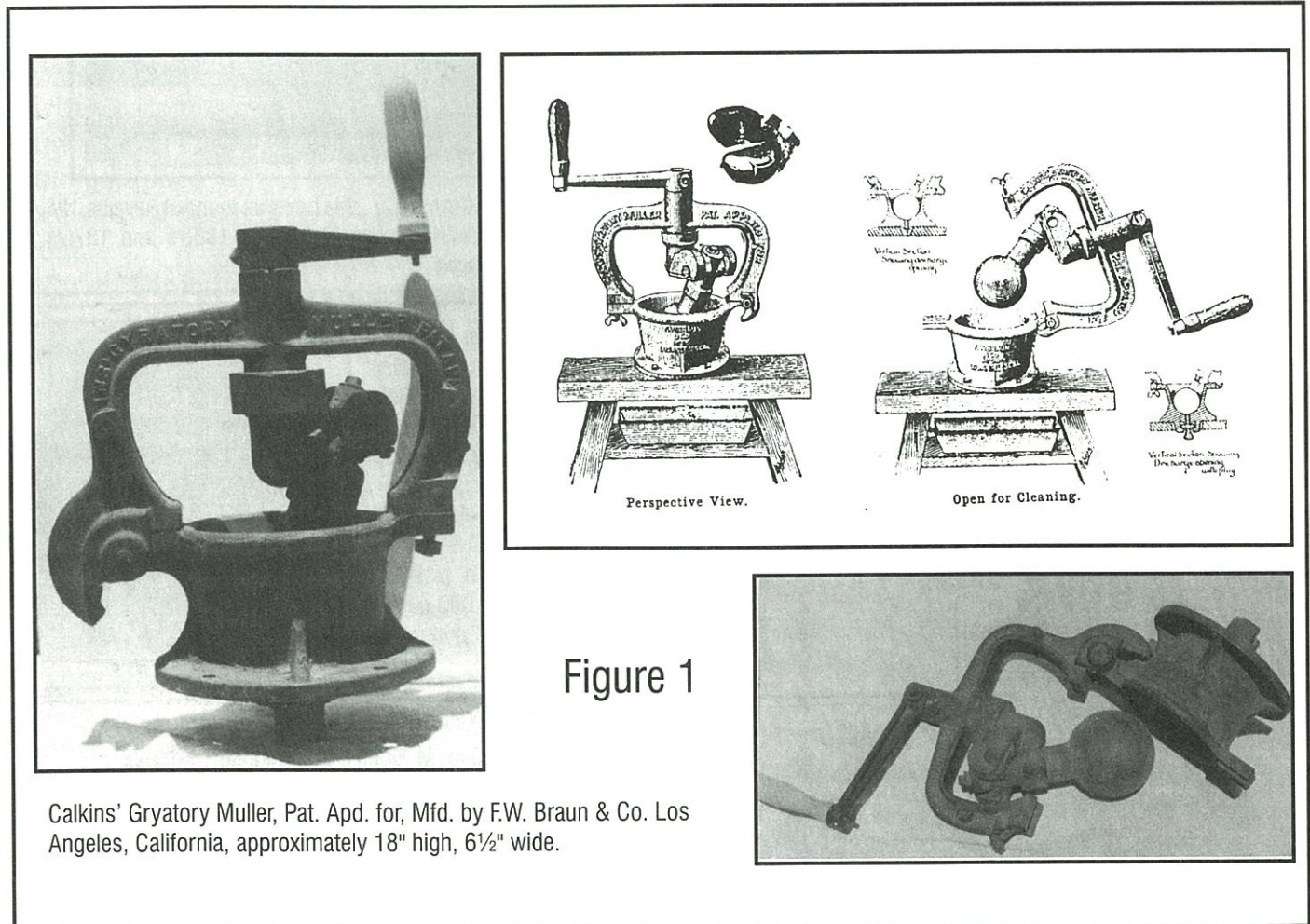
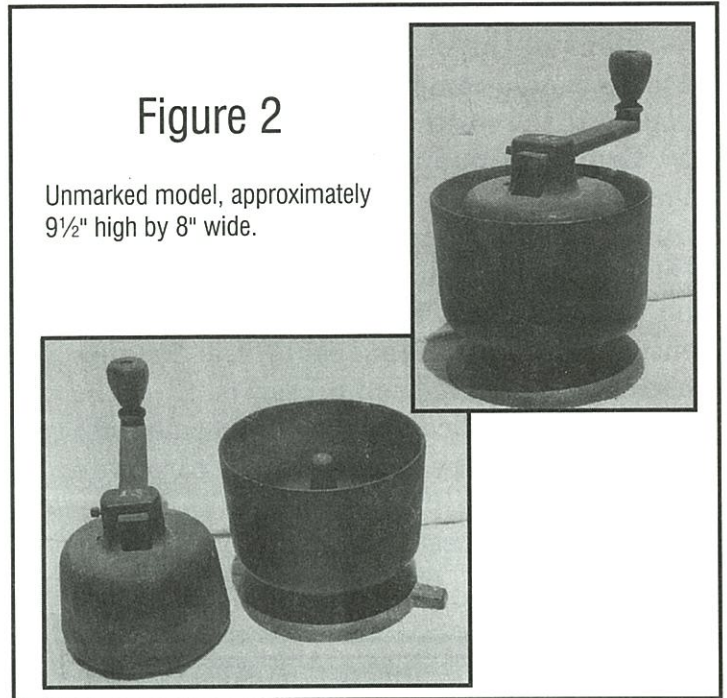


Figure 3

Sold by J. Caire, J. Caire Sole
Agt., PTB Geo W White, March
19, 1899, approximately 8½"
high by 6½" wide.

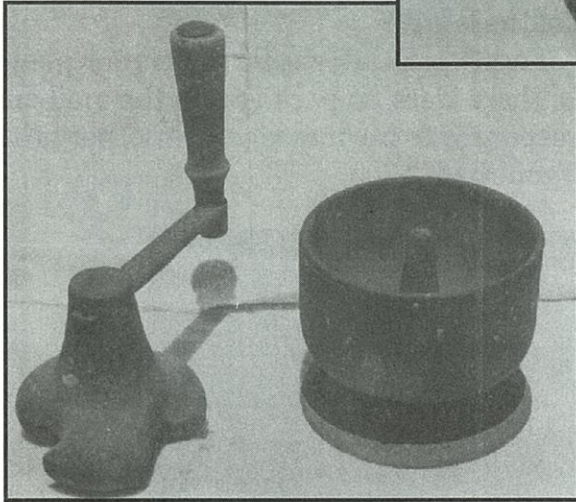
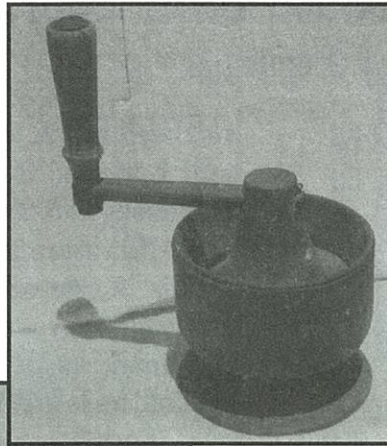


Figure 4

Unmarked model,
missing handle,
approximately 11" tall
by 8" wide.

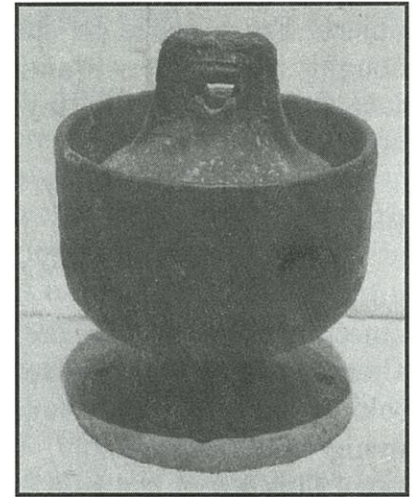
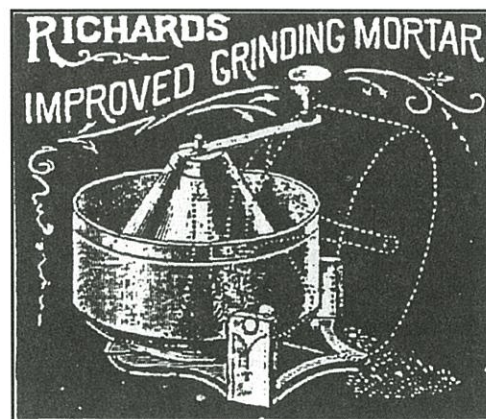


Figure 5



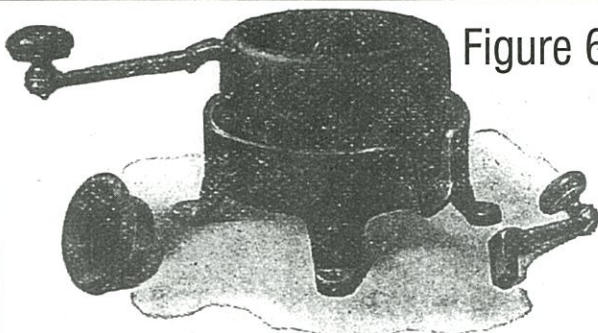
Prospector's
Arrastras catalog
illustration from
Denver Fire Clay.

Figure 7



Catalog illustration of Richards Improved
Grinding Mortar.

Figure 6



Crusher-Weatherhead catalog illustration from The Calkins
Co., Los Angeles, California.

THE HARDSOCG LAMP SCORE

by Greg Millar

It all started on my seasonal trip to Los Angeles. On most trips, time permitting, I'd stop and check with the local mall antique shops. One in particular has been a good "score" from time to time... so the mining artifact hunt was on. Walking into the store, I scanned aimlessly around to pick up on my subject. From space to space... nothing. I thought to myself - "another picked out place, time to shoot my mouth off." I confronted the attendant,

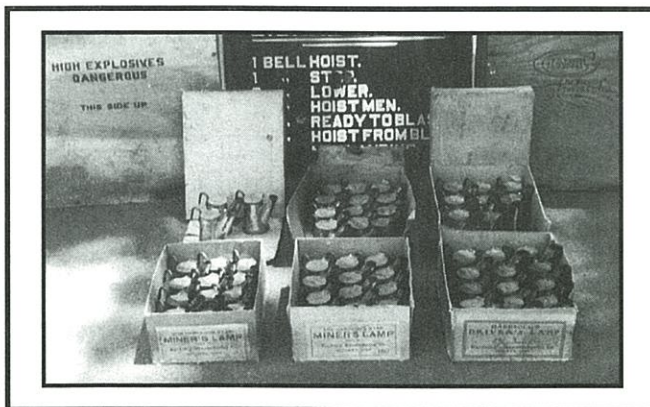
"Hey butthead! Any leads on mining stuff?"

He looked awkwardly at me, "What did you say? Oh, it's you - I think I've got something. One of my pickers stopped by the other day with some boxes full of tea pot looking stuff. But they had labels on them saying 'Miner's Lamps'."

"This is cool, but when can I see them?"

"My picker will be back next week and I'll see if I can pick them up for you."

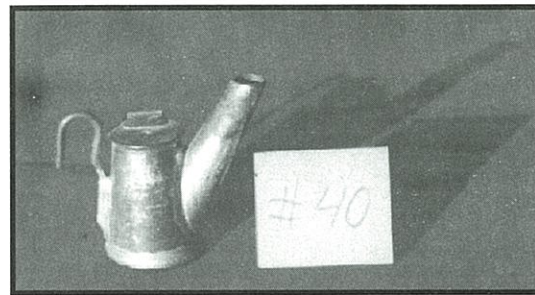
I then asked him how many boxes and when he said four or five with a dozen lamps in each I knew this was a major find. Then he said they were just like new, I told him I would be interested in **all** of them.



A week later I called the shop in L.A. and when I enquired about the lamps I was told that only one box was picked up. Apparently they figured that I would want to double check the one box before committing

to them all. A week later the package came and I opened it to find a complete box of 12 Hardsocg #5 Driver's Lamps, unfired with their lids stamped, Jan 30, 1927. Well, Well... if this is one of four or five boxes then this could be a great deal. I immediately got "on the horn" to L.A, and had them send me the rest of the lamps.

Four weeks later, after numerous phone calls, there were no packages in the mail and no responses to my messages. "Another great deal gone bad?"



#40 Miner's Lamp

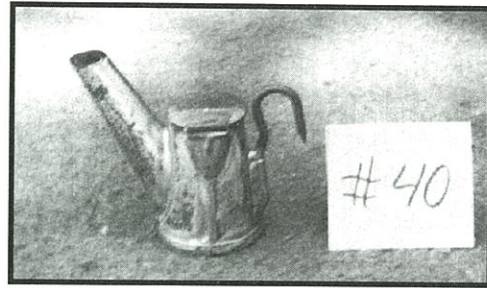


#5 Diner's Lamp

Unlike most transactions like this one , this story has a good ending. I received a call the following week confirming their shipment. Finally, all the boxes arrived and they all had lamps, lots of lamps, the accounting is as follows:

Style	Label	Quantity
#5	Driver's Lamp	20(12 each w/box)
#150	Miner's Lamp	27 (12 ea w/box)
#40	Miner's Lamp	12 (1 box only)

A total of 59 lamps



#40 Miner's Lamp

January 30, 1927 must have been a good day that year for the production of this issue. All lids have a rubber stamp on top. Rumor has it that they originated from a U.C. Berkeley Geological Department clean up years ago. This is a rare find, but how rare? Where do we draw the line on value and collectability. Most collectors see value and quality in those individual lamps that have been used and their appearance and functionality maintained. But what about those that are unfired and in their original boxes? ✂



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A ROCKY MOUNTAIN MYSTERY

by Roger Peterson

The Rocky Mountains used to be liberally stocked with mining artifacts strewn about its surface. The harsh winter weather took its toll on less durable items such as lamps, candlesticks, powder boxes, tins, etc. Sturdier items like tram and ore buckets, ore cars and horse whims used to be a part of the landscape around most old workings. Today, being able to find such artifacts lying on the surface is pretty much a thing of the past. Now, even finding component parts of these artifacts is rare!

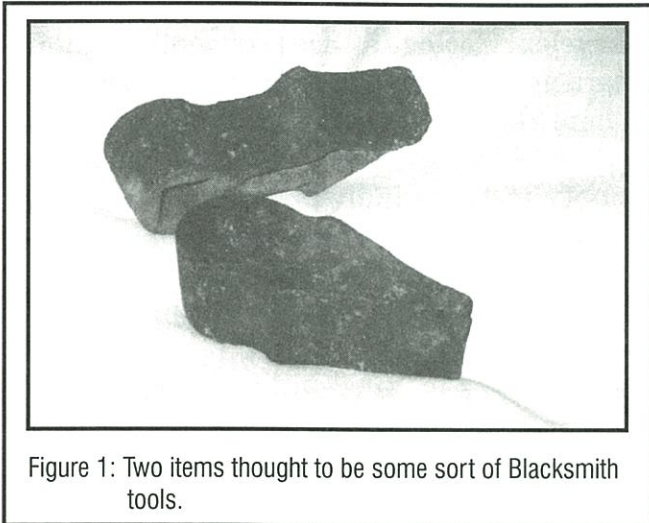


Figure 1: Two items thought to be some sort of Blacksmith tools.

It is also a fact that most mining areas, including the Rockies have always had their “mysteries” – usually associated with lost mines containing caches of gold and riches hidden decades ago by untrusting miners who for whatever reason were unable to return to claim their wealth. Numerous books have been written about these lost fortunes, all designed to entice the reader to believe that he might well be the person with the intuitive skills to unlock the mystery and become rich in the process!

You may be asking yourself what the above two seemingly unrelated paragraphs have to do with one another: In fact, this is a story about another mining mystery the Rocky Mountains have presented us: not one

of hidden mines and wealth but one that relates more to artifacts and relics. Truly a mystery awaiting solution!

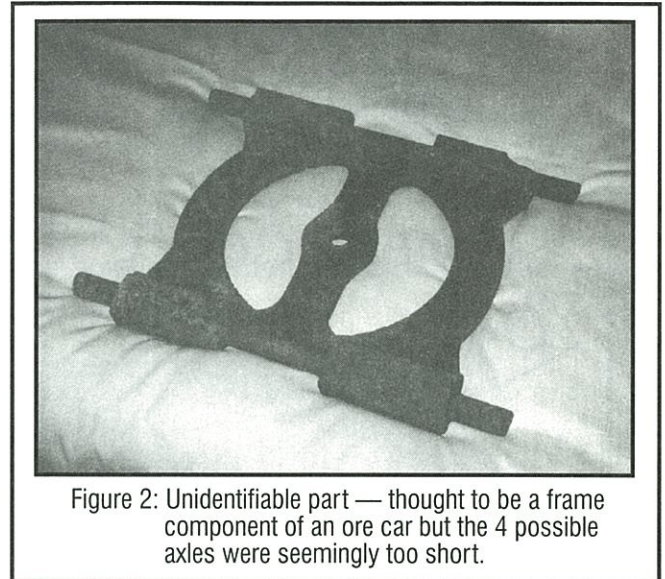


Figure 2: Unidentifiable part — thought to be a frame component of an ore car but the 4 possible axles were seemingly too short.

The mystery started years ago with several people finding unique parts laying in gullies and around mine dumps in the Rockies west of Denver. While not being able to identify most of the items, they were unique enough to merit the collectors hauling them home in hopes that someday they would be recognized for what they really were.

Figures 1 through 4 show several of the components and what they were thought to possibly be.

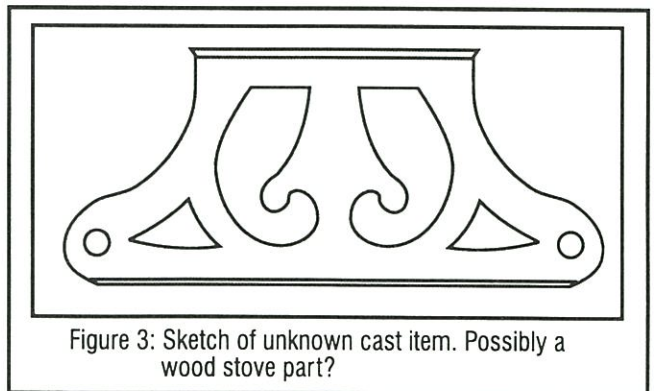


Figure 3: Sketch of unknown cast item. Possibly a wood stove part?

In late 1996 part of the mystery was destined to be solved! Steve and Malia Rush, while hiking at timberline west of Denver

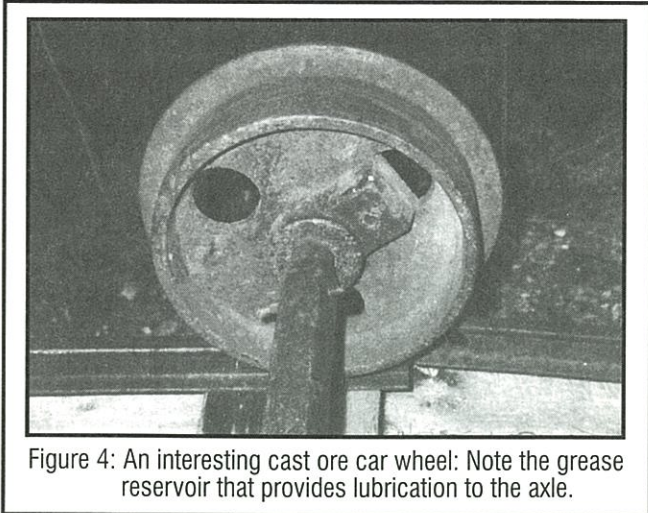


Figure 4: An interesting cast ore car wheel: Note the grease reservoir that provides lubrication to the axle.

discovered an ancient cabin perched precariously on the edge of a steep slope. The cabin had once been the home of a miner and was built in close proximity to the portal of his working. As there was no evidence of trams, roads or even a burro trail, how the enterprising miner was able to get the materials for the cabin to the site was amazing: much less any of the heavy items necessary for mining. Upon further investigation, just inside the mine adit rested an ore car, complete except for want of a tailgate!

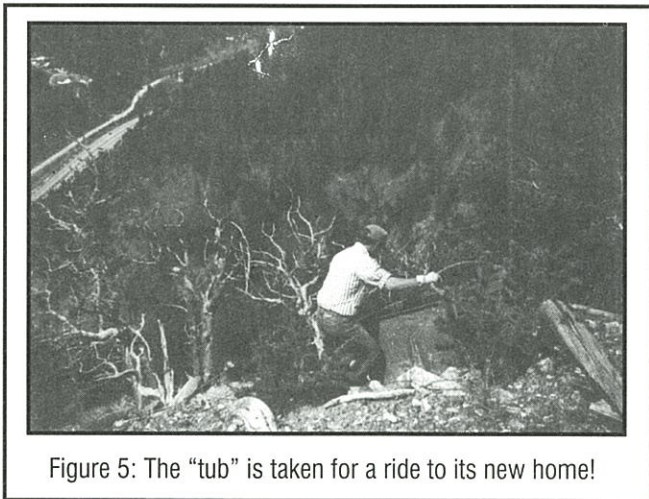


Figure 5: The "tub" is taken for a ride to its new home!

And, if you haven't already guessed, the components shown in figures 1 through 4 were all a part of this uniquely built car. Figure 1 was part of a brake system designed to be engaged by the operator pressing a foot

pedal at the back of the car. Figure 2 was indeed part of the turntable assembly but not as anyone had envisioned it – it was the surface that the turntable swivelled upon and was part of the frame that held the sidepieces (Fig. 3) together (note the unique design of the center curved slots in the side piece – apparently a feature that made the brakes self-adjust as wear occurred on the shoe and wheel). The wheels (Fig. 4) were the only part that had originally been identified correctly – but no one had envisioned the ore car to which they belonged would be so sophisticated. The cast components on the ore car trucks made it very heavy duty. The cost of such construction would have also been substantial – patterns and molds alone would have been a great investment for the manufacturer. Of all the ore cars I've seen from this vintage (many with patents) none compare in areas of design features and durability.

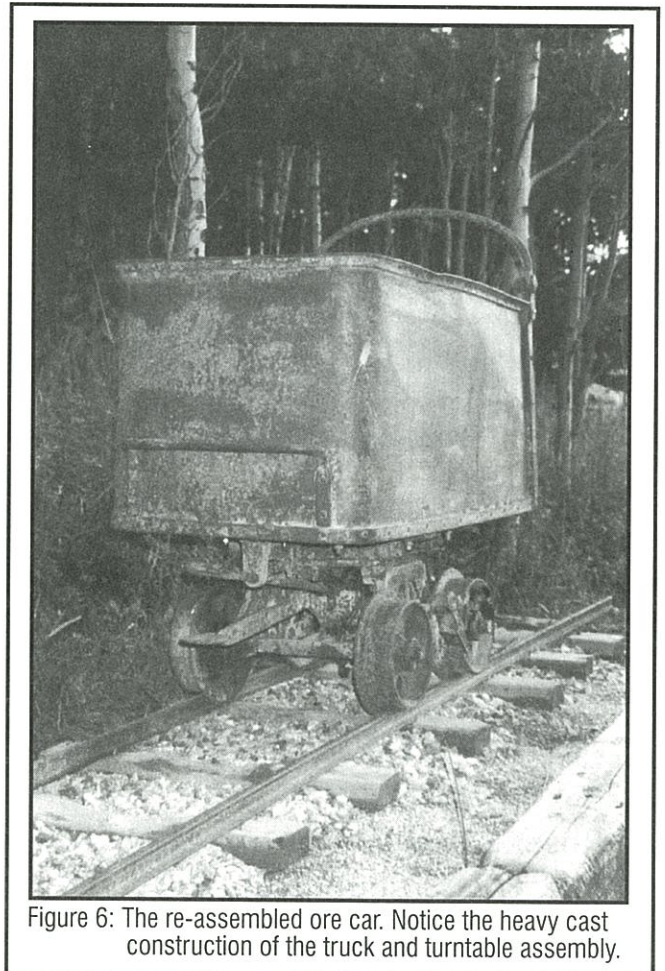


Figure 6: The re-assembled ore car. Notice the heavy cast construction of the truck and turntable assembly.

Unfortunately, there are no identifying marks or evidence of name-tags on the car so its manufacturing source remains a mystery.

Six months (and a lot of blisters) later the ore car was restored and re-assembled at the Rush household. Figure 5 shows Steve preparing the "tub" for its trip to a lower elevation (note the severity of the terrain-those little dots on the "white ribbon" in the upper left-hand corner of the photo are autos on a free-way!). Figure 6 shows the re-assembled ore car.

We have searched old catalogues and articles on the suppliers of this type of equipment but to date have not come up with any advertisements, photos or drawings that show this design or give a clue as to who the manufacturer might have been- So the maker of this particular Rocky Mountain mystery continues to be unsolved!

(Maybe one of our readers will have the solution to the mystery)- Ed. ✕



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BLACK HILLS - ROCKY MOUNTAIN CONVENTION

BLACK HILLS - ROCKY MOUNTAIN MINING COLLECTORS' CONVENTION

JUNE 12 & 13, 1998

Friday, June 12, 1998

3 pm - 6 pm Check-in Holiday Inn Frisco
6 pm - 8 pm Glü-Auf Cocktail Party, Grand Foyer
8 pm - ??? Trades, Sales and Reunions

Saturday, June 13, 1998

8 am - 9 am Set up for Mining Collectibles Show
9 am - 1 pm Mining Collectibles Show and Sale (*Convention Participants only*)
Noon - 1 pm Lunch - On you Own
1 pm - 4 pm Mining Collectibles Show and Sale (*General public*)
5:30 - 6:30 pm No-Host Cocktail Party
6:30 - 8:00 pm Buffet Dinner - Holiday Inn
8 pm - 10 pm Auction of Mining related Treasures

Sunday, June 14, 1998

By popular demand, we are looking for volunteers to provide slide shows or other informational / educational programs on mining artifacts and mining history. Please contact Leo Stambaugh with your ideas on this prior to May 1 and we will try to coordinate schedules for Sunday morning. Other area items of interest include; The National Mining Museum located in Leadville - about 25 miles south. Historic Georgetown should not be missed - and Leo's shop and museum are open 7 days a week. Great shopping there also. To rest your eyes after peering into all those trade cases, there are miles of hiking and biking trails. Don't forget though, Frisco is 9200 feet above sea level and the trails go up from there. There may well be skiing at "The Legend" -Arapaho Basin - the highest ski area in North America. White water rafting should be good. If shopping interests you, the area has a complex of at least 100 factory stores featuring nearly everything except mining artifacts. Many gourmet restaurants dot the area.

REGISTRATION FORM

Please return by May 1, 1998 to reserve a space. See page 30 for details.

Name: _____ Telephone: _____

Address: _____

City: _____ State: _____ Zip: _____

BLACK HILLS - ROCKY MOUNTAIN CONVENTION

HOTEL: The Holiday Inn of Frisco has once again put together a very good package for us. We have a block of 40 rooms at \$61 single or double. Please make your reservations directly with the hotel 1-800-782-7669 and mention the **Mining Collector's Convention**. They have promised to try and place us all together to facilitate Friday night trading. These rates are good for 3 days before and after the show. The hotel has finished with its renovation work from last year which modernized and expanded the facilities.

TRANSPORTATION: Cheap airfares to Denver should be available if you watch for sales. A shuttle service (Resort Express) **is** available from DIA to anywhere in Summit County for about \$30. A free countywide bus system **is** available once you get here. Car rentals are available at the airport. From DIA to Frisco **is** about 85 miles on I-70.

For More Information Contact:

Leo Stambaugh
 PO Box 984
 Georgetown, CO 80444
 (303) 569-2848

Steve Rush
 31112 Shadow Mtn Dr
 Conifer, CO 80433
 (303) 670-9158

Bob Guthrie
 PO BOX 3725
 Dillon, CO 80435
 (970) 468-0405
 rtguthrie@pol.net

SHOW RESERVATION: As sales tables are at a premium, there is a limit of one table or one-half table per participant to allow everyone an opportunity. Additional tables may be made available after May 1 depending on demand.

DIRECTORY: We are planning on publishing a directory of mining artifact collectors with this show. If you are interested, please check below and send a business card to be included. Also include primary area of interest.



REGISTRATION FORM (continued)

Table Reservation for Show	_____	@ \$10.00 per full table	\$ _____
	_____	@ \$ 5.00 per half table	\$ _____
Buffet Dinner and Auction	_____	@ \$20.00 per person	\$ _____
Total Enclosed			\$ _____

Payment must accompany reservations.

Please make checks payable and send to: Leo Strambaugh
 PO BOX 984
 Georgetown, CO 80444

Yes, please include me in the Mining Artifact Collector Directory

TWO DIFFERENT CANDLESTICKS FROM THE SAN LUIS VALLEY OF COLORADO

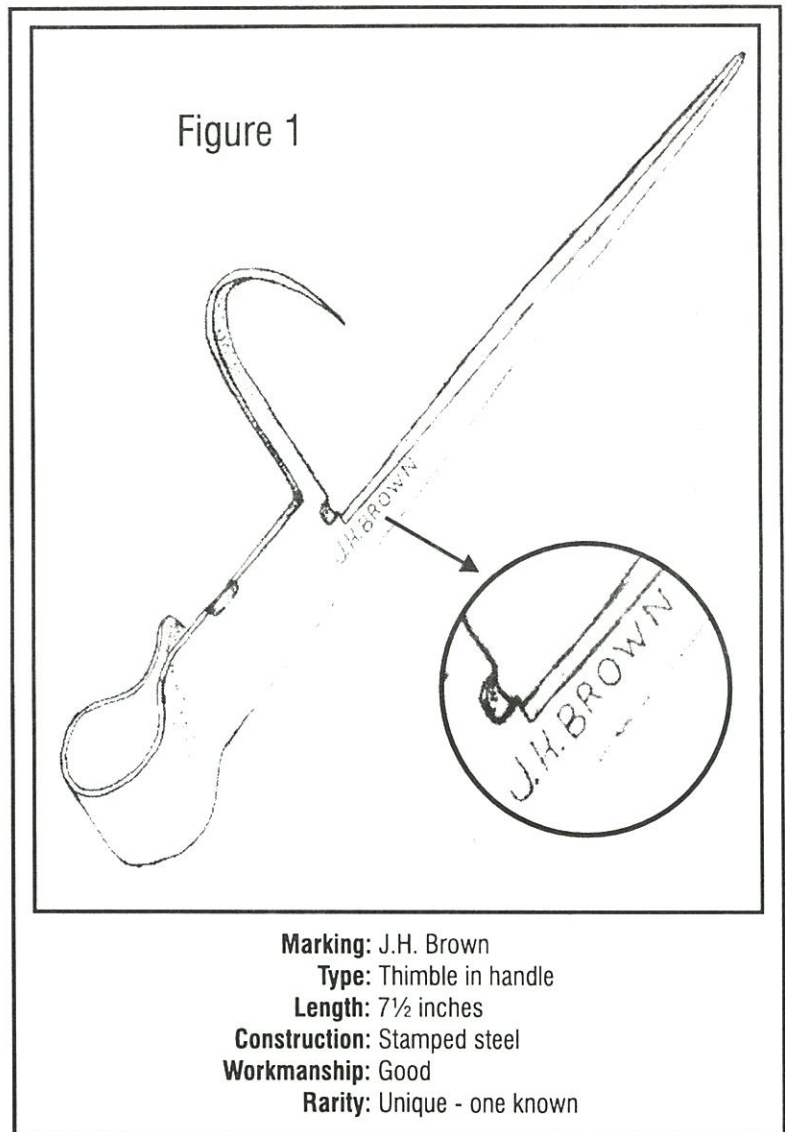
by Roger Peterson

The San Luis Valley of Colorado is a huge basin located in the south-central area of the state. It encompasses approximately 9000 square miles and the southern portion of it spills into New Mexico. From it flows the headwaters of the Rio Grande River on its southward journey to Texas. Some of Colorado's oldest towns and sites are located here: many dating from the 1600's. The valley's biggest claim to fame, other than its absolute beauty, is agricultural and ranching. The basin is surrounded by some of the most majestic mountain ranges to be found in Colorado: the Sangre De Cristos to the east and the San Juans to the west are both well endowed with "14 ers" to captivate your view.

The valley floor has little mining to look upon with the exception of a couple high quality turquoise sites; one at Villa Grove in the northern area of the basin and the other located near the home of Jack Dempsey at Manassa, Co. However, in the mountains surrounding the valley, many metal mining camps existed. Summitville, Creede, Carson, Bonanza, and Crestone are but a few of the towns that existed because of mining activity.

In recent years some very nice and unique mining artifacts have been found at yard sales and in antique shops in the area. The two candlesticks featured in this article both came from such sources. It is assumed that they originally came from mining towns in the area but nothing conclusive has come along to support this with absolute fact.

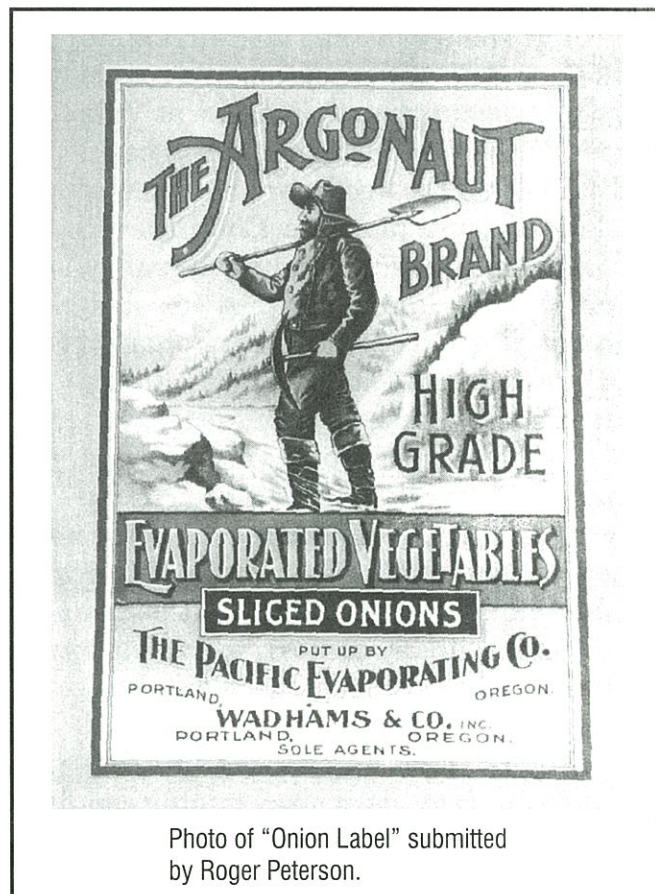
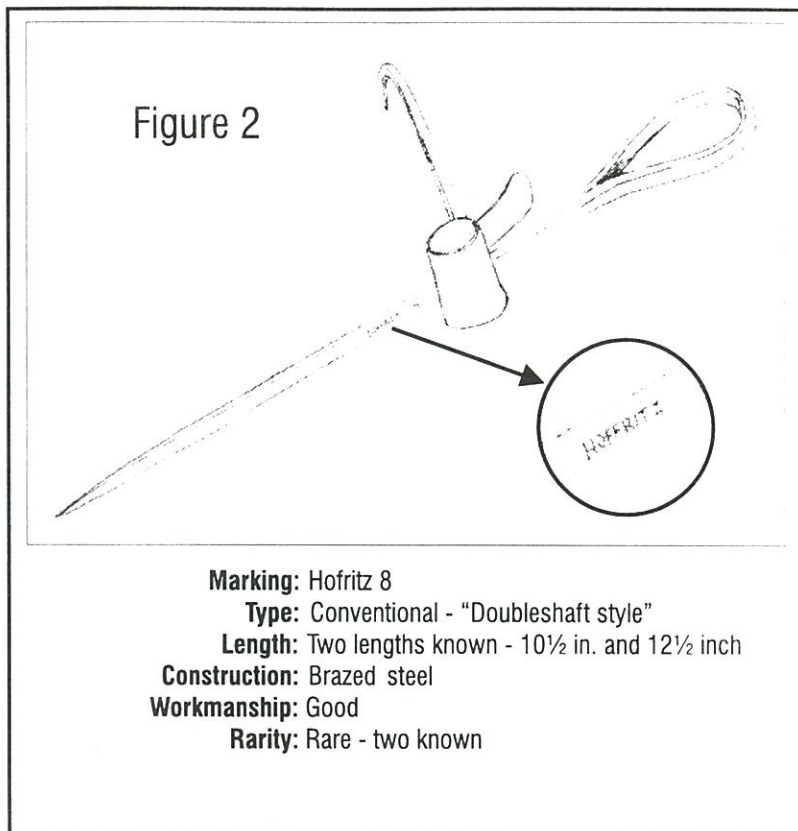
Figure 1 is interesting in that the thimble for a standard sized mining candle is in the handle of the stick. The method of construction appears to be stamping /drop



forging out of one piece of metal. Although the item is very rusty and pitted the edges, thicknesses, radii, etc. all seem to have been very concise and clean-suggesting this item was mass produced (as opposed to being a one-of-a-kind blacksmith model). The gang stamped name (assumed to be that of the Manufacturer) J.H.BROWN as well as the absence of excessive file markings, also seems to support the mass-produced theory. The metal used to construct the stick is very high

quality, with the thimble retaining a high degree of its original “spring” in spite of the rusting that has taken place over the years. The relieved areas on the front of the hook and on top of the handle appear to be a part of the design as opposed to having occurred in the rusting process and may have been the location for a “snap-on” accessory such as an extra thimble, cutter, crimper etc. If anyone has a similar candlestick in their collection I would love to hear from them as to the particulars of their device.

Figure 2 is a more conventional design that also has some characteristics suggesting a mass production approach. Quality of workmanship and material is very good. The seam formed where the handle comes forward to the thimble is a brazed joint (a “double shaft style” as defined in Henry A. Pohns book *THE MINERS FLAME LIGHT*). There is evidence of file work that would indicate each candlestick received individual attention before being shipped. However, many of the radii, bends, edges, etc. are identical on the two known samples (even though they differ in length- 10.5” Vs. 12.5”). This, along with the very cleanly gang stamped “HOFFRITZ 8” suggests a portion of the manufacturing process was controlled and repetitive. Nothing is known of Hoffritz — although it has been rumored there was a mercantile/mining supply company of that name serving the Bonanza District that has not yet been able to be substantiated. Additionally, the significance of the suffix “8” is unknown — it appears on both existing artifacts (which as noted above differ in length). As suggested above, a comment from anyone who can shed any light on the history of these candlesticks would be greatly appreciated. ✕



A TECHNIQUE FOR REMOVING RUST FROM IRON OR STEEL

by J. Scott Altenbach

A relatively simple technique for removal of rust or virtually any surface accumulation from iron or steel objects involves an electrolytic process in an aqueous ionic solution. Materials required are a nonmetal container nearly full of water, table salt (NaCl), an iron or non-alloy steel electrode suspended in the water, a DC power supply with clips on the output and attention to detail. A low charge rate battery charger is a suitable DC supply. *If you have a high-rate charger, pay particular attention to item #5 below! Do this only in a well ventilated or outdoor location! Before attempting this, you need to have a thorough understanding of general electrical principles and electrical safety. As with abandoned mine entry, death is a possibility for the uneducated and unwary practitioner!*



One side of a rusted lid of a California Cap Company tin cleaned by the electrolytic process described, other side untreated.

1). The iron or steel item to be cleaned is suspended in the water bath by the clip on the CATHODE (-). Be careful not to let the copper clip touch the water.

2). The suspended iron or steel electrode is connected to the ANODE (+). Again, do not let the copper clip touch the water.

3). Be sure that good contact exists between the clips and the immersed iron. Some light scraping or light steel wool rub-

bing may be helpful.

4). Turn on the power supply and note that no current will flow. Much to the surprise of many, relatively pure water is a very poor conductor of electric current.

5). *Very slowly* begin adding some salt to the water with constant stirring. You will notice that current will begin to flow as indicated by the ammeter on the power supply and bubbles will begin

to form on the immersed iron. Add salt slowly, *with continuous stirring*, until you have no more than about 5 amps of current. **IMPORTANT! Do not let the current get very high, generation of CHLORINE GAS will result!** Don't dump in a mass of salt all at once. It will gradually dissolve and with a constant voltage DC power supply, you will gradually establish far too much current. If the current gets too high, shut off the power supply and

go back to step 1. **IMPORTANT! Do not attempt to adjust the clips on the immersed objects or remove them without shutting of the power supply. A spark will ignite the oxygen and hydrogen gas that is generated at the electrodes!**

6). Since the object cannot be fully immersed because of the need to keep the clips out of the solution, rotate the object periodically. **TURN OFF THE POWER FIRST!**

7). As the process continues, you will notice that reddish rust or surface accumulation becomes loose and black. Periodic rubbing with a coarse cloth will remove this material easily and you will eventually have an iron object with only a fine, black coating. This can be removed with one of the "rust remover" products like Naval Jelly. ***Be sure to read the instructions for the use of this product.*** Final washing in water and gentle buffing with coarse cloth will reveal a virtually rust and corrosion free object (Fig. 1). This process will not put back iron lost to oxidation and you may wind up with pin (or larger) holes which had been filled with rust!

8). As you will see, the process is highly destructive to the ANODE iron electrode and it will require frequent replacement. ***The same applies to the object you wish to clean if you reverse the electrodes. Experiment on a WORTHLESS, rusty, old can first!***

9). Remember Andy Martin's admonition. Don't do what you can't undo! Remember my admonition. Don't try this on nonferrous objects! This can be disastrous for stupid and uninformed people! ✂

A Little Sound Advice

November, 1917

THE ANODE

7

SHINE 'EM UP BOYS

By John Curran, West Gray Rock Mine

A notable thing among men working in the mines is the unclean and careless way in which they keep their carbide lamps. The result is that an insufficient light is shown with which to work properly, and this sometimes causes serious accidents. Care of lamps is a matter which should have strict attention as good light is one of the principal safety-first considerations.

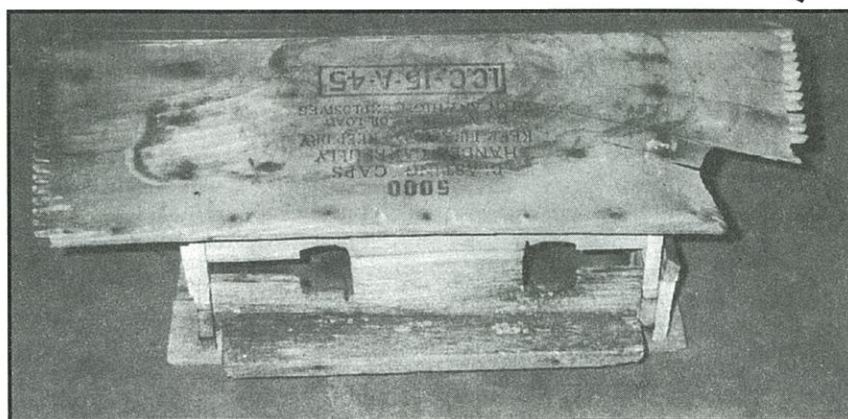
It is only a simple matter to carry a small piece of cloth or cotton in the overalls, and in spare time give the lamp the once-over; the reward will be a much brighter and better light. Another good plan is to unscrew the lamp, and leave it apart in the locker in going off shift. This gives the pad on the inside an opportunity to dry out. Every man using a lamp should have a needle or wire of his own to remove dirt from the burner, and thus avoid the trouble and annoyance caused by continually borrowing from others.

This birdhouse, constructed from a 5,000 count DuPont blasting cap box, was recently found in a dump at the bottom of a waste pile below a mine in snowy Colorado. Though it is far from a museum piece, and probably fits into the category of relic when compared to, say, a candle box in the same shape, I still think it is a pretty neat item from the past.

It brings forth a picture of a grizzled old fellow with a penchant for the natural world around him, and a desire to share his lonely life with birds brought in by his somewhat unorthodox use of an old explosives box. Either that, or he found a unique way to bring in finches to add to his usual table fare of bacon and beans.

Your choice!

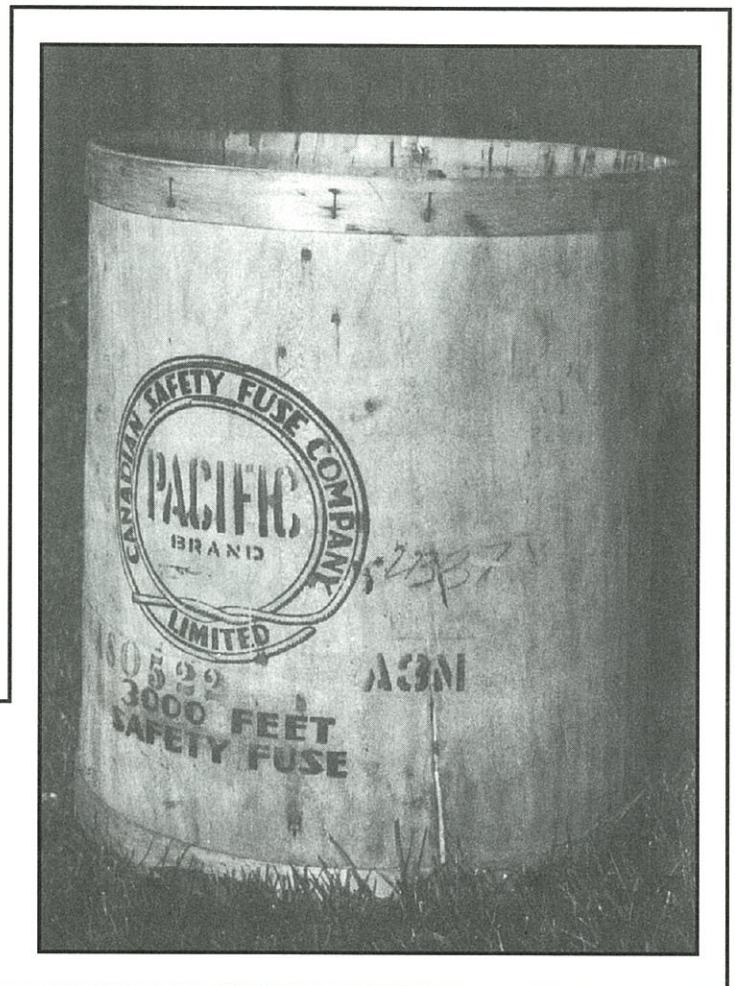
One for the Birds



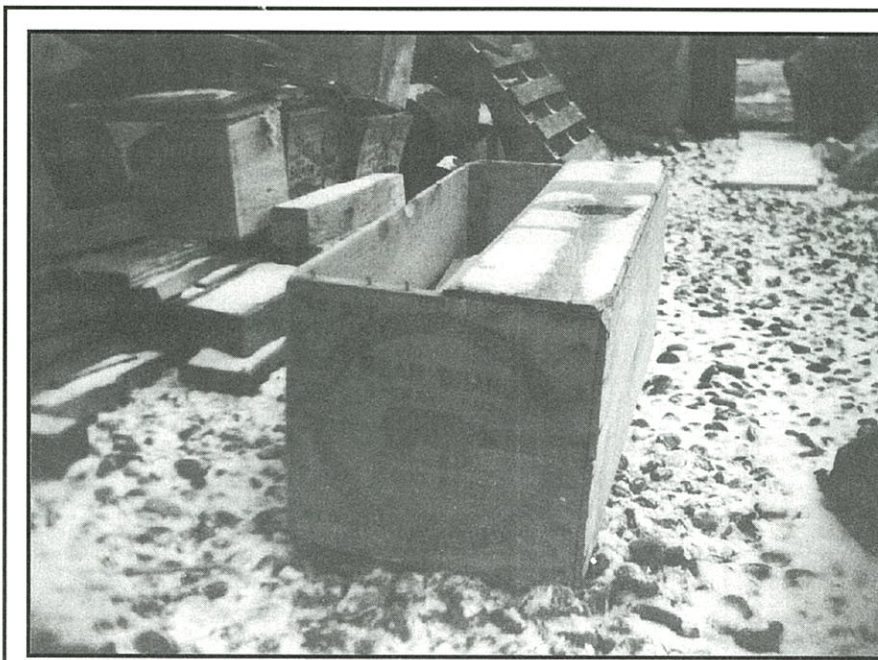
FUSE BOXES

by Lane Griffin

Ever wonder how those paper covered rolls of fuse were transported? Most mining activities consumed large amounts of fuse (you could always load your powder light but enough fuse was much more critical to survival) and shipments were made in lots of usually 3,000 or 6,000 feet. You needed a big box to hold this much fuse and that is what you have if you decide to collect fuse boxes. They're not too practical unless you've got acreage but they are impressive and can store other items, or I've seen just the end displayed. Two examples are shown, a round container from Canada that held 3,000 feet of fuse and a box from Nevada that held over a mile of fuse.



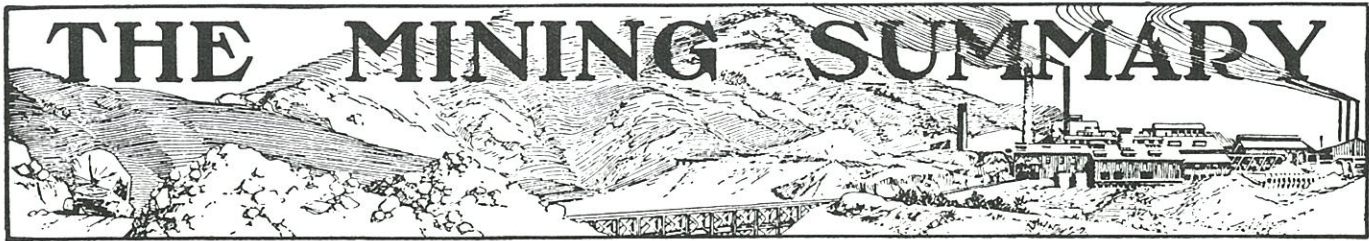
Fuse box (barrel), Pacific Brand, Canadian Safety Fuse Company, East Kootenays of British Columbia. 1920's vintage.
Width = 35cm Height = 40cm.
Made from wood veneer (hat box style).
Submitted by Udo Matern.



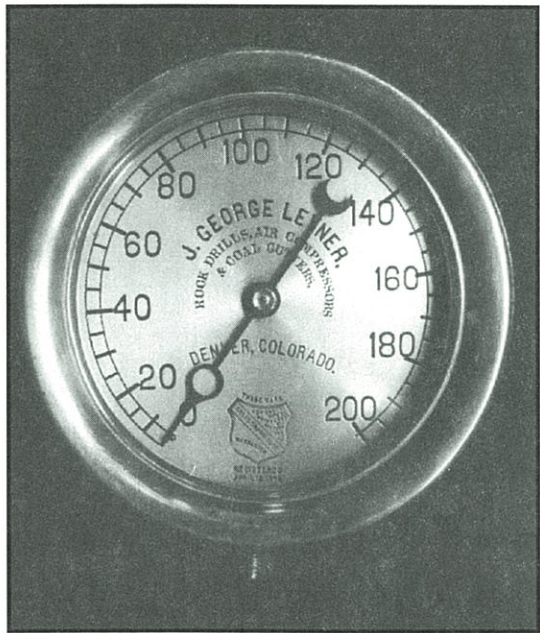
Fuse box, Bear Brand.
Coast Manufacturing and Supply Co.,
Livermore, California
From Nevada, 1918 Vintage

Width = 1.25 feet
Height = 1.25 feet
Length = 3 feet

THE MINING SUMMARY



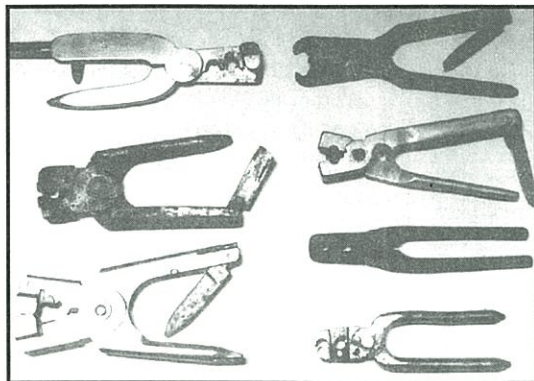
WHAT'S NEW THAT'S OLD



J. George Leyner was the first native born Coloradan to make mining equipment on a large scale. He worked near Silver Plume and patented the first water-fed drill for underground mining, saving untold mines from rock dust.



WMWA ribbons from the Colorado coal fields in Las Aninos County, mostly around Trinidad.



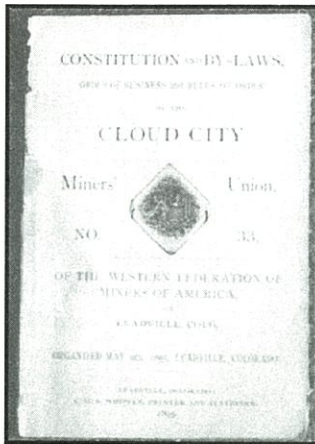
These 7 fuse tools were all sold locally in Georgetown. All but the lower right one were patented in Colorado. Five have fuse cutters and blades, the two lower right ones had chop blades that are missing.



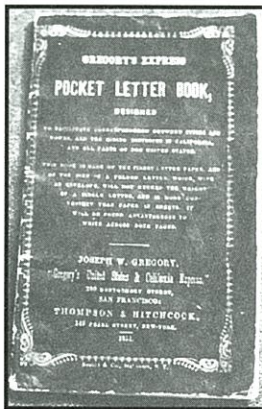
Schneider candle box found near Georgetown in a mine shack, (front & side views). C.S. Mosey was a pioneer Colorado merchant. His early catalogs listed mining candlesticks before he concentrated on groceries and household supplies



WHAT'S NEW THAT'S OLD



WFM booklet of Union by-laws, Leadville, Colorado. The center view is a mining scene.



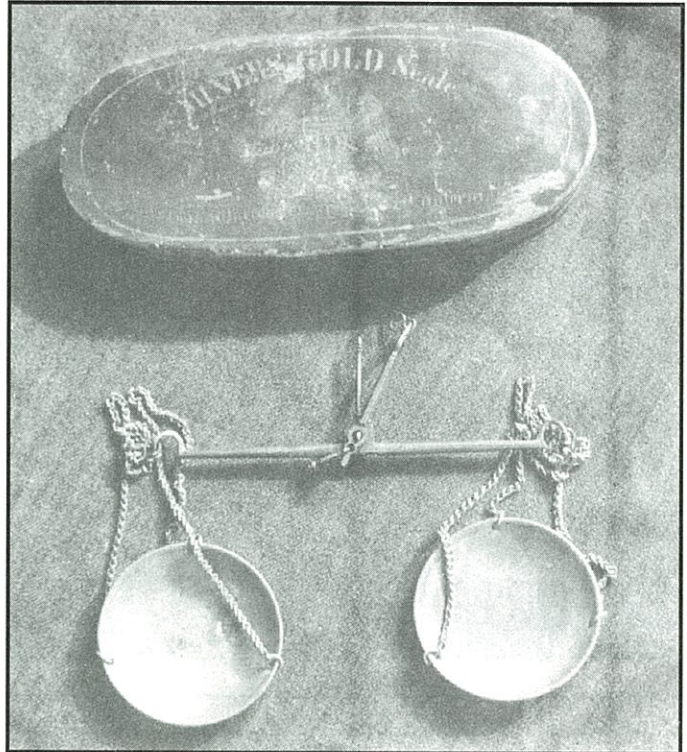
This booklet of letter sheets was sold by Gregory's Express Company, 1851, California. Blank pages to write in and send back to the states. The postmarked covers are very scarce, this book even more so.

Attention, Miners.

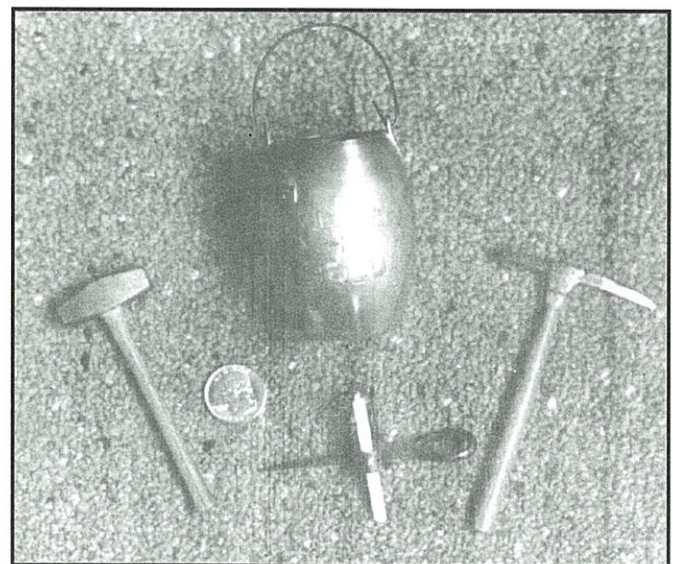
GEORGE W. FORMAN, having severed his connection with the Public Sampling Works, has made such arrangements to ship ore direct to the Golden Smelting Co. as will secure for miners and ore producers from \$3 to \$5 per ton more than they can get in any other market. Call and get prices.

Office in P. O. Building. Black Hawk.

Black Hawk, Colorado roadside found under a framed photograph in Idaho Springs, Colorado junkshop.



Before the Miner's "Improved" Gold scale, manufactured expressly for California, this was the first version, although it's hard to tell what the "improvements" were.

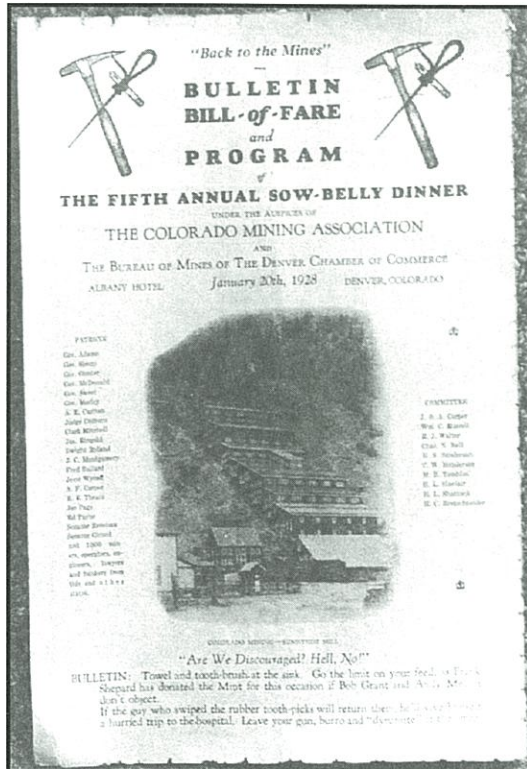


Miniature tools made by H.E. Anderson, Lawson, Colorado. The small bucket was a drilling contest prize.

WHAT'S NEW THAT'S OLD



Four buckles, Buckley Powder Company has been a DuPont distributor since the 1880's. The family was from Silver Plume, Colorado. Some of them still live there.

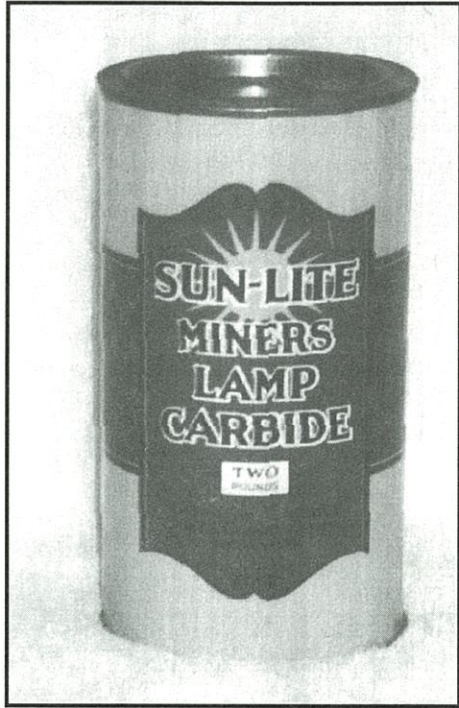


Nice logo on a menu from the Bureau of Mines of Denver Chamber of Commerce.

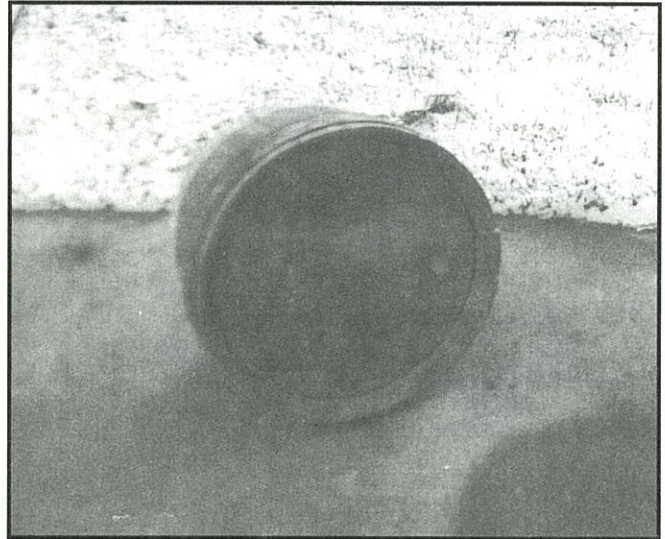


Creede WFM ribbon and Italian Brotherhood of miners for mutual security. Stumptown was a neighbor on the east edge of Leadville, up on the mining district, Candlestick on the bottom.

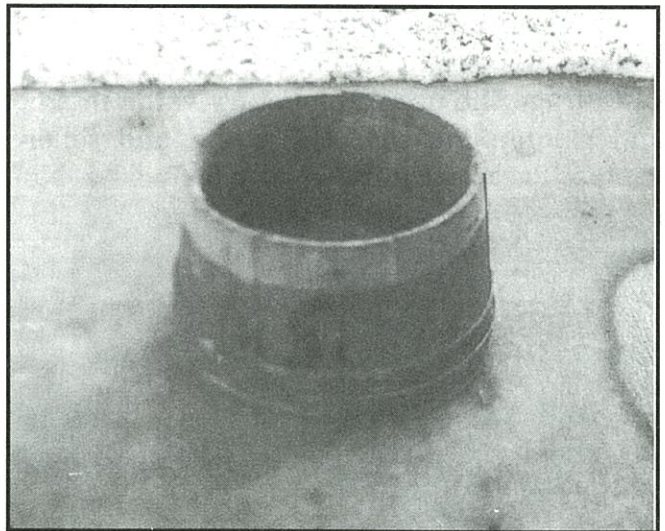
WHAT'S NEW THAT'S OLD



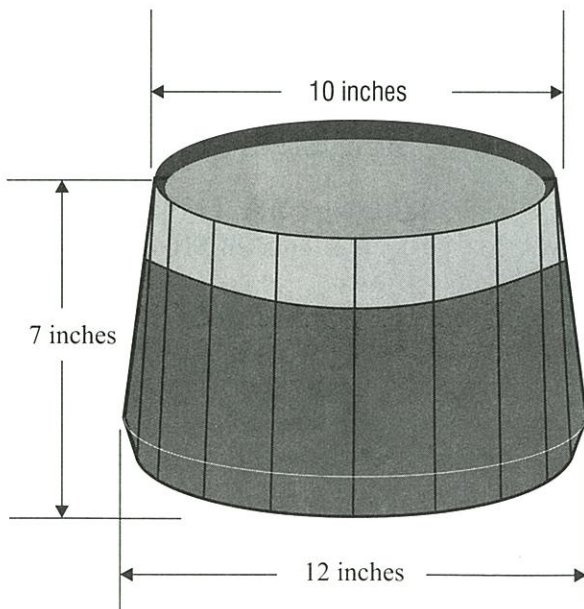
Found in a Denver garage sale — in almost new condition and FULL.

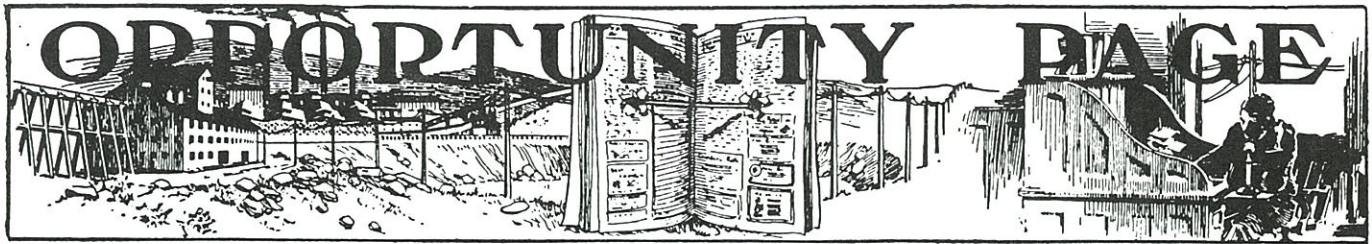


Powder Barrel
Goldfield, Nevada



This wooden barrel staved container is believed to for black powder. Any ideas?
Vintage is 1905 - 1910... ED





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	16 x 20	16 x 24	20 x 30
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Ghosts of Miners Past	\$60	\$75	\$125

Dynamite Boxes \$30 ea.
 Dynamite Box Ends \$7.50 ea. /3 for \$20
 12" x 18" x 9" h. – Finger-jointed edges. Includes lid.

*Safety Nitro Powder Co. Giant Gelatin
 Giant Powder (1892) Giant Eagle
 Candelaria*

Blasting Machines \$ 75 ea.
 7" x 9" x 15" h. Box edges are finger-joined.
Victor Electric Blasting Machine

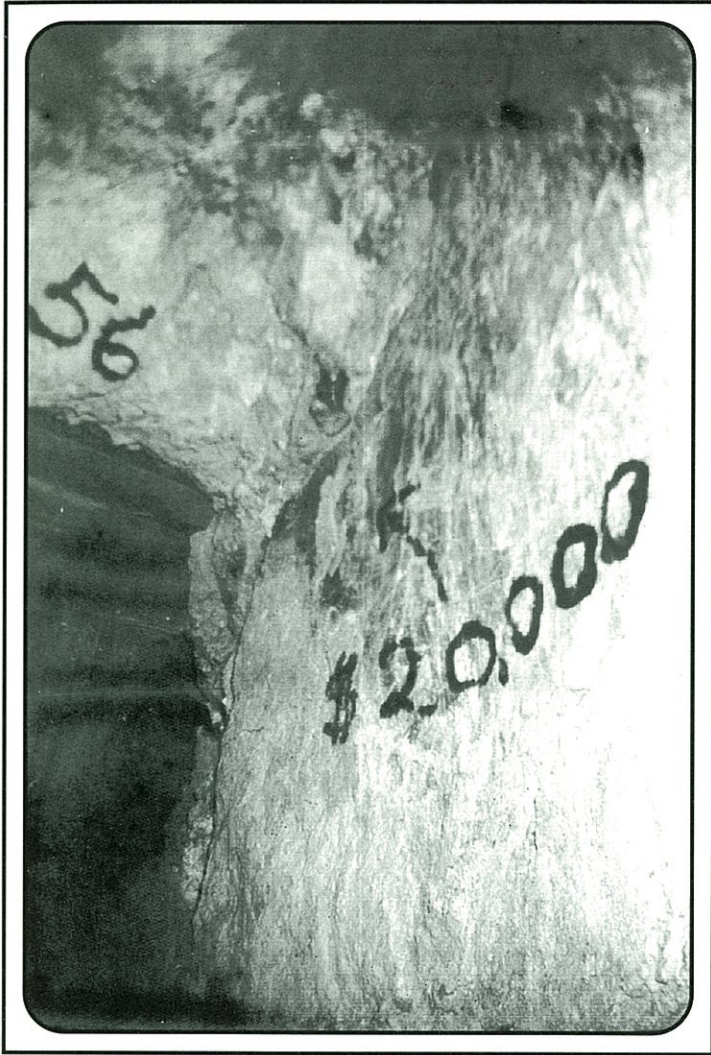
Hats & T Shirts
 All hats and shirts printed black on ash gray.
Safety Nitro Powder Co. –Hats - \$12.50 Shirts - \$16.00 ea. (M, L, XL only)

Shipping Charges

Photos: 16 x 20 & 16 x 24 \$10 ea.
 20 x 30 - \$15 ea
 Dynamite Boxes/Blasting Machines: \$7.50 ea

Hats, Shirts & Box Ends:
 Free shipping for orders that include dynamite boxes - provided all items will fit in the boxes(es). Otherwise please include 10% of total charges for hats, shirts & box ends.





Sous La Terre

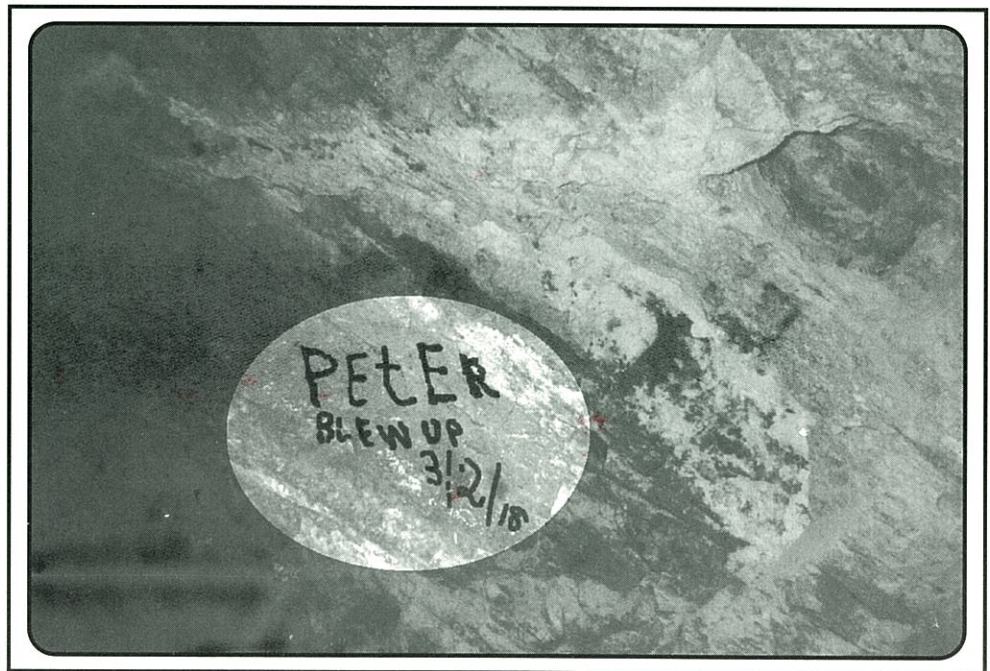
Carbide Scribes

Apparently \$ 20,000 had been
hi-graded from this stope.
Goldfield District, Nevada

And the epitaph reads...



*Photo from the
Blue Bull Mine,
Goldfield, Nevada*



Williams Minerals

Keith and Brenda Williams

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Dutch Hollow Road

Rio, West Virginia 26755

304-897-6003

Toll Free 888-258-5378



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