

THE MINING COLLECTORS' REVIEW

ISSUE NUMBER 2

WINTER 1997



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IN THIS ISSUE

The Essential Pick
Austin Powder Company
Proctor & Gamble Archives

The Really Safe Mine Lamp
Greenway: The Ajo Experience
Tragedy at the United Verde Mine

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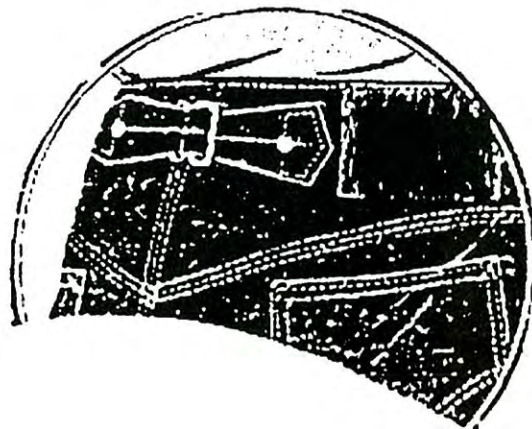
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The Collector's



Mining Review

ISSUE NO. 2

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Early Sacramento Printer
Fresh Fruit - "Better Than Gold" being delivered by
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REVIEW OF MINING



Editors note: The following is a guest editorial from Lanny Ream, editor of the 'Mineral News', July 1996. The subject of mine closure is a controversial one and I think Lanny's comments and insights will give us all cause to reflect on yet another government adventure.

GOVERNMENT MINE CLOSURE PROGRAM—ANOTHER BLOW TO SCIENCE AND MINERAL COLLECTING

Over the last couple years there have been various reports of the U.S. and state governments' plans to close mines for safety and environmental reasons. Unfortunately, this program is ongoing and is proving to be another big blow to science, and of course to our favorite hobby. Both the U.S. Forest Service and the Bureau of Land Management have developed a program. One of leading reasons is safety, another step by our ever growing big government to make the world safe for people who don't think they have to be responsible for themselves. Another reason is environmental; and there are some significant problems here with acid mine drainage and metals leaching into the ground and surface water.

It bothers me that there is no consideration given to science and to mineral collectors or rockhounds. Everyone else seems to have rights, hunters, berry pickers, skiers, bikers and all others, but not us collectors. Yes, it's unfortunate when someone ventures into an abandoned mine and has serious accident or is killed. But why close all mines because of this? Getting national statistics is difficult, but the hazard is quite low. How many have been killed fishing? Many times that in abandoned mines. How many have been killed hunting? Many times that. And the same for skiing, swimming, hiking and climbing, yet I don't see any national push to stop those activities for safety purposes.

The Forest Service program is not fully funded, which is probably the only reason we have any old mines to study or collect in at all. The BLM program is moving slowly too. Some states have funded some major projects and a few important sites have already been lost forever. At this time, the FS program is primarily one of inventorying the mine opening to determine how many and where they are located. From that they will move into a risk assessment based on what can be determined from the surface as to hazards.

Yet, they already are closing some mines. In fact that is what prompted me to write at this time. An article in the local paper-Coeur d'Alene Press-on July 9th covered the closing of some mines in Northern Idaho, in the Clark Fork Mining District, two days later it was reported on the TV news.

Also, Patrick Haynes had sent me a letter (which I received the day before this article) about mine closures in Utah and Colorado. He sent me a copy of an article from the Cortez Sentinel (Colorado) entitled "State to seal abandoned mines around Silverton". The first paragraph reads: "The Colorado Division of Minerals and Geology is beginning reclamation work at more than 250 abandoned mine sites in Colorado, including some in San Juan County. Work will begin this month and continue through the summer and early fall, at an estimated cost of \$588,000."

The article mentions accidents in these mines that caused 17 deaths and 21 serious injuries since 1955. Let's see, for Colorado that's 17 deaths in 41 years which works out to 0.4 deaths per year. Probably about 1\10 th the number from boating or swimming... Perhaps that \$588,000 spent on some other program, such as educating people, or funding a few policeman or taking other actions to reduce violent crimes would save more than 0.4 people per year.

All of us are aware of the many mineralogical discoveries made during those same 41 years by

REVIEW OF MINING

A black and white illustration showing a vintage open-top car driving on a dirt road through a rugged, hilly landscape. The car is carrying a large log. In the background, there are trees and a small structure, possibly a mine entrance or a cabin. The scene is framed by a decorative border.

mineral collectors and mineralogists entering those very same mines, by their own choosing. It will be a shame to see such scientific work come to an end in the San Juan Mountains of Colorado.

Haynes also wrote: I recently went to a mine in Utah which I had not visited in about five years. To my dismay, the road was blocked. Some *%#@ had pried down some large boulders from the canyon's sides that the road was located in. So, I hiked into the mine area, only to find the three mine adits blocked by backfilling and some "Do Not Remove" markers from the Utah Department of Natural Resources' Mined Land Reclamation Division stuck into the backfill. Now, I would not have been very irritated except that I had previously found some potential new mineral species in the mine. These critters are now being investigated by mineralogists overseas (Remember those USGS cut-backs last year.)

"In summation: my tax dollars are curtailing the advancement of Geological/Mineralogical knowledge, instead of promoting it. I would rather see an employed Gene Foord, than to see some petty bureaucrats wasting my tax dollars."

Haynes also wrote: "I suggest that people contact their state Department of Resources, or whatever, and find out what is on your local hit list. Our generation may be the last to have the opportunities of making some unusual field discoveries in any quantity. (In the future, we may have to rely on Russia and China for new species.)

He is correct, we need to take steps to help stop this; we don't seem to have any group working on such locality preservation and must do it individually. Unfortunately it looks like we are constantly being forced to notify some bureaucrats of our interests and scientific needs. One problem is the agencies lack of knowledge—they just don't know, and thus don't consider the importance of mineralogy, or even the hobby interest. Thus, we all should determine if our state has a policy to close abandoned mines, and if

so, notify the state agency of the importance of them remaining open to scientific study, and the popularity of mineral collecting and other rockhounding activities. Also you need to notify your local National Forest Supervisor and the Washington DC office. It may also be helpful to notify your Congressman that you don't want to see your tax dollars wasted on this. These closures shouldn't just consider safety and environment, science and recreation are important too, or maybe we don't have rights anymore.

Otherwise, we may all end up being micro collectors—that may be all that's left... just a few mine dumps and road cuts with a few tiny crystals. ✕



Drawing from the Boston Mokelumne Mining Company stock certificate, California — 1930.

REVIEW OF MINING



We've had great response from the first issue of the 'Review'. Thanks to all those who have subscribed and hopefully we can enlist even more enthusiasts after this non-complimentary issue is sent out. Please don't loan out this issue-make your friends get their own subscription and your copy will stay in good shape.

One of the best ways to stay up on the world of artifacts and mining history besides the 'Review', is Miningcollect, the collective E-mail network consisting of about 45 members. When you post a message on the network it is received by all the other members who can then reply. Its a great way to distribute information and generate interest with other people. Unfortunately it can sometimes turn into a "lampgasm", my term for an overly detailed and extensive exchange of mining lamp information at the expense of all other things related to mining. Occasionally things get a little exciting when some personal laundry gets aired or some 'good natured' ribbing occurs (flaming a competitor).

Last month there was considerable interest among lamp collectors to develop a top ten list of desirable lamps or at least an idea of what to pay for certain lamps. No consensus was reached but several lists were submitted. One list had as its top ten the following: Standard, Anton round, H. Gall, Snell, Klun, S.E. Simmons, Union Carbide, Red Star, W.D. Roof, and Balco. There was also the usual banter between Larry Click and Dave Johnson whereby they exchanged some interesting barbs and trading information. Unfortunately Larry sets himself up for much 'good natured' ribbing from the wits on miningcollect who won't let him forget things like mule tail lamps. Len Gaska has a chat room-like operation going called IRC. Internet Relay Chat is like a conference call using text instead of voice, you see what the other types in real time. Bob Schroth always has plenty of posts usually trying to sell or trade his lamps or cap tins, and is the unofficial master of enthusiasm. There's always an off-color joke or tale of adventure in his quest for artifacts and to be your only friend in the world. There have been discussions about

identifying rare oilwick lamps, removing lamp bottoms, and all sorts of interesting subjects that you'll have to subscribe to enjoy.



Your editor, beer reviewing the 'Review', at the home office near Wabuska, Nevada

As I sit here thinking of the many things we have done at the 'Review' I can't help but wonder what all these great artifacts would look like if they were reproduced in color. There are stock certificates in all the colors of the rainbow, lithographed paper candle box ends that are works of art, or just any artifact would look better if it were copied by a good color process. Now, I know that if I drank enough beer I might be able to envision their color likeness but it also might be a little blurry. Why not put the money we would have spent on beer into a fund to help finance a color issue, there are several rock and mineral magazines that do this. I propose that the 'Review' establish a fund to finance the publication of a color issue at least once a year, I'll keep you posted at the Review of Mining on how we're doing. Send any contributions or comments to the Collectors' Mining Review and specify that it's for the color issue; as a contributor you will receive a thank-you letter acknowledging your tax-deductible donation and your name will appear in the 'Review' along with others that have contributed.

You will notice that there are a couple of flyers placed in this edition advertising upcoming meetings this spring and summer. These sound like very interesting events and seem to reflect

REVIEW OF MINING

the increasing awareness and popularity of mining history and artifacts today. The Tucson event is in conjunction with the mineral show which is an unbelievable gathering of every type of rock, fossil, bead, and mineral enthusiast the world has to offer. The dinner, auction and swap meet sounds like a necessary addition to this carnival of earthly treasures. The Phoenix show will be in April and will be hosted by the Arizona Mining and Mineral Museum. April sounds nice and warm in Phoenix and there will be all sorts of mining displays and mineral specimens for viewing, you might even find H. Mason Coggin waxing poetic. I would fill out the registration form for the Black Hills-Rocky Mountain convention in Frisco, Colorado immediately because I think this will be the most popular of all the gatherings. I used to work in this area as an exploration geologist and can attest to the scenic beauty as well as the thin atmosphere(I wonder if Alma's Only Bar is still there?). I hope everyone will end up attending at least one of these meetings and slap some backs and tell some lies, see you there! ...Lane ✕

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PROCTOR & GAMBLE CO.

Corporate Archives

by Ed Rider

In 1837, Alexander Norris suggested to his sons-in-law, William Proctor and James Gamble, that they go into business together. One made candles, the other soap. It was an ideal merger. Both used by-products of Cincinnati's pork packing industry. Their business prospered through the years and went on to create such American institutions as Ivory Soap and the soap opera.

Collecting the history of a Fortune 50 company began informally in 1957. A company magazine editor with an interest in soap memorabilia was struck by what Ford and Firestone were doing with their historic records. He set up an archives (a closet) and began collecting products, papers and oral histories as time permitted. This part-time approach to archives management changed in 1980. The company had just finished celebrating Ivory Soap's 100th birthday. A draft of a new corporate history was in the works. These projects demonstrated the usefulness of the archive's collections and the need to develop a more coordinated approach to preserving Proctor & Gamble's history. A full time professional archivist position was created in 1980.



Figure 1. Star candle box, 1860-1870, top label identifies the box as property of the Rye Patch Mining and Milling company, active around 1864 in central Nevada, Pershing County. One of the earliest Proctor & Gamble candle boxes.

The Corporate Archives occupies 2,000 sq. ft. of space in the company's headquarters building in downtown Cincinnati with over 1500

boxes of less frequently used material stored offsite in a records warehouse. As is typical in many corporations, the Archives serves as a museum, historical library and archives. Lining the shelves are over 12,000 product samples from German Mottled Soap to Pampers, advertising speeches, press releases, price lists, sales manuals, Norman Rockwell paintings, and copies of all company publications.



Figure 2. Star candle box, side view, note distinctive trademark.

The archives is also the caretaker of the Folgers Coffee Collection of antique silver coffee pots and an art collection of 90 paintings by Cincinnati artists. A photograph collection of over 200,000 images includes factory scenes, executive portraits, soap opera and television shows sponsored by P&G, and a large group of product photos documenting package changes over time.

All of the above has resulted in a growing number of people contacting the Archives for historical information. The Archives receives around 150 requests per month. Approximately 50% are of a public relations nature, either consumers calling in to find out about old products or premiums or requests by the news media for information on the company's history.

The other half of the requests come from inside the company and represent the most important segment of our users. The Archives collections exist first and foremost to help employees reapply the lessons of the past that may be critical to helping move the business ahead. Responding to these business needs is crucial if the Archives

program is to be maintained and expanded. One recent request, for example, came from the department responsible for developing new product ideas.



Figure 3. End piece, candle box from 1890's, found in central Nevada, paper label.

In order to properly evaluate new product ideas, they determined it would be essential to first review past product initiatives that had failed and understand why. The Archives collections were one of the few places in the company that could give them that perspective.

If you are interested in further information about our operations, please contact any of our staff. This includes Amy Fischer, 513-983-9462, Dianne Brown, 513-983-2945, or Ed Rider at 513-983-5443.



Figure 4. End piece, candle box from 1880's, black ink, found in central Nevada.

Procter & Gamble is one company that obviously understands its link to the past and treasures the artifacts that represent the early beginnings of the enterprise. The previous article was excerpted from a description of the archives by Ed Rider, the curator, who has been instrumental in procuring many of the early candle boxes that P&G created to serve the mining effort of the nineteenth century. Luckily, P&G is one of the few

surviving companies that began in candles and has stayed in business in its original form. The box shown in these photos is the Star Candle brand and is currently on display at the Archives department in the general offices in Cincinnati. This box was preserved after locating it near a mine in central Nevada.



Figure 5. End piece, candle box from 1880's, paper label, found in central Nevada.

The writing on top identifies it as coming from a mining company active in the 1860's and according to Mr. Rider this brand was the oldest variety made by the firm. You can see this box being held by Mr. Rider by contacting the P&G Tide web page and selecting the Archives icon. The address is <http://www.clothesline.com>.



Figure 6. Candle wrapper, from 1880-1890, contained six, 14 ounce candles.

Proctor and Gamble candles can be found in mining districts throughout the West and they played a prominent role in mine lighting in the 1800's. Selected box labels and wrappers have been included to show examples of their various styles and logos some of which represent P&G today. ✕



Figure 7. End piece, candle box from 1880's, black ink.

BOOK REVIEW

Firmin Bruner, "Some Remembered... Some Forgot, Life in Central Nevada Mining Camps". Nevada State Park Natural History Association, Carson City, Nevada. 1974, 39 pp notes photographs.

I met Firmin Bruner the day I bought this book and, of course I had him sign it and made some small talk about living in Nevada during the early days. I knew his grandson and talked about meeting him but nothing prepared me for this gentleman, who was in his mid-90's, he was mentally and physically fit and ready for life's next adventure. Unfortunately Mr. Bruner passed away this year, 97 years old, 22 years after he wrote this book and I find it only fitting that we review his writings at this time and put them into perspective.

The author was born Firmin Ascargorta in the Basque region of Spain in 1899. He immigrated to the United States with his parents in 1903 settling in Elko County then moving to central Nevada where Firmin was raised to young manhood. This book details his early family

history especially as it relates to moving to a new unsettled region and the interaction between the Basque people and the other nationalities. He relates many interesting daily events characteristic of mining towns of the time as well as the work necessary to keep the mining activities going. The joys and hardships living and working in the mining camps of Berlin, Austin, and Ione are told in great detail.

This book is especially important now that the ghost town of Berlin has been made a state park and is to my observation one of the most complete, authentic towns left in the West. The house where Firmin used to live is still standing as is the stamp mill and surrounding structures, truly a unique preservation. My recommendation would be to visit the Churchill County museum pick up a copy of this book and then head east to the Berlin State park, by the time you get there you will have read the book and will be absorbed in the life of early Nevada mining camps. This state park also has an interesting exhibit of the fossil remains of giant Ichthyosaurs that inhabited this region millions of years ago. L.G. ✕

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A REALLY SAFE MINE LAMP

by Deric English

Offering something new and unheard of in the field of collectible mine lighting is next to impossible, especially with the eight-hundred and sixty-seven page publication of "The Miner's Flame Light Book" by Henry A. Pohs. Nevertheless, the following lantern might be one that has been overlooked by mine lighting collectors.

The Portable Electric Safety Light Company of Newark, New Jersey promoted the Hubbell Electric Safety Lantern as "the only lamp that is safe under all circumstances". Furthermore, this company claimed light from a Hubbell lantern was "five to eight times greater than the best safeties".

If claims of the Portable Electric Safety Company were accurate, and the product widely accepted by consumers, then there exists an opportunity to find such a lantern. Do any subscribers have more information on this company, lantern, or possibly possess a Hubbell lantern? If so, "The Collector's Mining Review" would enjoy hearing from you.

FRONT COVER

A Really Safe Mine Lamp



Hubbell
Electric
Safety
Lantern

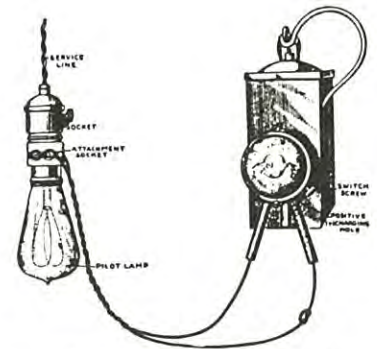
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3 1/4" x 6 1/4" Hubbell Electric Safety Lantern pamphlet, 4 pages.

INSIDE PAGES

THE HUBBELL ELECTRIC LANTERN consists of an alkaline storage battery in a steel case; size 3" square by 6-1/4" high; weighs 5 lbs.; reflector contains a special incandescent lamp bulb on patented supports, all protected from dust and water, furnishing a strong steady 4 c. p. light for 12 hours on one charge.

The Lanterns are connected to the electric service line in the evening for charging, and are ready for use in the morning without further attention. The illustration shows the simple charging arrangements for the care of a lot of these lanterns.

They require no more skill to operate than do flame lamps, while they are considerably more economical in daily running cost. They need to be opened only once a fortnight.

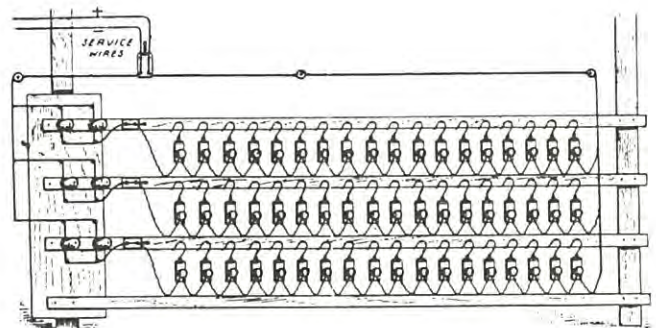
A special form of nut prevents the cover from being opened except with a special tool.

There are no liquids to ship as the materials for filling the battery are caustic soda (a solid) and water.

This lantern by its special construction, IS THE ONLY LAMP THAT IS SAFE UNDER ALL CIRCUMSTANCES, in fact the lighted lamp bulb may be broken in an explosive atmosphere of fire damp or illuminating gas without causing explosion. Light given is from 5 to 8 times greater than the best safeties; mine gases and dust cannot be ignited by it; reflector glasses keep clean; wind and water have no effect upon it; light is not extinguished by jolting.

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Proposals should include an abstract (not to exceed one page) for each paper, plus biographical information about each presenter and session participant. Please send proposals to the Program Committee chair before February 15, 1997.



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THE ESSENTIAL PICK

by Eric Twitty
Boulder, Colorado

The pick is one of the few tools commonly recognized throughout North America as a fundamental symbol of mining. When considered as mining artifacts, picks have a surprisingly wide range of varieties, a fairly simple chronology, and many interesting and rare types.

Different types of mining; placer, hardrock, coal-stimulated the development of specialized picks to meet their specific requirements. Placer mining and prospecting, varieties of surface work, used the common railroad pick which featured one pointed tine and the other flat. For the most part, placer miners and prospectors used readily available common hardware store issues, but for deep clayey soil and thick gravel they modified railroad picks by lengthening and thinning the tines for better penetration and less resistance (Fig. 1). These became known as prospect picks and today are rare.



Figure 1. Top to bottom: Prospect pick, drift pick, poll pick. Two made by Collins & Co., poll pick made with Bealor process.

The drift pick, deriving its name from being used underground to drive drifts, was one of the few specialty tools developed for mining by miners (Fig. 1). Hardrock miners learned that long tines were a major encumbrance in tight tunnels and shafts and the wide blade of the prospect pick was fairly useless. They developed a two-pointed pick with short tines and a heavy swing weight. Hard rock dulled pick points quickly, so they were

brought to a steep almost blunt point, not gradual and sharp as with coal picks.

While coal miners also found a double-pointed pick to their advantage, they did not like the drift pick used in hardrock— it was too heavy and blunt. Coal mining practices dictated production of lump coal (cobble-sized chunks) through undercutting and shearing. An undercut was a horizontal incision under a coal breast and a shear was vertical, and both were up to 6 feet deep requiring a miner to swing his pick with one arm in the narrow gap. The pick that best met these requirements had fine, tapering points, was light, and had a long handle (Fig. 2).

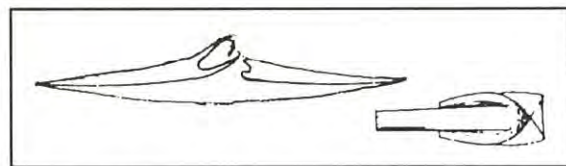


Figure 2. Martin Hardsocg's coal pick patent was a variation of the style known as the Pittsburgh Pattern. Although picks similar in shape date back to the 1870's, Hardsocg's design called for elongated handle shanks which were hammered against the handle to secure it (Pat 492,512). Martin Hardsocg established the Hardsocg Mfg. Co. in 1891 and worked on inventions in his company's shops at least into his 70's! The Hardsocg Mfg. Co. operated until 1969 (Johnson 1992). The Pittsburgh Pattern is the most common type of historic coal pick and is found from Pennsylvania to Colorado, although it is always nice to encounter one made by Hardsocg.

The "poll pick", also known as a "pawl pick" and "pick hammer", became established in mining by the 1870's (Fig.1). Timbermen and trackmen found it especially useful for trimming rock in tunnels and pounding on timbers, ties and rails. The poll pick was popular into the 1910's, after which it was mysteriously dropped by most tool companies from production.

All of the various types of pickheads were manufactured with similar methods which follow a chronology. Until the 1870's blacksmiths hand-

forged all pickheads. The process began when the blacksmith brought a length of square iron stock of his fire and either punched a hole in its center for the handle socket or slit the iron's center and spread it apart. He then hammered out the tines and finished their ends with either a "V" or a taper to one side, and to these ends he forge-welded hardened steel tips, which were longer-lasting than the soft iron comprising the rest of the pickhead. Telltale signs of a forge-made pick include a flat profile with no handle flange, evidence of slits at the apexes of the handle socket, and deformities midway on the tines where the hardened points were forge-welded (Fig. 3).



Figure 3. Two types of hand-forged poll picks. The top pick with its flat profile is most characteristic of hand-forged pickheads; the other pick features an odd profile uncharacteristic of machine manufacturing. In addition, it has slits at the apexes of the handle socket where it was spread. (Author).

These types of pickheads found in the field will exhibit differential weathering between the body and the points.

The first major change to manufacturing techniques began to take form in Newark, New Jersey on February 14, 1873, when Daniel Collins patented the first semi-automatic pickhead machine. Collins' device punched and spread the pickhead's handle socket and drew out the tines with sliding dies; the hardened points were forge-welded by hand in another step. John Klew was second to patent a semi-automatic machine in Pittsburgh on January 1, 1874, which was similar to Collins'. Both methods produced pickheads with crescent-shaped bulging handle shanks (Fig. 4).



Figure 4. Typical features of a pickhead made with the Collins Process. Note the crescent-shaped flange embracing the handle under which are slits at the apexes of the socket. On the left tine is the "Collins & Co./Hartford" gangstamp. (Author)

Collins moved to Hartford and established Collins & Co. which was one of the more prolific makers. Today it is possible to run across pickheads stamped with this name, albeit they are fairly rare. Although patent records reveal inventors including Collins and Klew patented only several other machine-based processes during the 1870's, it is likely that other manufacturers followed suit and became mechanized.

Another significant advance occurred when John Bealor patented a method in 1878 in Pittsburgh by which a semi-automatic pickhead machine, working with a block of hot iron, pushed open the handle socket with a mandrel, drew out the punched steel with rollers, and automatically forge welded the unconnected edges at the apexes of the socket to form a continuous handle flange $\frac{1}{2}$ "-1" high (Fig. 5).

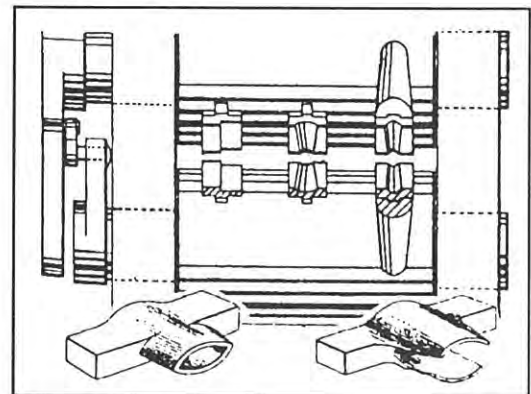


Figure 5. Patent illustrations of part of Bealor's pickhead machine and the stages that created the definitive handle flange. After the machine punched out the handle socket, the excess iron was drawn out in two halves, and the machine forge-welded them together. (Pat. 204,417)

Flanges of pickheads made with this process exhibit rough, uneven rims and crude, smeared seams at the apexes of the handle sockets (Fig. 6).



Figure 6. This drift pick was manufactured with the Bealor process. Note the ragged edge of the handle flange and crude forge-weld where its two halves were joined. The arrow points to the spot where the hardened steel tip was forge-welded onto the end of the tine. It is deformed due to blacksmith-welding and resharpening. (Author)

In addition, the process created seams inside the handles socket's apexes. This was the forerunner in shape of the modern pickhead. By the 1890's it is likely that machine-forged picks eclipsed those made by blacksmiths. By the 1900's many picks captured in historic photos exhibit features indicating Bealor's process was widely adopted, and today more picks made with Bealor's process exist than other forged types.

No matter the manufacturing method of picks, it was the blacksmith who kept them sharpened. Sharpening a pick involved pulling or burning off the handle for easy handling. For the both independent contract miners and large companies, hardrock or coal, this meant having to buy new handles, downtime for the precious tools, and having to furnish replacement picks to use in the interim. The solution to this problem was quite clever: a "mechanical pick" with detachable tines that could be replaced by sharp ones while the blacksmith worked over the dull set. It is unknown who invented the "mechanical pick", but the first patent was granted to Richard Walton at Clarington, Ohio on April 21, 1873 (Pat. 144,803). Walton had a good idea but a poor design-the points of his pick had barbed pins held

in a socket with small set screws (Fig. 7).

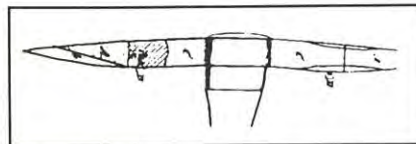


Figure 7. The first mechanical pick which was patented by Richard Walton in Clarington, Ohio in 1873. Pins on the butts of the detachable points fit into sockets in the ends of the tines, and they were clamped in place with set screws. This was a good idea but the design was too delicate and it was subject to dirt and corrosion. (Pat. 144,808)

After a little time in muck, water, and banging on rocks they could have either broken or seized. The second design, much more practical, was patented by Thomas Correll in Canton, Ohio on March 3, 1874 (Pat. 148,038) (Fig.8).

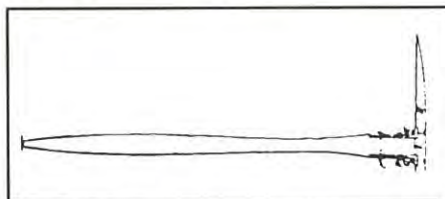


Figure 8. The second mechanical pick patented in 1874 by Thomas Correll in Canton, Ohio. The tines, which were a one-piece unit, bolted to L-brackets which, in turn, were screwed to the handle. This concept was much more practical than Walton's and formed the bulk of mechanical pick patents. Even if the bolts rusted shut, they could have easily been sheared off by a blacksmith. Note similarity of design to the Eyeless pick below; however, unlike the Eyeless model the thin tines suggest it was intended to a coal pick. (Pat. 148,038)

Correll's design called for a detachable tine which bolted to the pick handle. During the 1870's most patents were for replaceable points, while from the 1880's to the 1920's replaceable tine designs outnumbered replaceable point pickheads by 3:1. Joseph Fawkee patented the first mechanical coal pick on February 1, 1876 in Philadelphia (Pat 172,984). This design was similar to Walton's, but the set screw clamping the tines were better and the overall unit was lighter.

A significant advantage of removable tines was the possibility of interchangeable parts

allowing the tool to be converted, such as changing from prospect pick to drift pick to poll pick. This is exactly what some inventors had in mind, as suggested in patent titles or text (patents 522,966; 546,505; 620,077; 938,955; 1,148,633). The first patent for a multifunctional tool was granted to J.L. Woolley in Boulder, Colorado on Nov. 20, 1877. Woolley's tool allowed its removable tines, which had a slight angle, to be inverted for prying (Fig. 9).

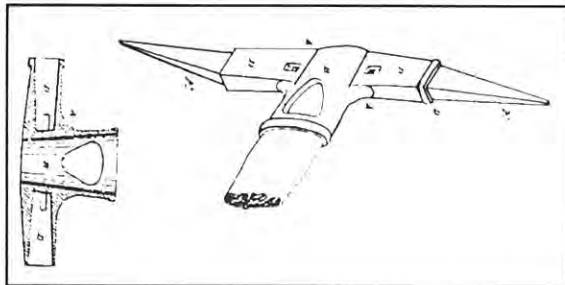


Figure 9. The first mechanical pick specified for multipurpose was patented in 1877 by J.L. Woolley in Boulder, Colorado. Both tines were pointed, indicating it was intended to be a drift or coal pick, and when reversed they could fulfill different functions. Boulder was situated between hardrock and coal mining districts, either of which may have been Woolley's target market.

The first pick with truly interchangeable parts was patented by Ambrose Miller at Hoboken, New Jersey on Jan. 4, 1879 (Fig. 10A and 10B).

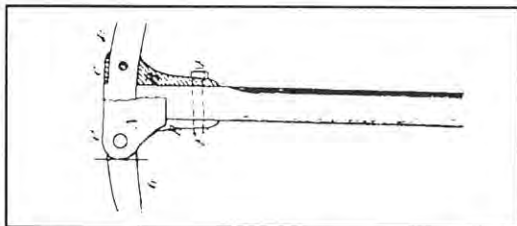


Fig. 10A In 1879 Ambrose Miller patented this mechanical pick. He let the patent lapse and the Eyeless Tool Company filed it in 1894. As the photo of the Eyeless Tool Company's railroad pick and poll pick illustrates, the design was intended to have interchangeable tines, which were riveted between the two plates (Author). The 1879 and 1894 patents were cast into the handle shanks. The Eyeless Tool Company formed in 1894 in New Jersey and successfully made hand tools for a number of decades (New York Office of Corp. Records). Quite rare, Eyeless picks have been seen from Nevada to Colorado.



Fig. 10B

Because of the special parts and machining, mechanical picks were, in the short run, more expensive to purchase than their one-piece counterparts. This put them out of reach economically from most coal miners, who were chronically, notoriously underpaid, but they were well-suited for larger mining companies who, hypothetically, would only have to buy enough units to fulfill their immediate need and supply extra tines or points to keep them in continuous use. In the long run this made economic sense because extra tines or points were cheaper to buy, sharpen, and store than entire pickheads.

The number of mechanical pick patents reached its peak between 1890-1915 with approximately 1 to 2 filed per month; by the 1920's the frequency dropped to only several per year. It is unknown how many mechanical picks were actually sold on the market, and what is clear is that a large number of unpatented models were produced, indicating a fair demand in the pick market. The upswing of mechanical patents from the 1870's into the 1900's reflects the trend of increasing innovation and mechanization in North American mining during this time, and the drop off in the 1920's may reflect a change in mining toward heavy mechanization and away from labor intensity.

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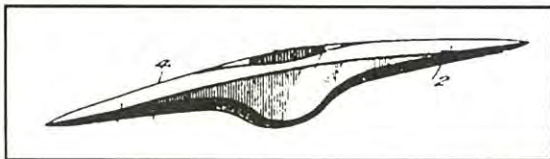


Figure 11. The author has seen a sample of this odd design in a Colorado coal field antique shop. It was one of the few nonmechanical pickheads patented, in this case by John Chevellard in Millersburg, Ohio in 1904. (Pat. 198,277)

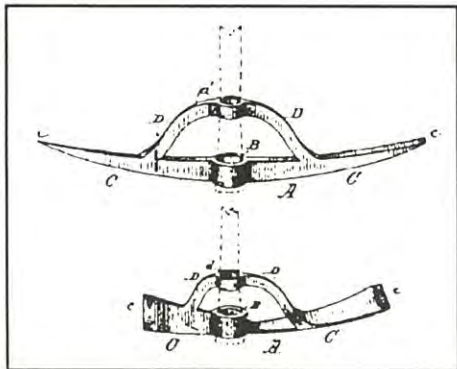


Figure 12. Was this odd pickhead ever made? The compound shape could only be created if the arched handle brace was forge-welded onto the body or if the entire pickhead was cast. The arched brace reinforced the handle's weakest spot which was where it joined the pickhead. The drawbacks to this design were that it required a special handle and it was more expensive to make than simpler counterparts. (Pat. 369,921)

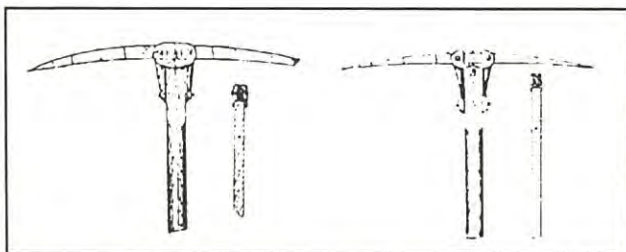


Fig. 13 These mechanical picks, variations of Miller's 1879 patent, were patented by the Eyeless Tool Company in 1892. The fact that patents were renewed in 1894 suggests they reached production. (Pat. 524, 818; 524,819).

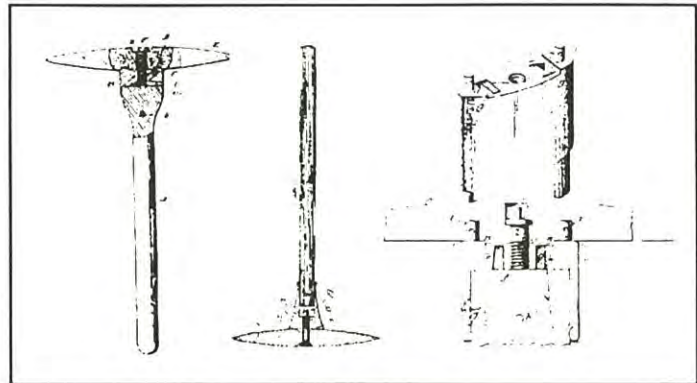


Figure 14. This series of patent drawings illustrates a common trend with mining equipment whereby a series of inventors improved or altered previous designs. In the case of these mechanical coal picks, the first design was patented by Andrew Moats in 1886, the second in 1888 by Hiram Stouffer, the third by Isaac Price and John O'Mealia in 1900, and there are other variations not shown here. Most of the differences are in the handle shanks, allowing the tines to remain interchangeable between the models. Relatively common interchangeable tines would have made these coal picks more marketable. (Pat. 356,512; 400,803; 659, 101).



Figure 15. An exploded view of yet another variation of the Moats design, and sharpened replacement tines. Its manufacturer is unknown, and it has "1 11 12" cast into its handle flange. At some point this design was purchased by the Hardsocg Mfg. Co. which replaced the "1 11 12" with "Hardsocg". This design is probably the most common historic pick existing today.

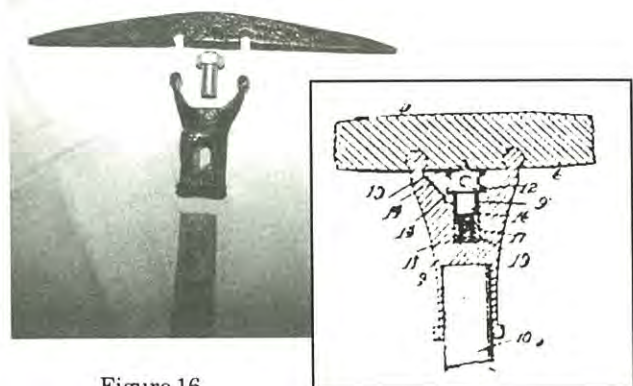


Figure 16

Figure 16. Compare the patent drawing of this mechanical coal pick, patented in Hocking, Iowa by Alfred Bohy in 1912, with the photo of the production model-there is very little difference. The handle shank is made of cast iron and subject to breaking, as indicated by the brazened fractures on the production model and the points on its tines are forge-welded hardened steel. Its maker is unknown. (Author; Pat. 1,022,924)

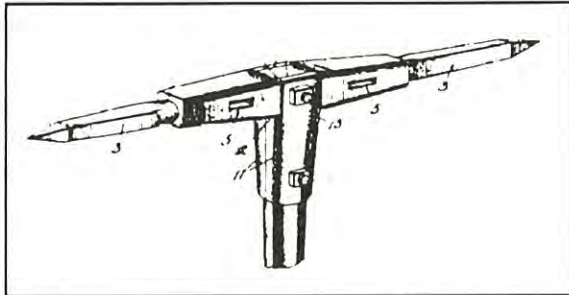


Figure 17. Looking more like a machine, this mechanical coal pick was patented by Bud Laughhunn in Centralia, Illinois in 1904. The handle bolted on and the points had tapered butts that fitted into corresponding sockets in the ends of the tines. To remove them a blacksmith pounded hardened steel wedges into the slots in the tines, pushing the points out. A fascinating but expensive design. (Pat. 773,507)

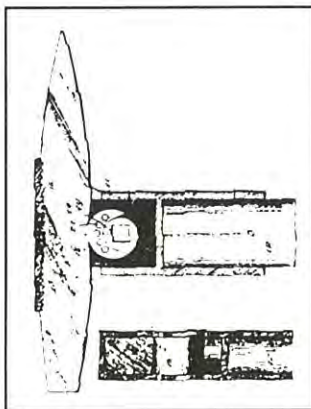


Figure 18. Another Martin Hardsocg patent, this one granted in Ottumwa, Iowa in 1903. The top of the tine was forced against the toothed plate by a cam turned with a wrench. Although this pick would have been costly, the tine could have been changed in seconds. Was this model ever made? (Pat 759,704)



Fig. 19

Figure 19. This mechanical coal pick features push-in points and partly machined and partly welded construction. The welds suggest post-1920's manufacture. Cast into the handle shank is "Blowdil", presumably its maker. Models identical to this, and others with screw-in points were also made by Hardsocg. Samples of the Hardsocg version have been seen from Pennsylvania to Colorado. (Author)



Figure 20. The maker of this mechanical railroad pick from Jackson in California's Mother Lode is unknown and it was not patented. When assembled, the notch in the top of the tine seats against a corresponding pin, and the entirety is bound with the steel wedge. (Author)

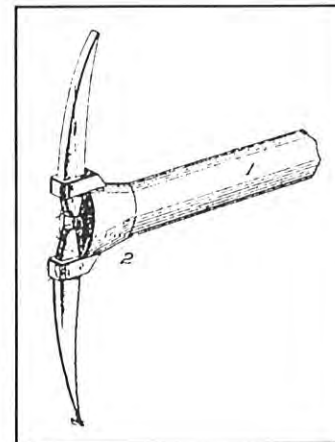


Figure 21. The Author spotted this mechanical railroad pick several years ago in Columbia State Park in California's Mother Lode. It was patented by George Lucas in 1899 in nearby Valley Springs and was another design that made it into production. The tines of the production model were longer than most other railroad picks, suggesting it was intended for prospecting or placer mining. (Pat. 646,441)

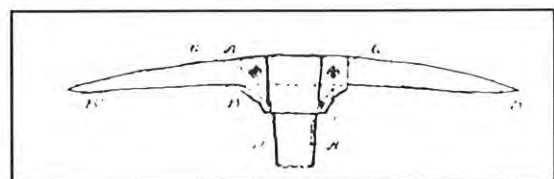


Figure 22. George Singleton's 1898 drift pick patent was another design that saw production; one being seen by the Author in a Colorado mining town antique shop. This design was very practical with the handle shank bolting to a one-piece tine. (Pat. 613,729)



Figure 23. Note the similarity of this mechanical pick to the Eyeless model-construction is nearly identical, but it is unpatented. It probably also had interchangeable tines. The logo cast into the bracket is that of the Ames Tool Co. which operated in the early part of the 20th century. (Author)

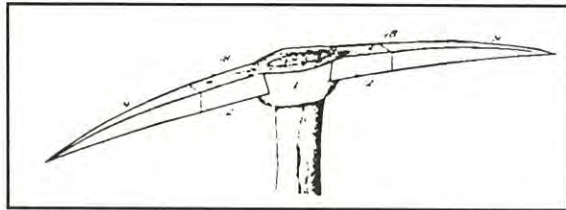


Figure 24. William Kelso of Butte, Montana, patented this drift pick in 1897. Like Walton's 1873 patent, the butts of the points fitted into sockets in the ends of the tines. Kelso's design called for malleable iron pins instead of set screws to hold them in place. The draw-back was that a blacksmith had to extract them to change points. (Pat. 588,339)

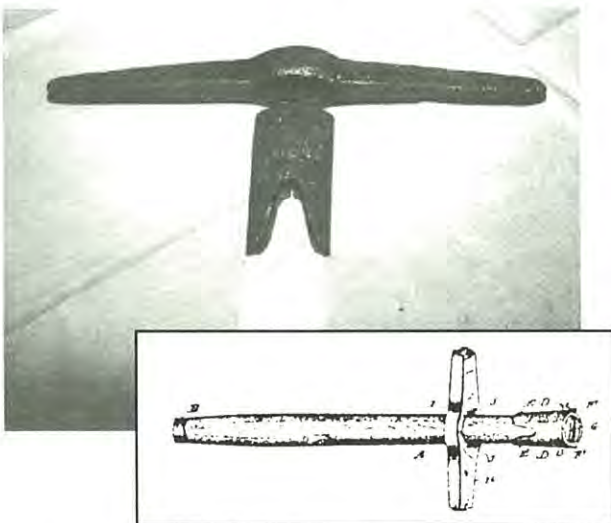


Figure 25. Another approach to changing pickheads without destroying the handle involved an iron sleeve around the pickhead's contact spot, reinforcing it, protecting it from wear, and firmly holding the pickhead. Tinkers and inventors patented less than 10 variations on this theme between 1872-1925, and probably fewer were actually manufactured. John Cook patented the first such pick in 1884 in Drifton, Pennsylvania but the production models were made by Park & Co. in Wigan. The production model is nearly identical to Cook's patent, except "Park & Co." is gang-stamped into the sleeve where the pickhead seats (Pat. 302,109; Author) The double points indicate the pick was intended for mining, and its size could have been used in coal or hard rock.

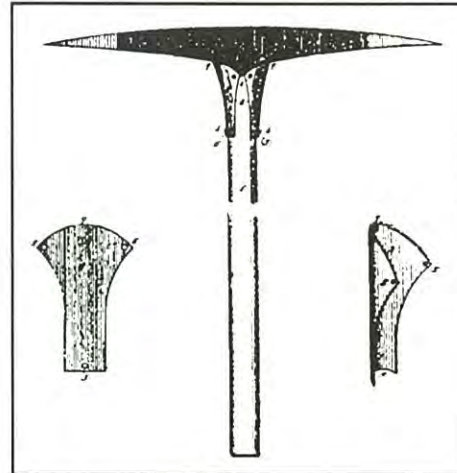


Figure 26. George Schoettle patented a practical two-piece sleeve for mounting Pittsburgh Pattern pickheads in Collinsville, Illinois in 1890. The corners of each plate had holes for screwing to the handle. (Pat. 458,528)

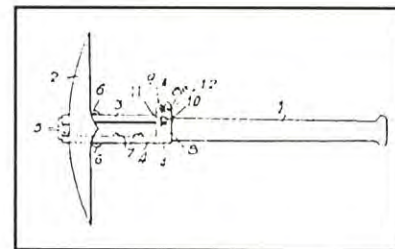


Figure 27. This sleeve for coal picks is a mechanical version which clamped around the end of the handle and featured a locking hasp secured with a bold. Ashbell Willard patented this in Benton, Illinois in 1917. (Pat 1,248,993) ✕

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TRAGEDY AT UNITED VERDE MINE

by Deric English

Like many accounts of mining disasters, the tragic cave-in at the United Verde Mine in Jerome, Arizona presents an opportunity for one to sense the human toll exacted during these disasters. Viewing these tragedies only in terms of the number of casualties robs us of insight and a heightened sense of our own humanity. When histories, families, and names are linked with the departed, one will likely engage in a somber moment of reflection.



Survival of a miner was as precarious as Jerome's footing on the side of Mingus Mountain. The miner, as well as the town of Jerome, was obligated to join forces when facing cave-ins, sliding buildings, fires, and other hazards thrown before them by this past upheaval of rock from the Verde Valley floor. This central Arizona locale of unpredictability was the location of the 1905 United Verde Mine cave-in.

The cave-in at United Verde occurred around 4:00 a.m. Sunday, April 2, 1905. It took place in old workings when recent rains saturated surrounding ground, loosening the ground around old timbers, and adding enough weight on them to cause a cave-in. The cave-in weakened the bulkhead at the 300-foot level, unleashing hot air, steam, and deadly gases upon the miners.

The miners were not entirely overcome by the gases, and scattered in all directions, fleeing the mine through the 300-foot level tunnel. Others were hoisted to the surface from a new shaft. All of the miners incredibly walked from the mine to the hospital, except two who were carried down on stretchers.

The miners were terribly burned, their skin peeling from their bodies. The stench of burnt flesh and whispered moans of agony filled the air. Their hands received the worst burns due to the instinctive raising of hands to protect their faces from the inferno. Those that inhaled the deadly fumes were the worst sufferers. Among them, F.W. Crawford lived eight hours after the cave-in, E.R. Duffin, Peter Serdar, Joseph Wendovich, and N. Lazovich died within the next two to three hours. Barney Caranto survived for two days until passing away on Tuesday morning.

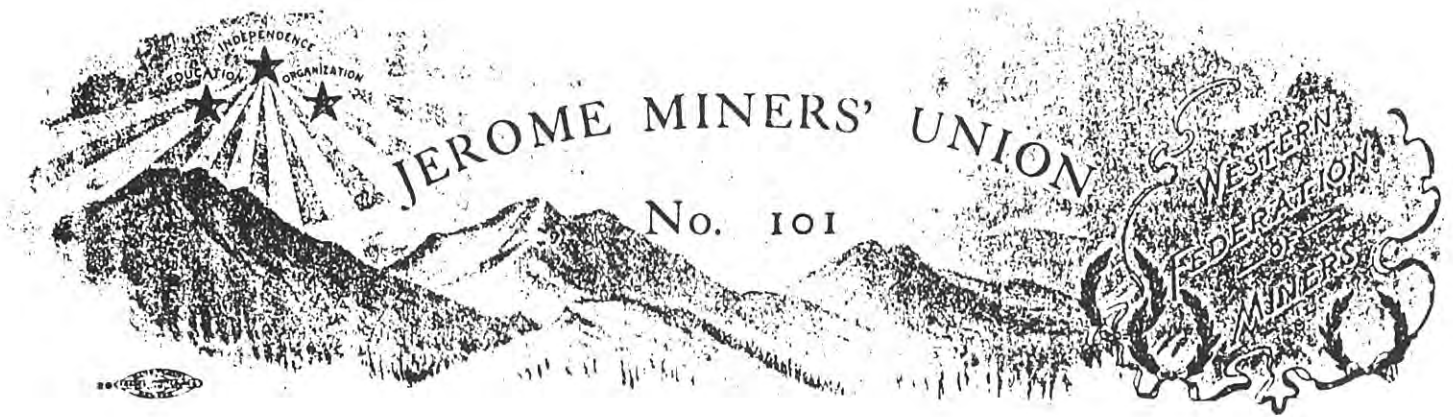
Six other miners were injured, but escaped death. They were J.D. Rose, John Rose, C. Garcia, John Holman, N. Kostich, and Tim J. Sullivan.

Monday night the Jerome Miners' Union called a special meeting to appoint a committee to consult with officials of the United Verde Company regarding burial of the deceased miners. On the following day the Miners' Union invited the public and Serbian Society to a meeting where funeral arrangements for the deceased would be discussed.

On Sunday, Monday, Tuesday and Wednesday all flags in Jerome were at half-mast and during the hours of the funerals on Tuesday and Wednesday every business in Jerome was closed. On Tuesday between six and seven hundred people were in the funeral procession. The United Verde closed down after noon so that the miners might pay their last respects to the departed.

Tuesday morning, April 5th, at 7 o'clock the remains of E.R. Duffin were escorted to the U.V.&P Ry depot where they were shipped to his parents in Utah. E.R. had been in Jerome for only a short time, but had made many friends. He was a friend of Superintendent McDermott, who was instrumental in having his remains sent near St. George, Utah.

In the afternoon Peter Serdar's funeral was held in the Scott Undertaking room. He



April 5th, 1905.

W. O. Emery. Sec-Treas:
Mojave Miners Union.
Dear Sir and Brother:--

I have your letter of April 1st with \$5.00. for transfer of Thos Fahey for which I enclosed receipt. As to the transfer of B. Vogel, I can assure you that it calls for \$5.00. and I would send you the transfer for proof only for the fact that my quarterly report goes to the Finance Committee on to-morrow and it is necessary that I have all my vouchers, etc for their examination. When you forward the difference of \$3.00. I will receipt for the amount and credit Vogel for it on account.

I have not been able to answer your letter sooner being very busy with the funerals of six miners killed in the mine on the 2nd. The night shift were at the 250 and 300 levels waiting for the cage to go on top when one of the burning stopes caved from the surface and the impact blew out the bulkheads and filled the stations with red-hot gas etc scalding the boys in a horrible manner. It all happened and was over in less than half a minute. Six are dead and six more in a dangerous condition. We shipped one named E.R. Duffin to Utah, buried P. Sirdar, N. Lazovich and J. Wenovich yesterday and on today will bury F. Crawford and B. Caranto. The mine broke out last night with flame and gas coming through the surface openings. It seems to be a veritable volcano at present. After a while the fire will be confined with new bulkheads and things will go on as before but so many of the miners are leaving that our membership will dwindle and we will have to begin all over again as we often had to do in the past.

Yours fraternally,

Albert Ryan Sec.

was about 26 years old and was the sole support of his widowed mother in Austria.

At the same time and in the same undertaking room, the Joseph Wenovich funeral was held. Joseph was about 39 years old and a member of the Serbian Society. Fellow members of the Society escorted his body to the grave.

Like the funerals of Serdar and Wenovich, N. Lazovich had his funeral in the Scott Undertaking room. Lazovich was about 35 years old and was survived by a wife and children.

Wednesday afternoon, April 6th, the body of Barney Caranto was laid to rest beside his comrades in the city cemetery. Barney was a member of the Western Federation of Miners and the United Mine Workers of America. He was married.

On the same day, April 6th, F.W. Crawford was laid to rest in the city cemetery. F.W. was a 29-year old Nova Scotian from Westville, Picton County. After an absence of four years, he had returned to Jerome about three months prior to his death. He had spent these four years in Victor, Colorado and Cananea, Mexico.

These fallen miners of Jerome's United Verde Mine are only a few of the many miners that have met untimely deaths in the depths of the earth. Let their story stand as a reminder of the others. And maybe, while raising your flag on Labor Day, you might pause for a moment and reflect upon how we all have benefited from the sacrifices and contributions of miners like them.

Sources

"A Cavein At The United Verde Mine," *Jerome Mining News*, 10th Year, No.29, April 8, 1905

Letter from secretary of Jerome Miners' Union to the secretary of Mojave Miners' Union. (author's collection)

*Copy of Jerome Miners' Union letter has been re-typed for visual clarity. ✕

MINING ARTIFACTS FOR SALE OR TRADE

1. Hughes Bros. Fireboss Davy-style lamp w/copper wind shield used hard but complete.
2. American Safety Lamp & Mine Supply Davy with steel top in very good + cond.
3. Early unmarked Davy lamp with cylindrical font, probably English-good cond.
4. Trethaway Bros. Tin oil wick lamp, tin cylindrical font, domed shoulder, flat lid, brass collar-excellent cond.
5. Dunlap driver size oil wick lamp-excellent condition.
6. Crown slope-sided face lamp, tin with brass collar, fully copper lined-excellent cond.
7. Unmarked Trethaway Bros. Slope-sided face lamp w/brass collar & vent tube & dbl.-walled spout-exc.
8. Tin, cyl. Font, domed shoulder-collar, dbl. Hook from single stock "Pat'd Nov. 15, 89" on hook-exc. Cond.
9. Early style Buddy carbide cap lamp, missing cap brace, OW in very good condition
10. Justrite Streamlined carbide cap lamp, mint, unfired in original blue box w/ instruction sheet
11. Justrite Streamlined carbide cap lamp, mint unfired w/ instruction sheet in base
12. Auto-lite carbide cap lamp, orig. red bumper grip on base, in orig. box-lamp slightly used, box v. good
13. Justrite horizontal, later style, complete & in very good cond. w/ all brass reflector
14. Justrite horizontal, later style, complete & in very good cond. w/ NP brass reflector
15. Lenticular (tunnel) lamp circa 1870's, sheet steel, stamped & crimped construction, wire bail-good + cond.
16. Taylor & Boggs Furnace Lamp, cast iron font & spout, wire bail, zinc screw lid, orig. black paint-v. good
17. Justrite 8-hour lamp w/mint 8" reflector, rear flat hook, bail w/homemade hanging hook-v.good + cond.
18. Tin "Guy's Dropper" carbide bottle-style flask-good cond.
19. Shanko brass carbide container with lid-v.good cond.
20. Several safety lamp globes etched "Wolf Special No. 1 Made in Germany"-new old stock
21. Davis Instrument Co., Baltimore, Md. 4" dia. Early brass anemometer w/ wooden handle & leather case w/cut-out(orig.) to allow for leaving handle mounted to instrument. No reset lever, two small dials in one large.
22. Jos. G. Pollard dip needle, mostly alum., in orig. leatherette box-exc. cond.
23. Ten shot twist blaster by Fidelity Electric w/Atlas Chemicals-Explosives tag on side, complete-exc. cond.s
24. Wm. Scholhorn Co. U.S. blasting cap crimpers, steel construction-v.good + cond.
25. Pair of American Cyanamid cardboard boxes (~5"x9"), "25 8ft Copper wire Delay 1 Electric Blasting Caps"
26. Grasselli Zinc 100 No. 6 blasting cap tin-good to very good cond.
27. DuPont No. 6, 25 caps, style "B" blasting cap tin-very good cond.
28. Trojan Powder Co. checkerboard w/ great graphics on back & blasting instructions-fair to good cond.
29. Leonard 2-1/2 quart tin lunch kettle, wire bail, wooden handle, unusually large size-v. good cond.
30. UMWA ribbon from 3rd triennial convention, Dubois, Pa. 1918, mint, on orig. Whitehead & Hoag card
31. Small diamond scale, NP, complete(including all weights) in walnut box, tweezers w/scoop on end-exc

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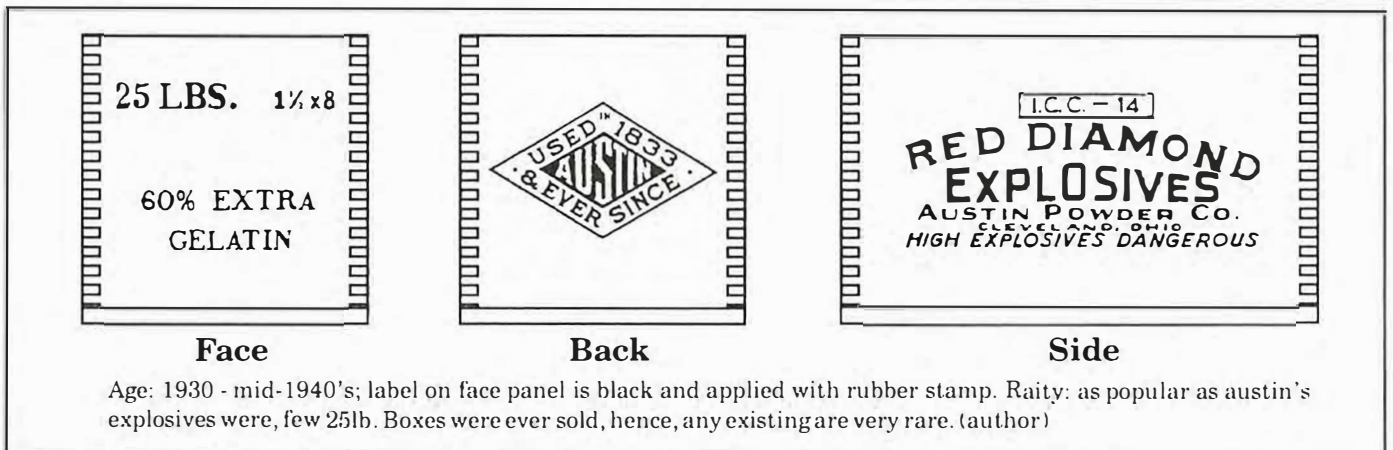
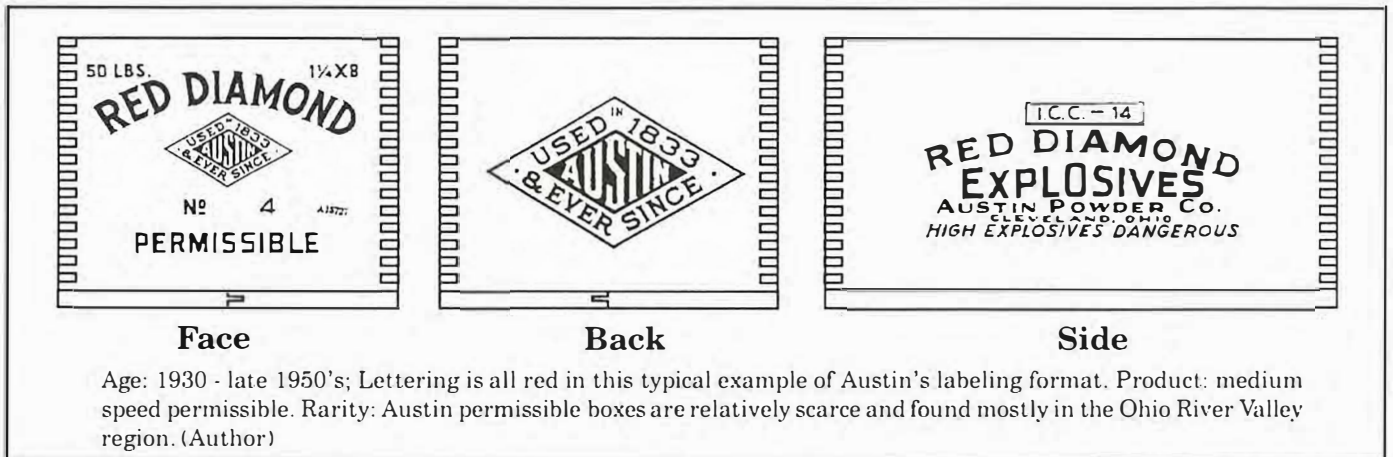
by Eric Twitty

In 1832 Alvin, Lorenzo, Henry, Daniel, and Linus Austin struck out west from their home in Wilmington, Vermont in search of freedom, individuality, and prosperity; or as encouraging hometown residents phrased it, in search of "something to their liking". The five brothers traveled as far west as Kansas City, Missouri where they were forced to work in local lead mines to renew their depleted funds. They did not find mining for lead much to their liking and so they turned around and headed east until they reached Aakron, Ohio where they stopped to rest.

The Austins liked the Aakron area and acknowledged its business opportunities, amongst which a notable demand for gunpowder. With their funds, the five brothers established a small water-powered gunpowder mill at Old Forge and crewed it themselves. Later known as the Newburg Mill, this site was specifically chosen by the brothers because it had fine water power and it had access to the local

transportation network of roads and canals. From Aaron, the Austin Powder Company gained access to number of markets which included coal, iron, and clay mining, quarries, municipal construction, railroad construction, and canal projects.

Business for the Austin was good and in 1865 they expanded by leasing a mill built by the Cleveland Powder Company at the Five Mile Lock on the Ohio Canal. At the end of the lease in 1869 the Austin Powder Co. purchased the mill, known by this time as the Brookview Mill, and operated it profitably until 1907 when the expansion of the city of Cleveland forced its closure. The expansion of Cleveland city limits was forecast as early as 1891, and in preparation for the Brookview Mill, a new mill was built by 1892 near Glenwood, Ohio. For a while both mills operated simultaneously. Around 1900, the Glenwood Mill was dedicated to the manufacture of gunpowder, while the Newburg Mill was dedicated to producing blasting powder.



Face
50 LBS. 1 1/2 X 8
RED DIAMOND
USED IN 1833
& EVER SINCE
EXTRA GELATIN
40% STRENGTH

Back
USED IN 1833
AUSTIN
& EVER SINCE

Side
I.C.C. - 14
RED DIAMOND
EXPLOSIVES
AUSTIN POWDER CO.
CINCINNATI, OHIO
HIGH EXPLOSIVES DANGEROUS

Age: 1930 - late 1950's: Labeling is usually all in red, however, a few rare cases of boxes with black side labels have been documented. Rarity: scarce and found in the East, Midwest, and occasionally the Rocky Mountains. (Bill Lorah)

Top

Bottom

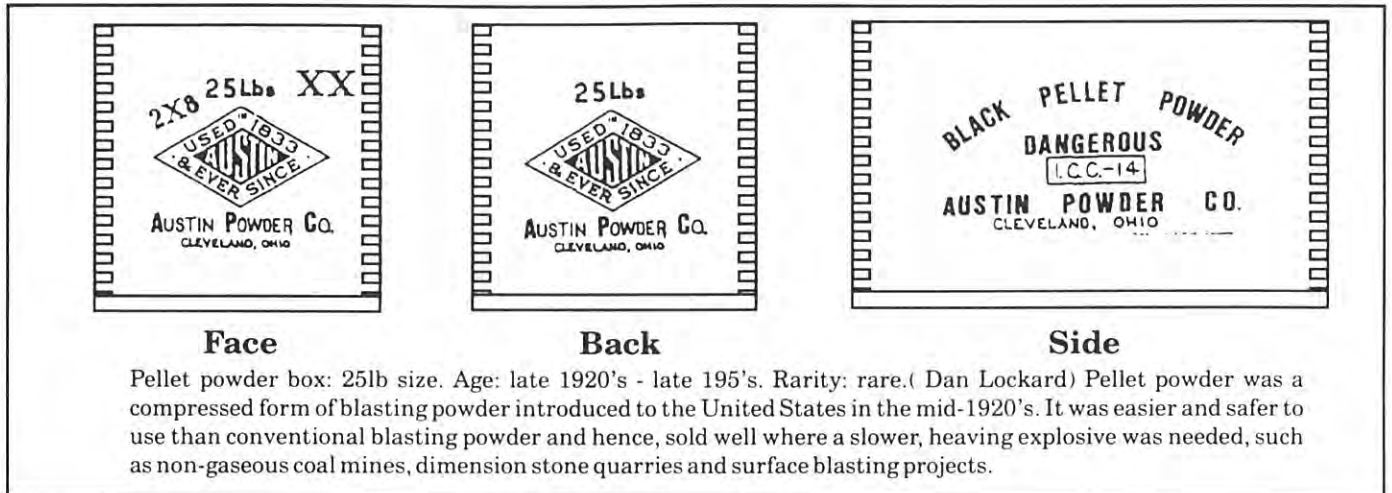
Powder Kegs

Age: 1840's - 1880's; Wood & paper label. Rarity: this keg is only a facsimily - none are known to exist; paper label courtesy of Hagley Museum & Labrary. "FF", the powder's grain size, was most popular for hardrock mining.

Despite the upsurge in demand for high explosives in the 1880's and 1890's, the Austin Powder Co. limited itself to the blasting powder for decades. It was not until approximately 1910 that Austin involved itself in high explosives by selling Gold Medal Dynamite, manufactured by the Illinois Powder Mfg. Co., through its sales agencies. It sold like hot cakes which was duly noted by Austin's upper management. The success of Gold medal coupled with many direct requests for an Austin-brand dynamite received in the home offices caused Austin managers to give serious consideration to

manufacturing dynamite. But this did not give way to action until the boom period of the late 1920's, during which Austin officials sought a plant site and planned manufacturing and marketing strategies. Despite the nation's plunge into depression in 1929, enough demand remained in the areas served by Austin that it proceeded with its plans to make high explosives. In the same year Austin obtained a fine site strategically located on the Baltimore & Ohio Railroad in MacAther, Ohio and construction began at once. By 1930 a modern dynamite plant was built with a manufacturing capacity of eight

Age: 1913 - 1920's: Iron with "Austin" - style bung; Labeling is embossed and its format my date back to the 19th Century. Rarity: one known. (Kurt Kremer)

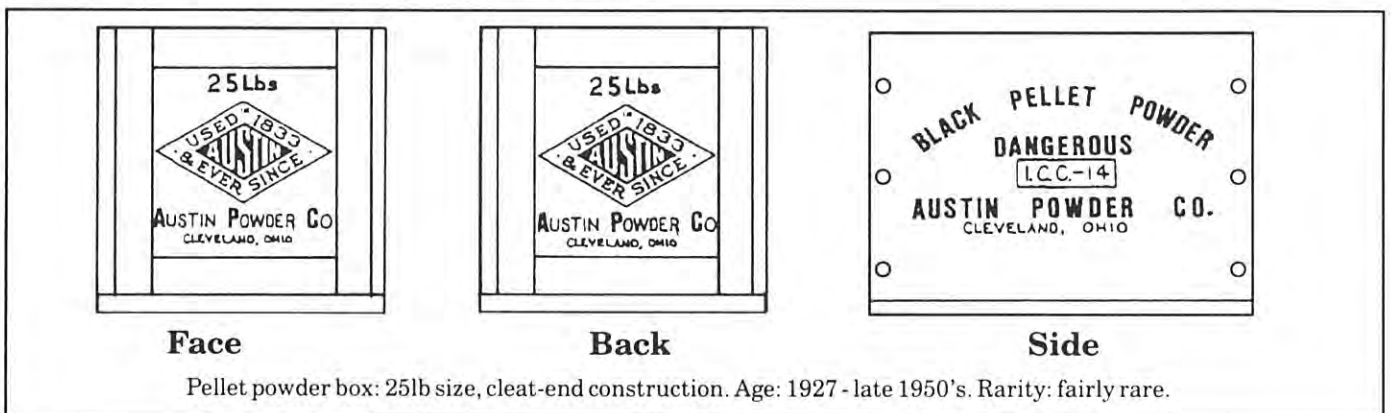


tons per day. Products manufactured were straight dynamite, gelatin , semi-gel, ammonium nitrate, extra formulas, and permissible dynamites. All products were sold under Austin's "Red Diamond" logo.

Most of Austin's high explosive customers were quarries, metal mines, salt mines, and coal mines in the South, the Midwest and Pennsylvania. Some of Austin's products made their way as far east as Massachusetts and as far west as Colorado and Montana.

With income provided by the explosives boom caused by World War Two, and in response to heavy mining in the South and Midwest, Austin began an expansion program during which it opened five new high explosives plants. These included

Ocala, Florida; Madisonville, Kentucky; Boonville, Indiana; Carrier Mills, Illinois which opened in 1955; and La Follette, Tennessee which opened in 1958. The main offices remained in Cleveland , Ohio and in 1955 a new center was opened in Madison, Kentucky to serve the southern states. By 1950 the Austin Powder Co. was one of only a few explosive manufacturers still making blasting powder, the others being the Atlas Powder Co., E.I. DuPont de Nemours & Co. , the Hercules Powder Co., and the King Powder Co. The Austin Powder Co., one of the oldest explosives companies in continuous operation in North America, remained highly competitive, progressive and successful well beyond 1960.



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- Bill Cashin
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- VanGelder, Arthur and Schlatter, Hugo
"History of the Explosives Industry in America"
Columbia University Press, 1927

JOHN C. GREENWAY, THE AJO EXPERIENCE

by H. Mason Coggin
Continued from Issue 1

Again writing to George A. Newett, Greenway describes the progress of the railroad.³³

The Ajo work is developing finely. Rate agreements with the Southern Pacific and El Paso & Southwestern Companies have been signed up. Permanent location of the railroad has been made and the work is now open for examination by contractors and we expect to award the contract about the middle of June. The road will cost approximately \$700,000.00 to complete. There is no gradient in the line from Gila out 36 miles that is over 1/2 of 1% and no curves of 3 degrees. From this point back to Gila there are no adverse grades, all grades being either level or minus. From the 35 mile post into Ajo, there is a gradient of approximately 1.25 percent. Rail heads should reach Ajo, if our plans carry, sometime in January.

I also hope to be able to have material for construction of the plant ready for delivery into Ajo when the road is ready for transportation in order that there should be no break between the completion of the road and starting of construction work.

We have not been able to develop the results in the 40-ton plant that we have gotten in the 1-ton plant, but the work is improving right along and Ricketts and I consider the process is in satisfactory shape.

Including the town, the railroad and the extensive water development plant, the overall cost of the development was estimated at \$7 million. Opposition to this large sum among the directors of the NCCC continued. They felt that it was too much to spend on a property that still seemed unproven. Some of the directors felt the townsite was an unnecessary luxury. Their reluctance forced Greenway to secure every dollar under

criticism. Earlier opinions that the Ajo ores could not be profitably handled were brought up and rehashed at the Board meetings.³⁴ Newett, in a letter to Greenway,³⁵ says, "I was very glad C&A directors decided on \$1.25 (dividend) as it is saving a lot of criticism. Most holders of the stock do not realize just what is being done for them at New Cornelia and other places."



AJO STATION c. 1917. Rail transportation was the best way to transport materials and supplies when the Tucson, Cornelia, and Gila Bend Railroad established this essential link between Ajo and the Southern Pacific Railroad at Gila Bend. Photo from George A. Newett.

Although beset with these difficulties, Greenway allowed no pause in his planning. If the project had not been struck by the Industrial Workers of World (IWW) near the end of construction, it would have been finished in April, three months ahead of schedule. As it was, they were delayed until May 1 leaving two full months before the promised July 1917 target date.³⁶ During this period, Greenway was traveling around the country inspecting and purchasing equipment for the project.³⁷

One of the financing techniques used by the C&A to fund this operation was the issue of \$4 million of sinking fund gold bonds at 6% convertible for \$10.00 per share. The C&A bought \$3.1 million of these bonds as soon as they were issued.³⁸ The remaining bonds were immediately picked up by the Directors and Officers of the C&A and the NCCC. The El Paso and Southwestern, who provided at least some of the funding and a great deal of expertise helped out with the costs and construction of the railroad.



EARLY AJO HOUSING, c. 1917. The tent house on the left was typical of about 50% of the housing in Arizona at the turn of the century. One of the NCCC's first activities was to provide adequate housing for all of its employees. In spite of the best efforts of the company some of these tent houses remained in Ajo until the late 1940's. M. Curley School in the background. Photo from George A. Newett.

During the middle of construction, and again at the end, the C&A Board of Directors toured Ajo to view the progress. Several photographs taken by George A. Newett, a director of the company, are attached.

Three Osgood steam shovels and 36 twenty-cubic-yard side dump railroad cars were delivered to Ajo as soon as the rail was completed. The equipment for crushing, leaching, and acid storage, the electrolytic tank house, power plant and other facilities were soon delivered to the camp.³⁹ With the new equipment on hand the plant was quickly completed.



VAT LEACHING, c. 1917. These are the vat leaching tanks that the NCCC constructed to hold the broken oxide ores while they were being leached. Photo from George A. Newett.

From the May 1, 1917 start-up until the end of the year, net profit from the operation reached \$760,000. The first 53,000 tons of ore averaged 1.58% copper. Reserves at year end stood at 30

million tons of oxide carrying 1.83% copper. Thirty-nine million tons of sulfides grading 1.75% copper had also been developed. The company began testing a flotation process for these ores the following year.

Just as the plant was starting, the U.S. declared war on Germany. Fiercely patriotic, Greenway joined the military, where his record during the next year was exemplary. He went into the Army as a major in the Corps of Engineers.

A large gathering of his friends organized a departure party in Bisbee before Greenway left for Europe. At that all-day community celebration, he described the vital need for copper in the war efforts of the United States and its allies.⁴⁰ During his service he was honored and decorated several times for heroic episodes by both the US and French governments. After the Treaty of Versailles he left France a brevetted General.

The Armistice created a copper glut and during the next year a large surplus of copper was stockpiled by producers. In the face of this surplus, Greenway was still able to convince the NCCC to install a second pump and start a 500-ton-per-day flotation pilot plant to test the sulfide ores.⁴¹



AJO HOUSES, c. 1920 This image of the Ajo housing was made by George A. Newett during a New Cornelia Copper Company Board of Directors meeting at the mine some time in the early 1920's. Apparently these are duplex houses in what was called Mexican town. Photo from George A. Newett.

The flotation process at that time had become the most accepted form of copper sulfide concentration from low-grade sulfide ores. It was developed after a woman who washed miners' clothes noticed that the soap bubbles would attract and hold the copper sulfide minerals. In this process the ore is crushed and ground to the con-

sistency of corn meal, mixed with water, oil and soap, and then subjected to a bubbling action. The sulfide minerals attach themselves to the bubbles and are brought to the top of the solution where they are skimmed off and the minerals collected. Thickened and filtered, this sulfide pulp is sent to the smelter where the sulfur is burned off and other impurities removed by fluxing. The resulting copper matt is first reduced to an oxide by introducing oxygen, and then the oxygen is removed by poling the mixture with green logs.



START OF MINING c. 1917. As soon as the railroad started bringing in the equipment the mining operation started. Photo from George A. Newett.

In spite of the recession and depressed copper market, the NCCC continued to build and improve the townsite and the community of Ajo. In 1918, the company built sixteen new houses for employees, installed a ten-ton-per-day ice plant and operated the New Cornelia Mercantile Company on a competitive basis. The community, like most southwestern towns, was segregated with Mexicans living in Mexican Town, Indians living in Indian Town and Whites living in Ajo. The squalid conditions of Mexican Town were so bad that the company made this the first segment of the population to receive new housing. Most of these homes were of the duplex type and housed two families. The anglo community in Ajo was the last to be rebuilt. Ajo families still lived in tent houses through World War Two.

The NCCC encouraged alternative stores to the co-operative and even provided them with incentives to enter the community. These incentives included reasonable rental rates and cheap utilities. The biggest advantage of the co-operative was a 15% profit refund made to employee customers in time for Christmas shopping.⁴² Studies by the company showed that

76% of the employees shopped at the cooperative, and, although prices were slightly higher, the quality was above standard.



AGUA CALIENTE SPRINGS OF ARIZONA, c. 1920. This is the stop on the Southern Pacific Railroad where the passengers to Ajo left the railroad to travel by motor car or wagon to Ajo. This photograph taken in the early 1920's shows the motorcars being readied for the two day trip. Photo from George A. Newett.

Early in the development of the town the company planned a plaza surrounded by trees, a gazebo and grass. A virtual oasis in the desert, it provided a well shaded area for picnics and parties. Stores, a theater, the TC&GB terminal and churches lined the plaza. To make life more enjoyable, the company built a large swimming pool for **ALL** of its employees as soon as the mine was on a stable and paying platform. During the summer of 1921 this pool served 11,647 customers and 48 people learned to swim.⁴³ The paved streets of Ajo radiated from the plaza. In the first blocks they planned a Christian church and a Catholic mission. Partially completed in 1921, these served a community of 747 employees, including 442 of European or American extraction, 297 Mexican or Indians and eight blacks. Ajo was on par socially with other Southwestern American towns and mining camps.⁴⁴

Ajo was first and alone in developing a leaching operation for its oxide copper ores, and first to resolve the electrowinning problems in recovering a directly marketable product. Economically, this mine made a substantial impact on Pima County. In 1919 it paid about 40% of the Pima County taxes, or about \$1.85 per man-shift. The average wage paid to workers at the mine was about \$5.90 per day.⁴⁵

Greenway began pushing the company to

build a sulfide mill in 1920 to accommodate the increasing sulfide ores. He received approval in 1922 and began to design a mill with a flotation capacity of 5000 tons per day. The new mill would require additional water, and the company immediately started its second water shaft, with a planned depth of 656 feet. Drifts into the aquifer would be driven horizontally from the bottom of the shaft to provide additional water flow to the pumping plant. The water requirement for the new mill was anticipated at 4,000 gallons per minute. Although this volume would not be considered large by Salt River Valley farmers' standards, it was a large volume to extract from the gravels that the NCCC had located several years earlier.



HOTEL CORNELIA. Was deserted and windows boarded over when the author took this picture in January of 1994.

Additional locomotives, dump cars and steam shovel equipment would be required to move the planned 5,000 tons of ore per day to the new sulfide mill. The deepening mine needed more track to reach the ore faces and more time per trip to spiral the ore from the mine to the mill on the 4% grades that still restrict rail traffic.

At year-end 1922, the NCCC was back to being a healthy cash-winning subsidiary of the C&A from the continued production of copper from oxide operation.⁴⁶

As the sulfide concentrator neared completion in 1923, the attention to planning for corporate success continued, as only three years of leach reserves remained and a smooth transition would be required to keep this subsidiary solidly in the black.

Two new shovels, three locomotives and 20 railroad cars prepared for assault on the sulfide ores. As a part of the scheme to switch over to sulfide ores, the mine planned to start roasting their own ores for the sulfur gas that it used to reduce the iron in its now famous process.



THE PLAZA, c. 1923. Complete with Flag pole, it was the only grassy plot of ground in the 300 miles between Tucson and Yuma. Photo from George A. Newett.

After a slow start the Ajo flotation mill operated at 50% capacity during 1924, when it treated 1.8 million tons of sulfide ore and leached 1.2 million tons of oxides. The expansion was completed and Ajo increased production to nearly 64 million pounds of copper.⁴⁷

With this increase in copper production, NCCC got a substantial boost in earnings and income. On assets of \$33 million and through sales of nearly \$9 million, the company was able to hold an operation profit of just under \$3 million dollars. They paid out \$675,000 in dividends and produced nearly 64 million pounds of copper. As a bonus, the flotation of the sulfide minerals also recovered 106,000 ounces of silver and 10,675 ounces of gold. This precious metal aspect at Ajo remained an important contributor to Ajo's production throughout its operation lifetime.

The NCCC continued to improve the condition in the townsite. Through generous donations which were matched by contributions from the community, the Ajo Federated Church was completed early in 1926. The Catholic Mission had already been dedicated on Thanksgiving Day, 1925, in an all-day ceremony of prayer and thanksgiving.⁴⁸

The NCCC organized, funded and then transferred title to their utility to the Ajo Improvement Co. in 1925 to provide lights and water to the community.

Continued exploration and blocking out of new reserves was successful, and at the end of

1925 reserves stood at 54 million tons, with an average grade of 1.41% copper as sulfides. The oxides dwindled to just slightly over 3 million tons averaging 1.25% copper.



GREENWAY HOME IN AJO. When this picture was taken the new owners of the home were planning on turning it into a bed and breakfast for tourists. Photo by author 1994.

John C. Greenway resigned as General Manager of the Calumet and Arizona Mining Company on June 20, 1925. For years a rift had been developing between Greenway, the president of the C&A, and several of the directors over a commitment that Greenway made regarding a small mine in New Mexico. The C&A acquired the 85 Mine, located about five miles south of Lordsburg, New Mexico, to provide flux for the Douglas smelter. Greenway made a verbal commitment during the negotiation to provide the former owner with 9,000 tons of ore from the mine. After reviewing the contract, the C&A attorney observed that the contract was not binding and they did not need to honor Greenway's commitment. Greenway claimed that it was a moral obligation and that the company should deliver the 9,000 tons to Doer and his Kansas City Smelting and Refining Company. After several letters and telegrams, Greenway submitted his resignation.⁴⁹ The other officers and directors apparently convinced Greenway to stay on board, but the rift had already started and Greenway had his own programs, including politics, dam building and developing new mines. His untimely demise ended these plans.

Perhaps the real reason for Greenway's resignation can be found in a letter from Gordon R. Campbell's to Harry A. Clark of May 23, 1925, wherein he says:

*My dear Harry:
When I arrived at Arizona early in
April, Mr. Greenway handed me a let-*

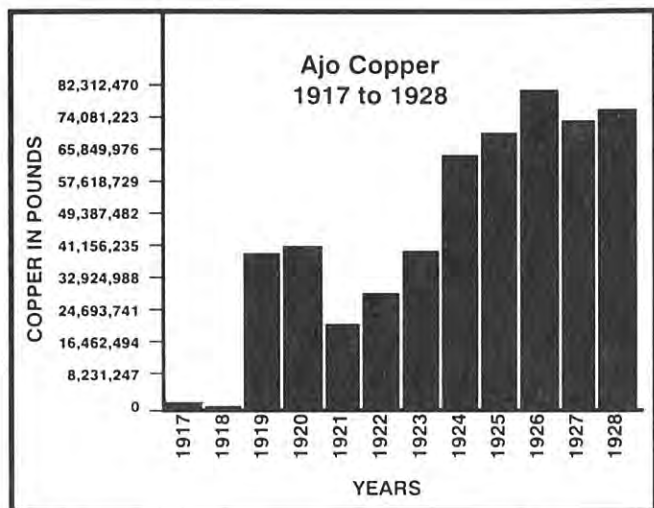
ter which, much to my surprise, proved to be a tender of his resignation as general manager of Calumet & Arizona Mining Company and of New Cornelia Copper Company. He asked that it be presented to the directors immediately and this was done at our meeting at Ajo. It was considered advisable to defer action for the reasons that several directors were not present and that we might have opportunity to consider and formulate our policy as the result of his resignation.

After very careful consideration and after canvassing the whole situation, it was the opinion of every member of the board of directors and it was therefore unanimously agreed that the resignation of the general manager should be accepted, effective June 30 next, and that no general manager should be appointed to succeed him for the present.

By the same unanimous judgment it was agreed that you should be made "manager"? Of Calumet & Arizona Mining Company proper; that E.E. Whiteley should be made "assistant manager;" and that M. Curley should be named as manager of New Cornelia Copper Company.⁵⁰

Interpretation of this letter at this late date is difficult. In the preceding years Greenway had been elected to the Board of Directors for the corporation but was not made its president. There have been other recent changes in the corporate structure, and perhaps he was disappointed in not being promoted. At any rate they did not replace him as General Manager but created other positions that were more subordinate to the President and the Board.

Greenway alone was responsible for the C&A's involvement in Ajo. He had pushed a reluctant corporation into acquiring the property and he had succeeded where other noted mine operators had failed. He made the mine a technical and financial success in the face of their stated doubts. It was his imagination, his leadership and most of all his perseverance that made Ajo successful. This success can be seen by graphing Ajo's copper production from 1917 to 1928:



In spite of Greenway's early demise, Ajo would continue to produce great quantities of copper for the New Cornelia Copper Company and the Calumet and Arizona until that company's merger with Phelps Dodge during the great depression of the 1930's. Operations would be suspended for a few short years in the mid-30's only to be restarted, rebuilt and revamped to one of the primary sources of revenue for Phelps Dodge and one of the all time great copper producers for the United States.

EXHUMATION AND REINTERMENT

As a post script, Jack Greenway, who was born two years before the general's death, was raised by his mother at the Arizona Inn in Tucson. He was never involved in the mining industry, and his ties to his family reach back to his mother's ancestral home in Virginia. Jack has provisions in his will to be buried with his mother in the family vault in Virginia. He has also provided that his father be removed from his Ajo vault to join them there. When that happens Arizona will lose the last sad remains of one of its most important pioneer developers.

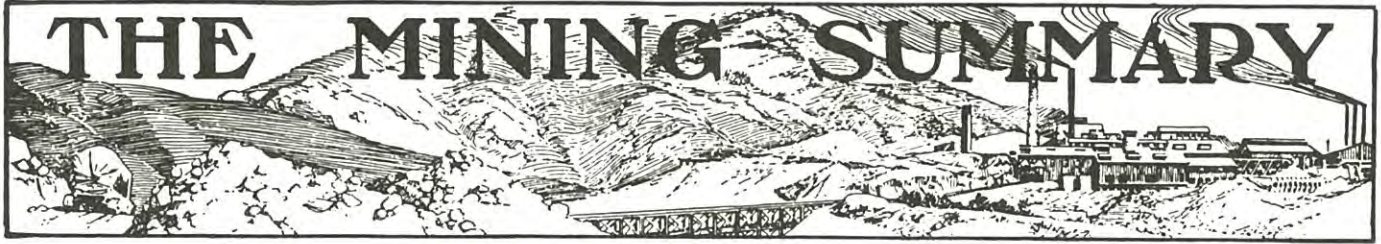
It is doubtful that any monument to General Greenway could be built over his grave in Kentucky that would be as meaningful, dramatic or as appropriate as his Ajo Open-Pit copper mine. Perhaps some future generation will recognize his contribution to the development of Arizona and build a great monument to John C. Greenway at the open-pit overlook.⁵¹

33. Greenway, John C., *Letter to George A. Newett*, June 2, 1915, letter in possession of author.
34. Watkins, Robert A., John C. Greenway, *Arizona Mining Journal*, Oct. 1917, pgs. 1-3.
35. Newett, George A., *Letter to John C. Greenway*, Dec. 13, 1915, in author's possession.
36. Watkins, Robert A., John C. Greenway, *Arizona Mining Journal*, Oct. 1917, pgs. 1-3.
37. Greenway, John C., *Letter to George A. Newett*, March 25, 1916, in author's possession.
38. *C & A Annual Report to Stockholders 1916*
39. *C & A Annual Report to Stockholders 1916*
40. Wathins, Robert A., John C. Greenway, *Arizona Mining Journal*, Oct. 1917, pgs. 1-3
41. *New Cornelia, Annual Report to Stockholders 1918.*
42. *New Cornelia, Annual Report to Stockholders 1918.*
43. *New Cornelia, Annual Report to Stockholders 1921.*
44. *New Cornelia, Annual Report to Stockholders 1924.*
45. *New Cornelia, Annual Report to Stockholders 1920.*
46. *New Cornelia, Annual Report to Stockholders 1922.*
47. *New Cornelia, Annual Report to Stockholders 1924.*
48. *New Cornelia, Annual Report to Stockholders 1925.*
49. John C. Greenway, *letter to Mr. Kuno Doerr*, July 12, 1920. The Greenway Collection Arizona Historical Society, Tucson, Arizona, 85 Mine folder.
Mr. Charles Briggs, *letter to John C. Greenway*, July 12, 1920, The Greenway Collection Arizona Historical Society, Tucson, Arizona, 85 Mine folder.
John C. Greenway, *letter to Mr. Charles Briggs*, August 7, 1920. The Greenway Collection Arizona Historical Society, Tucson, Arizona, 85 Mine folder.
John C. Greenway, *letter to Mr. Charles Briggs*, August 13, 1920, The Greenway Collection Arizona Historical Society, Tucson, Arizona, 85 Mine folder.
50. Gordon R. Campbell, president of the C & A, *letter to Mr. Harry Clark*, about to be manager of the C&A, May 23, 1925, copy of letter in author's possession.
51. John Campbell Greenway has left Ajo for the last time. *Ajo Copper News*, Ajo, AZ, Nov. 8, 1995. ✕



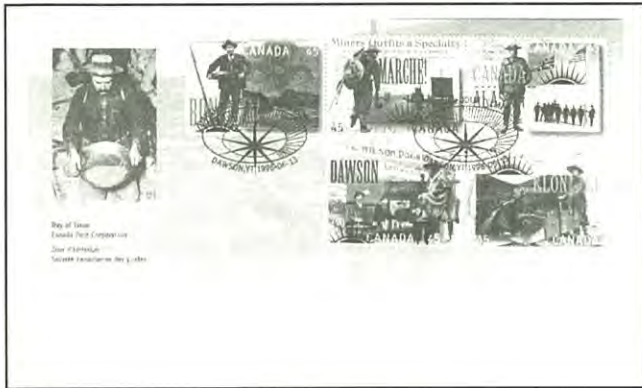
Artwork from the Manhattan Cowboy Mining Company Stock Certificate, Circa 1906.

THE MINING SUMMARY



WHAT'S NEW IN COLLECTING

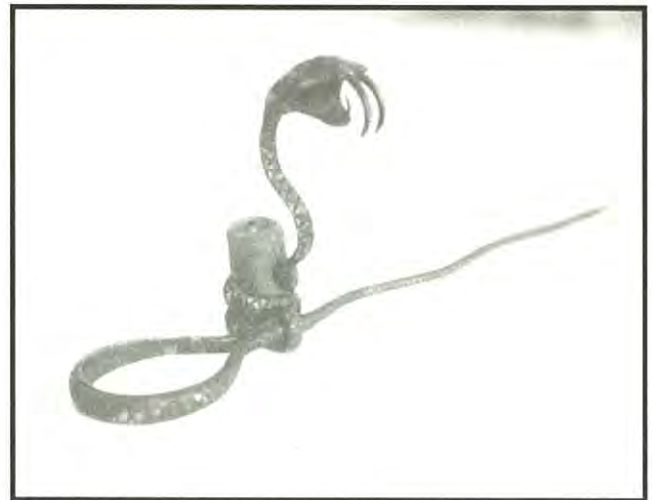
First Day Cover - Dawson, YT



This is a first day cover from Dawson, Yukon Territory, June 13, 1996, commemorating the Klondike gold rush. These stamps illustrate the various aspects of life among those who took part in the last great rush. They are very attractive with vivid color and a sun's corona in each one. Look for more items such as this throughout the year as the celebrations come to a climax this summer. (Courtesy Udo Matern - actual size 4.375" x 7.5")

A Candlestick with Teeth

I'm not sure if this candlestick would qualify as fancy-maybe just interesting. This stick was submitted by Deric English, it is 9 inches long and 4 inches high and bears a likeness to old Mr. Noshoulders who doesn't need one of these when he goes underground.



ETNA CAP TIN

Another cap tin has been discovered that appears not to have been previously described. Not to be confused with the Aetna cap tin, this cap tin top was found on the surface in an old mining district in Nevada. According to an article by Mark Bohannon in the spring 1990 edition of the "Mining Artifact Collector" Etna caps were manufactured by the Tonite Powder Company of California. The company was active between 1880 and 1885 which would be consistent with the age of the workings where the tin was found (Illustration by Andy Martin - actual diameter 2 inches).



The Tonite Powder Company had the first plant to commercially produce nitrocellulose for use as an explosive. Unfortunately the safety of this compound is dependent on great care taken during the purification process. The stability of this explosive was always in question and competitors were quick to advertise this fact. Dry nitrocellulose is actually very sensitive to impact, friction, heat and spark and is almost comparable to mercury fulminate in sensitivity. It is interesting to note the recommendation in the following ad to use the explosive as a torch while underground; hopefully a transition from conflagration to detonation didn't occur.

TONITE.

THE PATENT SMOKELESS BLASTING MIXTURE.

This powder has been in use in England for five years, and its consumption has steadily increased; the sales last year being quite 25 per cent more than in 1879. It has given the greatest satisfaction, and wherever it has received a trial, it is preferred to any of the other high explosives on the market, on account of its remarkable merits which will be even more highly appreciated on this coast, owing to the extremes of heat and cold in our mining districts.

IT DOES NOT FREEZE.

IT DOES NOT DETERIORATE WHEN KEPT IN HOT PLACES.

IT DOES NOT YIELD NOXIOUS FUMES.

IT CAN EVEN BE BURNED LIKE A TORCH IN DRIFTS, TUNNELS, ETC., WITHOUT CAUSING the miners working there any inconvenience; on the contrary, it furnishes a light of great beauty and intensity.

TONITE CONTAINS NO NITRO-GLYCERINE. CHLORATE OF POTASH, SULPHUR, PICRIC ACID, nor any other substance which explodes by friction, hence it can be considered the safest blasting powder in use, yet when properly detonated it has no superior in strength.

WHILE IT CAN BE CONFIDENTLY RECOMMENDED FOR ITS SAFETY IN TRANSIT, STORAGE and ordinary handling, no accident having occurred with it, the fact that it is a very powerful explosive, should not be overlooked.

Tonite is allowed to be transported over the Railroads of Great Britain, a privilege not extended to any other strong explosive, and which was granted only after subjecting it, under Government supervision, to the severest possible tests as to its safety.

The Company, in addition to Tonite, also manufactures, as a specialty, TONITE DETONATORS and ETNA CAPS, which are superior to any exploders in the market for firing nitro-glycerine or any other explosive where powerful detonation is desirable or necessary.

The Company also manufactures the PATENT SOCKET DISTRESS AND ALARM SIGNALS, for ship or shore use, which have come into such general use in Europe and upon the Atlantic, that almost all steamers plying between Great Britain and the United States are now supplied with them. They are now considered as indispensable for Fog-signals. Tonite is the only explosive which can be used in these signals. The Company also makes Torpedoes and Rockets without sticks.

The Company also sells a Combined Fuse-Cutter and Cap-Nipper or Fastener, a new and very useful little instrument.

Tonite is destined to supersede Nitro-Glycerine Powders and surely as these have superseded common gunpowder, as the miners of this Coast will be quick in appreciating the value of an explosive, which while as strong and Giant Powder, or any other explosive in use, gives off no noxious fumes, does not freeze, does not lose its strength with age, and is safer to handle in all ways.

In offering this "explosive of the future," as it has been called by prominent scientific men in Europe, we simply ask consumers to give it a trial.

Please address all communications to

TONITE POWDER CO.,

HAMILTON SMITH, JR., President.

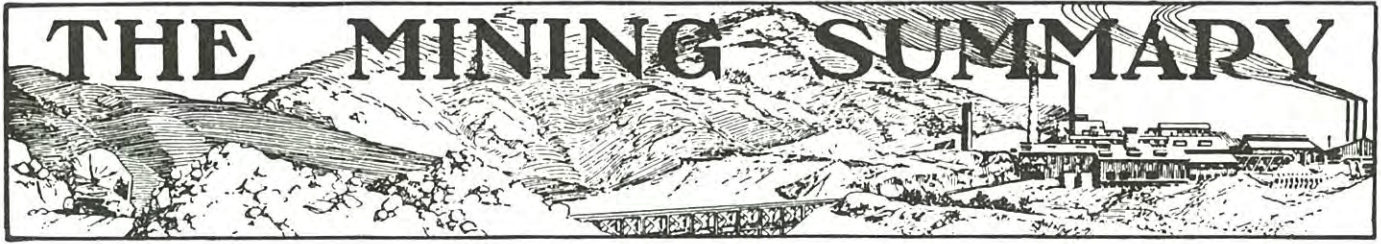
WM. LETTS OLIVER, General Manager.

RALPH L. SHAINWALD, Secretary.

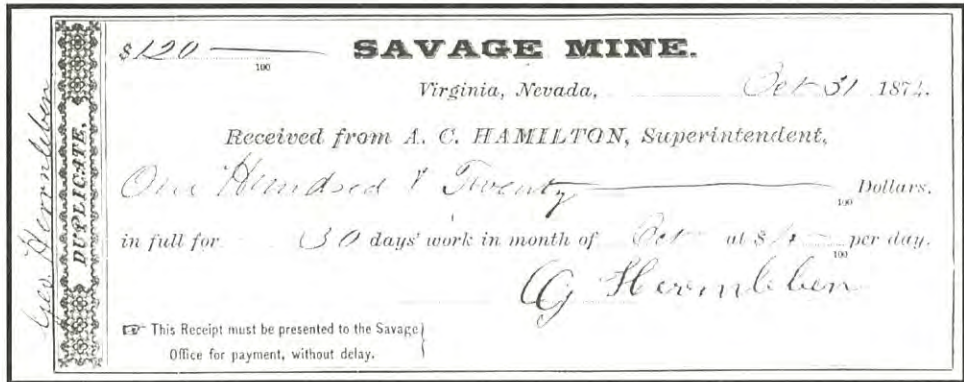
218 California Street

San Francisco,

California.



WHAT'S NEW IN COLLECTING



Savage Mine Receipt

Tom Johnson of Elko, Nevada, recently obtained this pay receipt from the Savage mine. The Savage was one of the large mines in Virginia City, Nevada and the date of 1874 marks this as during the glory days of the district.

Mr. George Herrleben, the miner, was paid \$4.00 per day for 30 days for a total of \$120 . Not bad considering today he would have taken home less than a hundred after deductions for social security, worker's comp. Medicare etc.



Pass the Bourbon

This bottle dating from the 1880's was found in Mineral County, Nevada. As the label states, this Old Bourbon is J.R. Millard's finest and was waranted to be free from all poisonous drugs. Although not directly related to mining, I'm sure it was a valuable adjunct, as a necessary obtundent against the hardships of mining in this area. It was found in a small adit and was covered with candle wax drippings ,

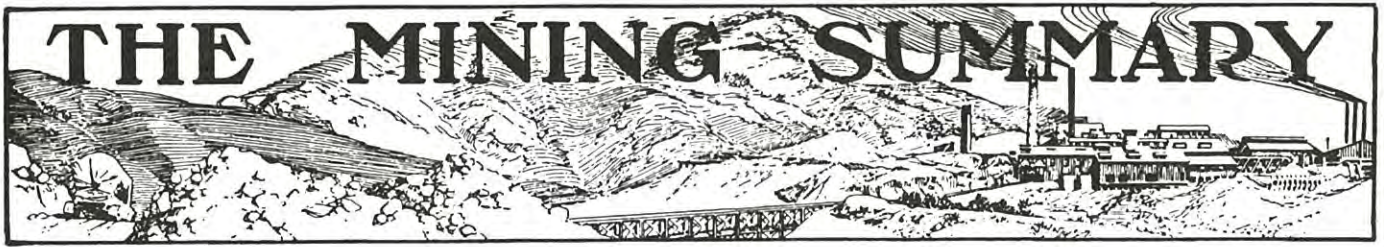
demonstrating its double duty as a candle holder after its medicinal effects were spent. The monkey on the label was a testament to its ability to transform the drinker into a similar creature. On the other side of the bottle the glass is stamped with the trademark of Lindley and Co., a well known spirits distributor from Sacramento.



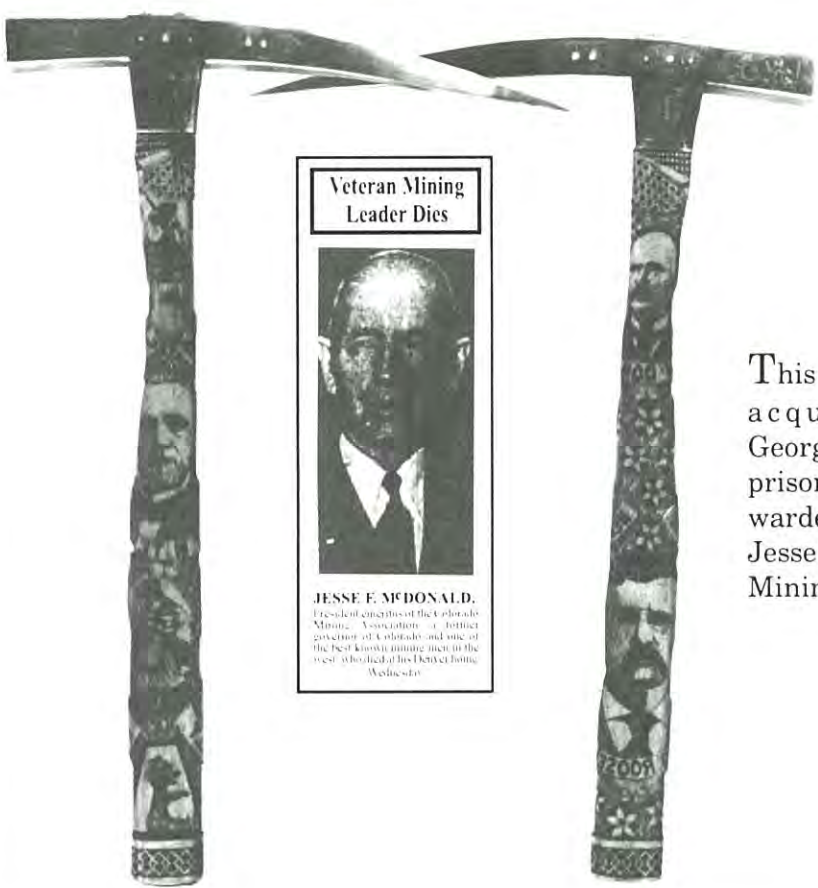
Leader Carbide Container

This is a cardboard box for Leader Carbide containers recently displayed by Errol Christman. These handsome containers had a removable cover that held matches, flint, and small repair parts.


THE MINING SUMMARY



WHAT'S NEW IN COLLECTING



Veteran Mining Leader Dies

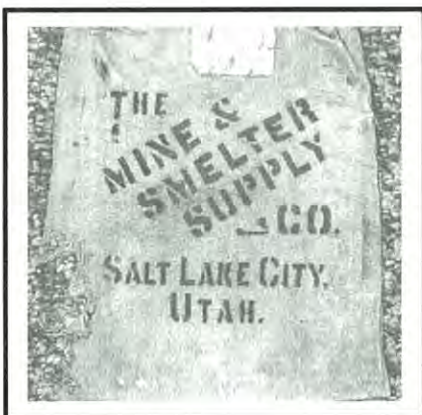


JESSE F. McDONALD.
 President emeritus of the Colorado Mining Association, a former governor of Colorado and one of the best known mining men in the west. He lived in the Denver home. (Western)

Presentation Pick

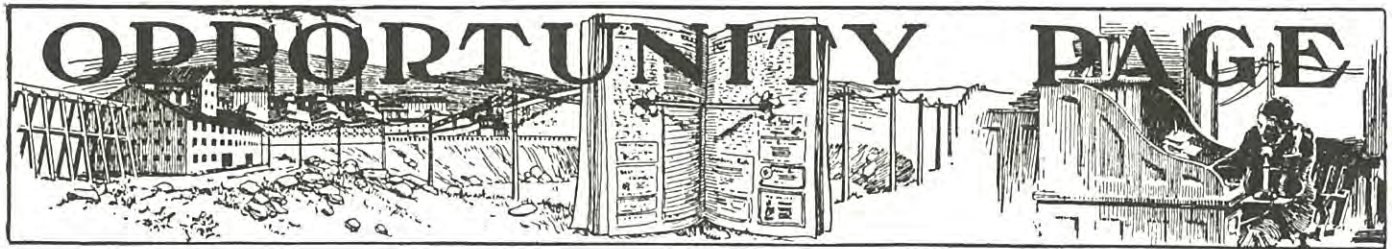
This presentation pick was recently acquired by Leo Stambaugh, Georgetown, CO. It was made by the prison shop at Canon City, CO. for warden John Cleghorn to award Gov. Jesse McDonald, founder of the Colorado Mining Association.

Canvas Bag



This canvas bag was recently found at the Egeville mining district, Mineral County, Nevada. It contained litharge (a lead compound) for use in gold and silver fire assaying. The litharge was made by the American Smelting and Refining Company (ASARCO) and was distributed by the Mine and Smelter Supply Company in Salt Lake City, Utah. It is 1910-1920 vintage.





ADVERTISING

RATES: 1/4 page ad (business card) \$25, 1/2 page \$50, full page \$100 per issue or 1/4 page \$90, 1/2 page \$180, full page \$350 for 4 issues.

CONDITIONS: Ads must be submitted each issue in which they will appear unless a 4 issue arrangement has been made. They should be received camera ready 2 weeks before the next publication date. Ads will be accepted on a first come first served basis and the editors reserve the right to refuse any ad. We discourage the use of monetary value in ads and recommend that buyer and seller contact each other personally for prices. No advertiser will be contacted prior to the publication mailing date.

GLOBAL MINERAL RESOURCES



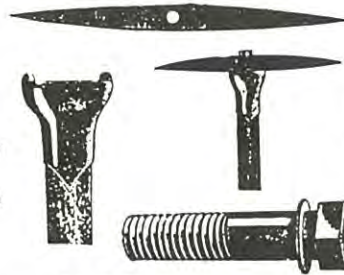
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Reno, Nevada 89509
U.S.A.

Tel. (702) 322-8535
Fax (702) 825-5396

Martin C. Jensen, M.Sc.

R. Scott Werschky, M.Sc.

Black Diamond Patent Picks



Always please where introduced. Would you like to sell something that every one else was not trying to cut prices on regardless of profit? Something that would make you friends?

— TRY THESE.

HARDSOGG Mfg. Co., OTTUMWA, IA.
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MINER'S SUNSHINE

*Brightest and Cleanest
Light for Miner's Use*



Office of
State Inspector of
Mines

Indianapolis, Aug. 2, 1905.
Standard Oil Company—

Dear Sir: Concerning Miner's Sunshine will say I have always advocated its use in our mines. My reason for this is that it produces a better light and comparatively no smoke at all. In making our rounds of inspection I find of late that considerably more of the Sunshine is used now than in former years and I would like very much to see the time when it takes the place of oil entirely in the mines. Have also instructed my assistants (who agree with me that the Sunshine is better than oil) to recommend its use.

Yours very truly,

JAMES EPPERSON, Inspector of Mines.

ABSOLUTELY NO WASTE **EVERY OUNCE IS BURNED**
Manufactured by STANDARD OIL COMPANY



612 6th Street
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(303) 569-2848
Leo Stambaugh

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TUCSON '97

3rd Annual Mining Antique Collectors Dinner, Auction & Swap Meet

during the
Annual Tucson Gem & Mineral Experience

When: Saturday, 8 February 1997
 Swap Meet 2:00 - 5:00 pm
 Dinner & Auction 6:00 pm

Where: El Parador Mexican Restaurant
 2744 E. Broadway, Tucson AZ

Cost: \$16.00 per person, by 1 Feb 97

For More Information Contact:

Jane Becksted
 (520) 792-0645

Don Dalton
 (520) 297-3001

Swap meet space is limited and reserved for persons with Dinner & Auction reservations only. Each space approximately 3ft X 4ft (or 1/2 table). Full Tables may be available if less than 30 people reserve space. Any available full tables will be assigned based on date of paid reservation. The additional \$5.00 will be collected during swap meet. NOTE: Swap meet tables must be cleaned off by 5:00 pm to allow for dinner set-up.



Registration Form

(early reservations appreciated!)

(Please print!)

Name(s): _____

Address: _____

Phone: () _____

Mail this form to:
 Jane Becksted
 2123 E 5th St.
 Tucson, AZ 85719

_____ # of Dinner Reservations @ \$16.00 _____

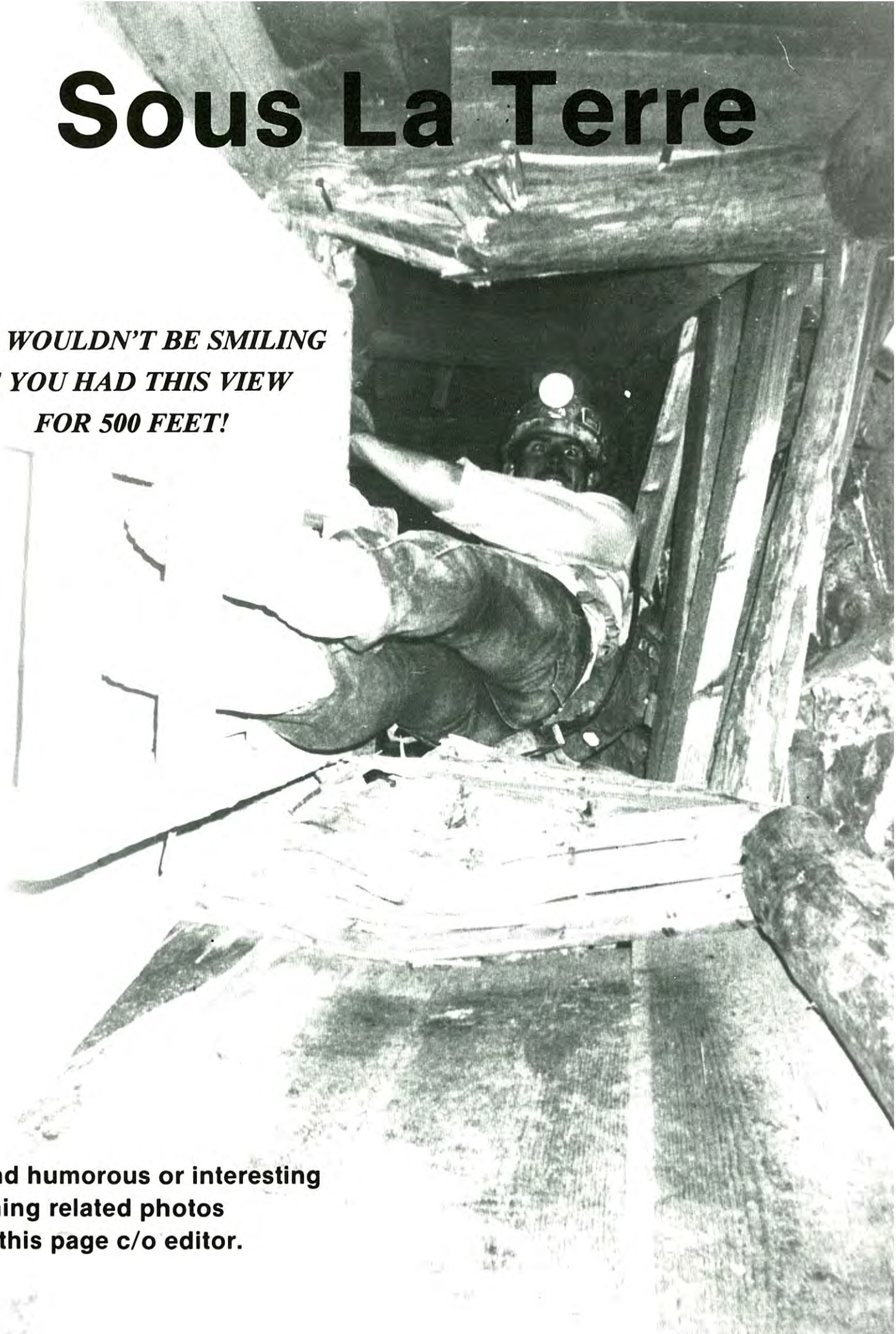
1/2 Table Space @ \$5.00 _____

Total Amount Enclosed \$ _____

Do you want a full table if available?
 Circle One Yes No

Sous La Terre

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IF YOU HAD THIS VIEW
FOR 500 FEET!*



**Send humorous or interesting
mining related photos
for this page c/o editor.**

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Keith and Brenda Williams

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or
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