

OREGON GEOLOGY

published by the

Oregon Department of Geology and Mineral Industries



VOLUME 44, NUMBER 12

DECEMBER 1982

- AWARDED TO -

CASCADE PUMICE CO.

FOR THE

**OUTSTANDING
MINED LAND RECLAMATION
PROJECT**

IN THE

State of Oregon

FOR THE YEAR OF

1982



**PLAQUE HONORING OUTSTANDING MINE
RECLAMATION PROJECT. See p. 139.**

OREGON GEOLOGY

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COVER PHOTO

Plaque awarded to Cascade Pumice Company, Bend, Oregon, winner of first annual award for outstanding surface mined land reclamation project in Oregon. Article beginning on next page discusses Oregon's surface mined land reclamation program and this award.

OIL AND GAS NEWS

Columbia County

The Libel 12-14 location listed last month for sec. 14, T. 6 N., R. 5 W. was drilled and abandoned as a dry hole. Reichhold Energy has now drilled and completed Paul 34-32 in sec. 32, T. 7 N., R. 5 W. This well is $\frac{3}{4}$ mi southwest of the producer Longview Fibre 12-33 and was completed on November 13. Total depth is 2,698 ft. This producer, the tenth in the Mist Gas Field, tested at 1.4 million cubic feet of gas per day and is the first well to have most of the mineral ownership privately held. Rights on previous wells have been held by Columbia County.

Clatsop County

Oregon Natural Gas Development Company will decide after January 1, 1983, whether to redrill Patton 32-9 in sec. 9, T. 7 N., R. 8 W. The well is now suspended.

Recent permits

Permit no.	Operator and well name	Location	Status
225	Reichhold Energy Corp.; Adams 13-34	SW $\frac{1}{4}$ sec. 34 T. 7 N., R. 5 W. Columbia County	Application.

Northwest oil and gas newsletters

Three companies in Oregon publish newsletters with current information about oil and gas developments in the Northwest. Their names, addresses, and types of information are listed below.

Oregon and Washington Oil and Gas Report (Published monthly by Delores Yates LANDATA Reporting and Services, Box 393, Portland, OR 97207, phone [503] 227-3670.) Covers Oregon and Washington. Includes current information on oil and gas drilling, lease applications and leases issued, simultaneous filing and competitive sales, changes in State and Federal regulations, drilling reports, and other items of interest.

Northwest Oil Report (Published twice each month by John Newhouse and Dick Bowen, 4204 SW Condor, Portland, OR 97201, phone [503] 224-2156.) Covers Oregon, Washington, and western Idaho. Contains articles on oil, gas, and geothermal activities within each reporting period. Includes current information on drilling activities, Federal and State lease applications, geophysical activities, and Oregon Division of State Lands lease assignments.

Pacific Energy News (Published monthly by Scott Humphrey and Kurt Humphrey, Box 40045, Portland, OR 97240, phone [503] 222-6000.) Covers Oregon and Washington. Contains current information on oil and gas drilling permits and drilling activity updates; Federal leasing information, including parcels available, applications for parcels, and changes in rules; State leasing information, including results of State lease sales and updates on State rule changes for leasing and drilling; and samples of maps that are available through their office. ☐

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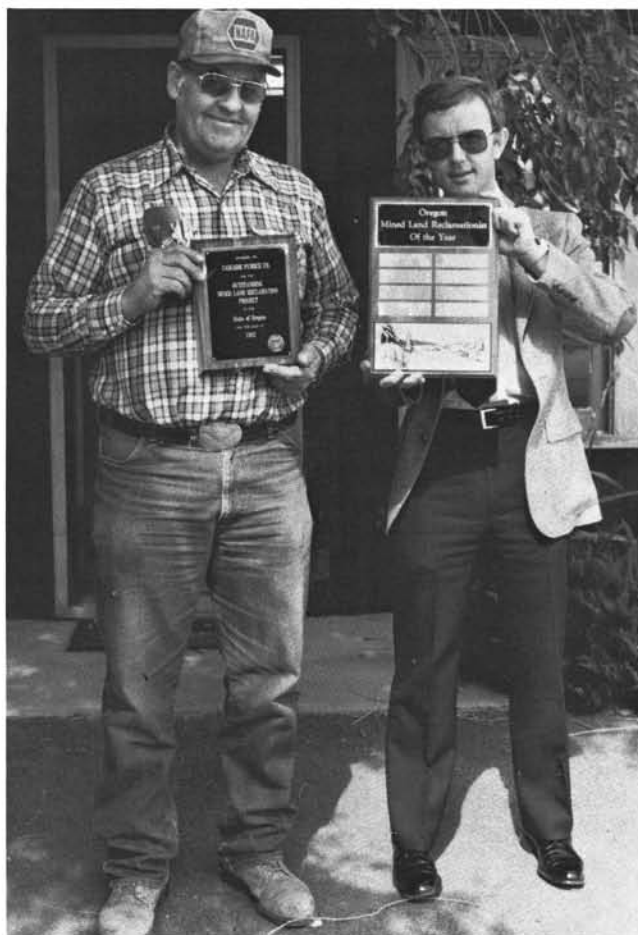
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Cascade Pumice Company is Oregon's outstanding mined land reclamationist for 1982

by Paul F. Lawson, Supervisor, Mined Land Reclamation Program, Albany Field Office,
Oregon Department of Geology and Mineral Industries

Cascade Pumice Company of Bend, Oregon, was the unanimous choice of the selection committee for the first annual award honoring the outstanding surface mined land reclamation project in Oregon. In recognition of this distinction, the company received the plaque shown on the cover of this issue of *Oregon Geology*. Furthermore, theirs is the first name to be engraved on a perpetual plaque to be maintained by the Oregon Department of Geology and Mineral Industries. The selection was made by a committee composed of representatives from industry and environmental interests and this author.

Cascade Pumice Company, which is managed by Charles (Chuck) Clark, has recontoured, respread with topsoil, and restored to agricultural use over forty acres of mined land. Prior to mining, this land was, at best, lightly timbered, marginal grazing land. Now, after mining and reclamation,



Charles (Chuck) Clark (left), Manager of Cascade Pumice Company, Bend, Oregon, holds plaque naming Cascade Pumice as Outstanding Mined Land Reclamation Project in Oregon for 1982. Donald A. Hull (right), State Geologist, holds plaque on which names of each year's winners will be engraved.



Unmined area, typical of conditions prior to mining, belonging to Cascade Pumice Company, near Bend, Oregon.

however, the land can also be used for other purposes, should it be desired and zoned accordingly.

It is especially gratifying to see that the company's reclamation to the present can be considered as having been essentially voluntary, since the involved acreage was "grandfathered" (exempted) from the Surface Mined Land Reclamation Act.

This reclamation project is also an example of concurrent reclamation, accomplished during, rather than after, the mining operations. As successive cells are mined out, similar reclamation will follow. In the meantime, overburden and topsoil are being stored in a stable manner, until their later reapplication. Some leave strips and berms are also maintained as visual and acoustic barriers, as the mining operations continue.

Well-deserving runners-up in the newly created contest included North Santiam Sand and Gravel Company of Stayton, Wayne Spring, General Manager; and Coos County Highway



Stand of ryegrass on land that has been reclaimed after having been mined by Cascade Pumice Company.



Mining operations of Cascade Pumice Company, winner of the Outstanding Mined Land Reclamation Project award for 1982. A portion of one operational area is shown in foreground. In middle distance is reclaimed land which is comparable in grade to cultivated land shown in far right.

Department of Coquille, Wesley (Red) Clark, Coos County Roadmaster/Public Works Director. North Santiam Sand and Gravel converted worked-out pits to aquaculture and, since October 1981, has run a very successful operation of producing, processing, and marketing fresh and processed fish. The Coos County Highway Department mined gravel from a site near Bandon and then left three acres reclaimed and ready for the owner for planting of a cranberry bog.

Some of the criteria governing selection of the winning site were:

1. Compliance with the approved reclamation plan.
2. Imagination and/or innovation in accomplishing the planned reclamation.
3. Future value of the site.
4. Appropriateness to the local environment.
5. Safety.
6. Aesthetics.

The major goal of the Surface Mined Land Reclamation Act of 1972, as amended (ORS 517.750-517.990), is to develop a "future beneficial use" for surface mined land coincident with completion of mining. In practice, such development of beneficial use may also be concurrent with mining. In everyday terms, this means maintaining or enhancing the value of the mined acreage into the future. An additional goal is to leave sites reasonably safe and nonpolluting. To date, over 800 acres of Oregon lands have been reclaimed with the program.

The finalist sites this year well illustrate the very considerable diversity of uses to which mined areas in Oregon are finally assigned. Much acreage goes to various agricultural applications such as dry grazing areas, stock tanks, cultivation, and at least two stock shelters and feed lots. For forestry applications, some areas are replanted to trees, and a few sites are reservoirs for fire fighting. Water-related uses in addition to those listed above include marinas and recreational fisheries, sites related to irrigation, and areas for wildlife management, such as wetlands, nesting areas, shelter, and food resources.

Finally, some sites are used for housing and public buildings (for example, the new building for the Multnomah County Division of Operations and Maintenance is located in one of the County's old gravel pits), for landfills and parks, industrial-commercial construction, and stockpile and equipment pads.

Reclamation involves a wide spectrum of interdisciplinary skills including knowledge of agriculture, forestry, geology, wildlife management, botany, meteorology and effects of weather, water (surface and subsurface), processing requirements essential to different mineral commodities, poisons (natural and introduced), and tools such as ground control or



Leave strip and berm between road and pit at Cascade Pumice Company. The berm is made of stored topsoil overburden that can be respread as a seed base when mining is completed. In the meantime it provides a visual screen and sound barrier.



One of North Santiam Sand and Gravel Company's three trout-rearing ponds situated in mined-out sand and gravel pits near Stayton, Oregon. This company was one of the two runners-up for this year's award for the Outstanding Mined Land Reclamation Project.

stabilization devices, tackifiers, and flocculants. Some knowledge of landscape architecture is often useful.

It is important to note that although the Oregon mineral industry pays the cost of the Mined Land Reclamation Program as well as costs of the actual reclamation, good results have been obtained, and the attitude and cooperation of most of the mineral industry operators are highly commendable.

Support and a large amount of resource material are available both to the operator who conducts reclamation and to specialists, consultants, and professionals who advise and regulate. The National Sand and Gravel Association has made professionally prepared reclamation publications available to its membership. The American Planning Association has similarly prepared and offered publications concerning reclamation to its member planners. Industrial and professional journals frequently provide excellent articles on many aspects of reclamation. For example, *Rock Products* is currently running an outstanding series of articles on reclamation. Furthermore, many universities now have curriculums specifically designed to prepare for entry into the reclamation profession, and some already have departments exclusively for that field.

A fairly substantial reclamation industry has already evolved. A variety of reclamation consultants provide services ranging from providing baseline data to final plans. Reclamation suppliers provide such essential products as seeds, including some hard-to-find species, many ground-stability devices, tackifiers, dust-control chemicals, and flocculants.

Reclamation is obviously an expensive and sometimes very complex function. It is nearly always most economically and usually most effectively accomplished by preplanning and a continuous awareness, while mining, of the ultimate goals. The values of successful reclamation and of profitable, new uses for a mined site are often surprising and can be quite considerable, both to the land owner and to the community.

We are now ready to receive the names of the nominees for the 1983 award. Anyone may nominate a site for consideration. □

Wanted: theses on Oregon geology

The Oregon Department of Geology and Mineral Industries (DOGAMI) has a policy of collecting systematically master's and doctoral theses that provide new information on Oregon geology. Once DOGAMI has decided that acquisition of such a study is desirable, the Department will, for receipt of two bound copies, pay the author \$50 per copy of a master's thesis and \$75 per copy of a doctoral dissertation. Information about such work in progress or completed is always welcome at DOGAMI (see addresses and phone numbers on first inside page of this issue). □

Remember to renew

If your magazine shows an extra stamp on the front cover reminding you that your subscription expires this month, go directly to the back page and RENEW NOW!

Miners' candlesticks—a glimpse of yesterday's mining industry

by N.S. Wagner, geologist, retired, Oregon Department of Geology and Mineral Industries;
present address, 2624 First Street, Baker, Oregon 97814

FOREWORD

Early lode mining in Oregon spanned the period during which candles constituted the dominant source of illumination in virtually all western lode mines. During this period, Oregon had a notable number of inventive miners who were granted patents covering improvements to the holders for these candles. It is as a memorial to the creative efforts of these individuals that the following summation of the "candlelight era" is offered.

INTRODUCTION

The need for illumination in underground mines is met amply today by electric cap lamps powered by rugged, rechargeable batteries worn on the belt. These lamps produce either area or spot lighting at a flick of a switch, and the batteries deliver an abundance of reliable illumination over a full shift or more with one charge.

So universal has the use of these electric lamps become that to many readers it may seem almost unbelievable there are miners still living who mined by candlelight. It is nevertheless a matter of record that the last patent granted by the U.S. Patent Office for a miners' candlestick dates as recently as December 1917 (Ramsdell and Wagner, 1982). Furthermore, it is likewise a documentable fact that candles marketed expressly for use with miners' candlesticks were still listed as "for sale" items in some mining supply catalogs as late as 1938 (e.g., Basche-Sage, 1938).

THE "CANDLELIGHT ERA"

Throughout civilized time, from King Solomon's day to the opening decades of the present century, a diverse assortment of wick lamps dominated the mine-lighting scene. Fueled with greases, lard, or whatever combustible oils were available,

such lamps yielded minimal amounts of uncertain light along with unsavory odors and an abundance of dirty, greasy smoke. Although highly inefficient and undesirable on most counts, they nevertheless, in one form or another, constituted the prevailing source of mine lighting worldwide. Furthermore, they did so even though tallow candles were known to mankind before the time of the Romans. It was not until better quality, harder, slower burning, and melt-resistant candles were developed that the wick-type lamps were replaced by superior forms of lighting. In fact, a substantial amount of the metals used during World War I must have been mined by candlelight.

The date on which candles first became a dominant source of illumination in mines is not known. In this country, the use of candles for subsurface lighting coincides pretty well with the development of lode mining in the western states. Furthermore, their use has a distinctly western flavor in that eastern coal miners continued to use their modern equivalents of the ancient wick-type lamps, even when the use of candles had become firmly established west of the Mississippi. The beginning of the "candlelight era" as described in this article can thus be said to date sometime after the middle of the last century, probably around 1860-1865.

There are three circumstances which combined to trigger, or at least account for, the rather sudden popularity of candles at this time. First, mass-produced candles began to appear in the mid-1850's. Joseph Morgan had invented the first continuous wicking and piston-ejection-type candle-molding machine in 1834. Numerous improvements by others had followed in rapid succession, and the mechanization thus introduced, along with rapid improvements to the machines themselves, had wrought far-reaching changes in the candle-making industry. After all, candles had been largely hand-made, home-made kitchen products before then or, when not home-made,



Oil/wick lamps from pre-candle era (left to right): Clay lamp (Roman period); stirrup lamp (probably French-made but used at Morro Cocha Mine, Peru); Betty lamp (double "crusie" with covering lid, background unknown); open-type double "crusie" (from historic Almaden mercury mining area of Spain); Frog lamp (German); two wick-type cap lamps (typical turn-of-the-century, eastern U.S.).



Bolivian miner wearing lighted "crusie" -type oil lamp on his cap (from Herndon, 1854).

had been the products of commercial plants in which inordinate amounts of manual labor and tedious handling still prevailed.

The second circumstance bearing on the sudden rise in popularity of candles as industrial tools during the closing decades of the last century would today be described as "Research and Development." During the middle of the last century, some talented scientists began seriously looking into the chemistry of candle ingredients to an extent never done before. As a result, they developed stearin candles, a type which possessed physical properties superior to any known previously.

The third circumstance contributing to the revolution in candle making was that large quantities of paraffins became commercially available for the first time in history during the latter decades of the last century, at the same time when facilities for mass producing candles and the research trends with respect to quality enhancement were being nicely perfected. Derived from coal and/or oil-refinery residues, these paraffins were produced by the new and growing coal and oil companies. So greatly did these mineral-based paraffins contribute to the burning control and light output of candles that their use as a candle ingredient soon became important, and some oil companies of the period actually became candle suppliers to the mining industry in the capacity of primary manufacturers of miners' candles.

Once machine-produced candles of an upgraded quality were available to miners at reasonably affordable prices, can-



Wooden candle box, Standard Oil Company of New York. Original in restored Kam Wah Chung Company building, old Chinatown, John Day, Oregon.

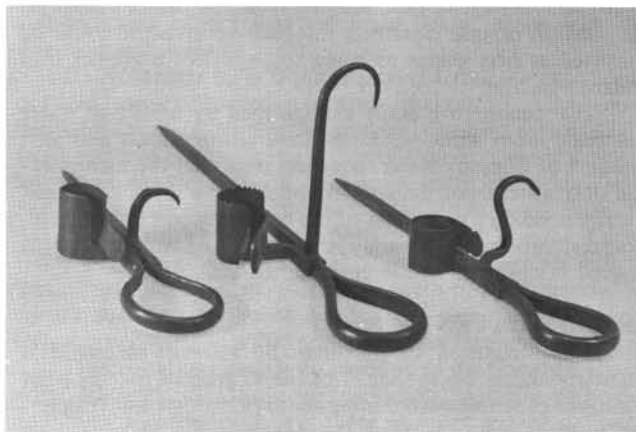
dle use as a source of underground illumination expanded rapidly. One good measure of this expanded use is that between 1872 and 1917 the U.S. Patent Office granted a known total of 87 patents for miners' candlesticks (Ramsdell and Wagner, 1982). Calculated as a yearly average, this amounted to an issuance of about two patents during each of the 45 years between the first and last granted patents.

TYPICAL BLACKSMITH-MADE CANDLESTICKS

The earliest candlestick made for mining use is believed to have been a simple spikelike affair, pointed on one end and with a loop fashioned on the other to serve as a socket for the candle. The purpose of the spike was to facilitate wedging the candlestick into strategically located timbers or rock crevices at the user's work site.

Primitive candlesticks of this blacksmith-made type were supplanted very soon by a more sophisticated product. The improved version featured a handle where the socket of the above-described type had been, with the socket itself relocated to a position on one side of the spike, roughly midway between the spike point and the back end of the handle. In addition, a vertical hook 3-4 in. high was added to the spike at a point roughly opposite the relocated socket. This hook enabled the user to hang the candlestick from a nail or from any protruding surface.

Hand-forged candlesticks conforming to this pattern are generally classified as typical miners' candlesticks. However,



Typical blacksmith-made miners' candlesticks. Note differences in size and shape of hooks and sockets.

because a vast number of individual craftsmen were engaged in their making, no exacting specifications can be offered here. After all, each maker was an artist in his own right when it came to details of size and styling. Thus, candlesticks of this basic design varied from 5 to as much as 18 in. in length, although they commonly ranged from 10 to 12 in. Handles and hooks also differed greatly in shape, size, and styling between makers. Appearance varied appreciably, in that some specimens could be classed as plain, functional, unadorned tools, while others exhibited decorative features reflecting blacksmithing expertise of almost unbelievable attainment. Some specimens were embellished with handcrafted miniature mining tools, lodge emblems, and other forms of decoration which served no functional purpose whatsoever other than to bolster the maker's pride in his craftsmanship and the purchaser's pride in ownership. While most candlesticks of this type were steel, some few were hammered out of copper or even silver.

PATENTED CANDLESTICKS

The patented varieties of miners' candlesticks were usually made in machine shops or foundries, and they exhibited a commercial appearance, accordingly. All patented candlesticks included such basic elements as spikes, hooks, handles, and sockets; however, the manner in which they did so showed great variations, to the extent that in some extreme instances the final product came close to resembling the familiar Swiss Army knife with 20 built-on accessories. For example, a large number of the early inventors patented designs by which the hooks and spikes could be pivoted and/or telescoped back into the handle so as to convert the otherwise ungainly implement into a reasonably manageable pocket piece for carrying and storage. Similarly, many of the inventors developed ways of converting the basic candlestick into a multipurpose tool, as is indicated by the number of patents covering such built-in accessories as cap crimpers, fuse cutters, and even knife blades. Indeed, the multiplicity of ways devised for accomplishing these two objectives alone accounted for about half of the 87 granted patents.

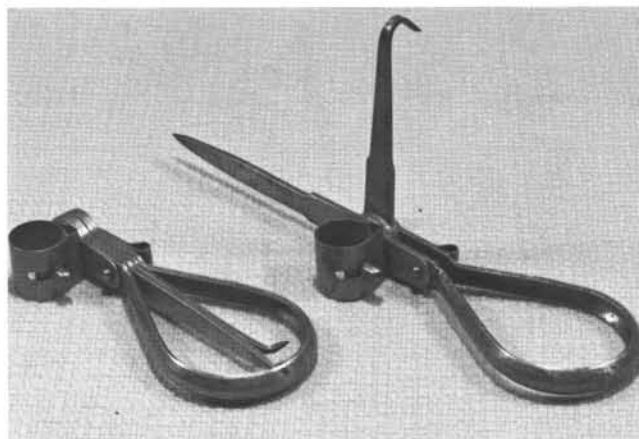
Among the remaining patents were several designs for umbrellalike canopies, to protect the candle from dripping water in wet mines, and socket-hook assemblies that could be detached from the spike, for independent use as cap-mounted units. Fire-conscious inventors perfected snuffers designed to extinguish the flame automatically if a candlestick was carelessly left unattended with the candle still burning.

Given such diversity of inventive inspirations, it follows that while some of the patented end products are easily recognized as being miners' candlesticks, others are not, until scrutinized closely. In fact, judging from the patent drawings, the creation of one extremely imaginative inventor could be dismissed at first glance as being some sort of a gopher trap (Patent 656,209).

Since candles are easily extinguished by wind and water and since many mine workings have strong drafts and vast amounts of dripping water, it would seem that the incorporation of a waterproof match box should have rated as a high-priority accessory with most of the early inventors. Strangely, however, provisions for a reserve supply of dry matches is covered in only two of the granted patents.

OREGON PATENTEES

The distribution of patentees by state of residence is singularly impressive in that 77 of the 87 granted patents went to citizens of ten western mining states (Ramsdell and Wagner, 1982). Most states east of the Mississippi had no citizen patentees at all, while Ohio and Pennsylvania had but one each. Only those areas which were associated with the Great



Peterson-Fielding foldable candlestick, Patent 735,578, shown folded and extended. Made around 1904 or 1905 in Grants Pass, Oregon.

Lakes copper and iron mines fared better. These were Illinois, Michigan, Minnesota, and Wisconsin which, along with Canada, had a total of eight patents between them. Among the western states, Colorado led the pack with a total of 24 patentees. California placed next with eleven, followed by Montana with nine.

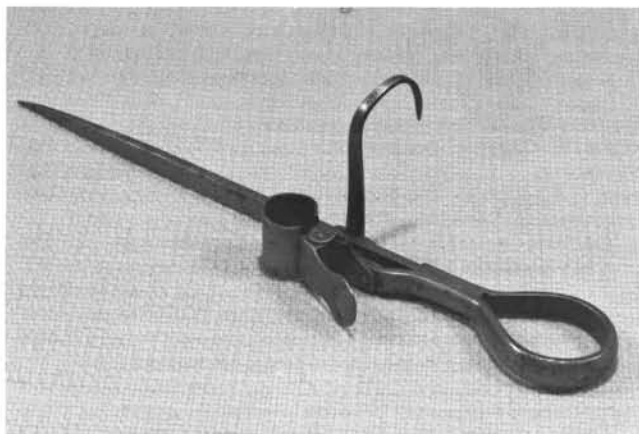
Oregon tied for fifth place with Utah, each having five patentees. The names of the Oregon patentees are as follows:

Name	City	Patent number	Grant date
John Jones	Oregon City	270,316	Jan. 1883
Samuel Peterson and Cornelius Fielding	Grants Pass	735,578	Aug. 1903
Edgar Curtiss	Baker City	766,599	Aug. 1904
Elisha Weed	Medford	824,609	June 1906
Milton Gault	Medford	883,307	Mar. 1908

Each of the above-listed Oregon patentees is to be credited with having contributed substantially meaningful improvements to the design and utility of miners' candlesticks. Because of space limitations, however, only two examples can be pictured and described here. Those selected are the Peterson-Fielding patent of 1903 and the Edgar Curtiss patent of 1904. Both were produced commercially, with the result that fine specimens of each are available for illustrative purposes.

The Peterson-Fielding candlestick is one of the neatest and most sturdily constructed of all the several patented fold-up types. No information is currently at hand concerning the Peterson-Fielding manufacturing facility, other than that it was located in Grants Pass. There is, however, an as yet unconfirmed report to the effect that 1,000 of these sticks were made and shipped to Australia by individuals who leased the plant and temporary manufacturing rights to the patent around 1912.

The primary patent feature of the Curtiss product is a two-piece, spring-loaded socket functionally comparable to the clip on a clipboard. While sockets on most miners' candlesticks of both the patented and unpatented variety had some sort of a provision for making the emplacement and removal of a candle relatively easy, Curtiss' spring-loaded clip type constituted a major improvement. Another aspect of the Curtiss product is that it was so designed that all component parts such as the spike, hook, handle, and socket unit could be fabricated in quantity in finished form for future assembly as



Edgar Curtiss candlestick, Patent 766,599, with two-piece, clip-type socket. Made around 1905 or 1906 in Baker City, Oregon.

and when needed. And, unlike the case with most other candlesticks, this final assembly consisted simply of riveting the component parts together, which eliminated the tedious and costly need for brazing. The components were made in a West Coast machine shop; they were assembled by Curtiss in his home town of Baker, then known as Baker City, and the product was marketed either plain or nickel-plated.

CONCLUSION

No closing paragraph can be written concerning the "candlelight era" without re-emphasizing three facts. One is that the era was very real. The second is that it was distinctively western. And finally, its tapering-off phase came far closer to the present than many readers might have realized before learning the dates on which patents were granted for miners' candlesticks and the even later dates on which miners' candles were still being advertised as "for sale" items in various mine-supply catalogs. After all, December 1917 wasn't all that long ago, and the decade of the 1930's is just barely yesterday.

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- Herndon, W.L., and Gibbon, L., 1954, Exploration of the valley of the Amazon: Executive Document No. 53, 33rd Congress, 1st session, Serial Set No. 722, 339 p.
- Ramsdell, J.D., and Wagner, N.S., 1982, Patents, miners' candlesticks (2nd ed.): Carson City, Nev., privately published, unpag. □

GSOC luncheon meetings announced

The Geological Society of the Oregon Country (GSOC) holds noon meetings in the Standard Plaza Building, 1100 SW Sixth Avenue, Portland, in Room A adjacent to the third floor cafeteria. Topics of upcoming meetings and speakers include:

December 17—*Portland's Leach Botanical Park*, by Charleen M. Holzwarth, Secretary, Leach Garden Friends.

January 7, 1983—*Roadside Geology of Oregon*, by Donald D. Barr, President, GSOC, 1968. □

Corrections

The first sentence in the October "Oil and Gas News" should be changed to read "There has been no drilling at the Mist Gas Field since last month." The location of Oregon Natural Gas Development Company's Patton 32-9 well in Clatsop County was incorrectly given in the November "Oil and Gas News" and should be changed to sec. 9, T. 7 N., R. 8 W. □

Landscape architecture students eligible for quarry beautification competition

The National Crushed Stone Association (NCSA), National Sand and Gravel Association (NSGA), and American Society of Landscape Architects (ASLA) are sponsoring a competition for the best design for beautification and reclamation of a sand and gravel or crushed stone mining site. Entry is open to any school with landscape architecture degree programs in the United States or Canada. Eligibility is limited to undergraduate seniors and graduate students. Prize money will be awarded to the student and his department of landscape architecture.

Students entering the competition are to focus their attention on a proposed or existing site. Following an analysis of the site, they are to develop plans to reduce the adverse effects of the operation on its surroundings, progressing by step-by-step phases to cost-effective final reclamation and end use. Their entries will present a solution containing three distinct components (site analysis, operation beautification plan, and long-term reclamation plan), each on a separate board, along with a 5,000-word narrative description of the project, including a definition of the problem, discussion of plans, and estimated cost analysis. All entries become the property of NCSA or NSGA, who will also assist students in locating potential subjects for their projects.

First entry forms must be submitted by March 18, 1983; final entries by April 8, 1983. Judging will take place in early May 1983. For further information, contact the National Sand and Gravel Association, 900 Spring Street, Silver Spring, MD 20910, or the National Crushed Stone Association, 1415 Elliott Place, NW, Washington, DC 20007. □

PSU student AIME elects new officers

At its October 19, 1982, meeting, the Portland State University Student Chapter of the AIME elected its new officers for the current school year. President is Krista McGowan, Vice President is Alex Dees, and Secretary-Treasurer is Carolyn Browne. Faculty Advisor is Michael L. Cummings, Earth Sciences Department, Portland State University. □

Series of meteors lights up November skies

Six fireballs were observed in Pacific Northwest skies during a 72-hour time interval early in November. Dates, times, and locations of sightings are listed below, along with the direction and angle of flight.

(1) November 6, 7:00 p.m., Beaver Creek, Oregon; path of flight from east to west at an angle of about 15°. (2) November 7, 6:10 p.m., Chehalem Mountains, Oregon; path of flight from east to west parallel to the earth's surface; made a swishing sound. (3) November 8, 5:15 a.m., south of Boeing Field, Seattle-Tacoma area, Washington; path from north to south parallel to earth's surface. (4) November 9, 6:30 a.m., Cedar Hills, Oregon; going to the southeast. (5) November 9, 6:52 a.m., Parkrose, Oregon; path from north to south parallel to earth's surface. (6) November 9, 6:45 p.m., Oregon City, Oregon; dropping at a 20° angle and breaking up.

These sightings have been reported to the Scientific Event Alert Network, Smithsonian Institution. Anyone with any additional information about these or other meteor sightings should contact Dick Pugh, Cleveland High School, 3400 SE 26th Ave., Portland, OR 97202, phone (503) 233-6441. □

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