

# Doodlebug Development Boon To Placer Mining

(Continued from last week)  
To give a general description of the many different types of small plants would be impossible here. The following description shows what the average doodlebug is like in construction and operation.

The average doodlebug is adapted to fairly shallow ground varying from 6 to 20 feet in depth with a soft bedrock or hard-pan. Whether the dredge is of the floating or dry-land type, the operation is somewhat the same. The excavator, generally mounted on caterpillar treads, transverse the bank in front of the washer and delivers the excavated material to the hopper. To save time in spotting the bucket over the hopper the hopper should be of generous size at least 10 feet, or better, 12 feet. This in turn means that the hopper bottom will not have enough slope to the material to slide readily down to the screen. Many of the floating dredges depend upon the rocking bottom of the dredge caused by the depositing of the material into the hopper to slide the material into the screens. Many forms of mechanical feeders have been developed by operators, but in the long run they return to the general type of hopper. The usual tendency is to keep several streams of water shooting with fair force into the hopper and washing the material into the screen. Some operators have kept an attendant on the hopper with a large hose to wash the material into the screen. The hoppers should be of fairly heavy construction, well supported and reinforced to stand the continual shock from the dropping of tons of gravel into the hopper.

A revolving screen four or five feet in diameter and at least 16 feet in length of actual screening surface and preferably perforated with 3-8 to 7-16 inch round holes will be required for a capacity of 2,000 to 2,500 cubic yards per day of the average placer ground. In placer dredging the operator should be thoroughly acquainted with the ground which he is working. The percentage of fines in the ground should be known so that the type and size of the screen be estimated fairly well. Direct gears and chain drive on revolving screens are not too successful and should be avoided.

The best type of screen now being used has heavy tread rings of cast steel near each end, supported on two pairs of heavy, large diameter cast steel rollers. The pair of rollers at the lower end of the screen are powered by bevel gearing, which transmits the power to the rollers on the screen. The grade on the screen varies from 1 1/4 to 2 1/4 inches per foot. The steep grade of 2 1/4 inches per foot may be used on material that is free and sandy and does not require much washing to put the fines through the screen.

An eight-inch centrifugal pump of good type and design, running at a speed which will give 60 to 75 feet of lift will furnish water for an 2,000 to 2,500 cubic yard plant. The dredge should also be furnished with a two or three-inch pump for pumping, clean-up, fire protection and cleanings of the decks. Where the dredge is floating a small hand pump of some type should be kept for hull drainage.

For a plant with a four-foot diameter screen, a 24-inch belt conveyor running at about 300 feet per minute, mounted on a light but substantial steel truss framework, is sufficient for the stacking of the tailings. During the past 30 years of dredging rubber belts have been developed which are really excellent for the removal of tailings and giving very long service. They seem very high priced to those new in the business of dredging, but those with experience in this field are glad to pay the price and get the goods and service.

The proper screening of the gravel is the first very important requisite for the proper saving of the values contained. Since it takes more water to wash the gravel in the screen than it would over the gold saving tables many prefer to add all necessary water for washing through the nozzles which wash the gravel in the screen. Feeders with adjustable valves should be provided so that additional water may be added to the gravel passing over the tables when required. It is also very essential that the pulp be uniformly distributed over the tables. This distribution of the pulp over the tables has often been the difference between the success and the failure of an operation. Many of the riffles used in the smaller dredges are direct copies

of the standard type of placer dredge. The type of distribution which seems most successful was patented in 1905 on a dredge at Orville, California.

With this system the fines, after passing the screen, are caught in a steel collecting pan under the screen. The collecting pan slopes toward the head of the sluices with a slope of 1 1/2 inches to the foot. The pulp passes through this sluice over the riffles and at the lower end is subdivided into equal portions, which pass through launders to the head of the secondary tables in which it is spread out over twice or three times the width over which it passed in the primary sluice. This spreading out effects a secondary concentration. The secondary tables slope toward the stern of the washer enabling ready talling disposal. This system of concentration has been successful in over 100 dredges, and many plants which were unsuccessful with other types of riffles were remodeled and made successful and profitable with this system.

The great advantage of this practice is that unless the operator is in exceptionally high ground, it will not be necessary to clean up more than once a month instead of every week.

There is a great variety of riffles in use on dredges, but the standard seems to be a riffle made of one-inch angle irons or the wood riffles with steel or rubber face. The angle iron riffles are more sturdy and wear longer than either of the other types, though there are now on the market new all-rubber riffles which promise to be superior to all the other types and are said to wear many times longer.

Some of the newer dry-land machines like the Judson-Pacific are equipped with the bowl type gold saving devices or jigs. The use of jigs, bowls and centrifugal amalgamators are better adapted to the dry-land rigs than the floating because of the stability of the outfit. The bobbing of a floating dredge from the deposition of the material in the hopper interferes with the operation of the bowls and jigs by the shifting of the vertical axis. Jigs also depend upon stable foundations so that water levels may be properly maintained.

The floating type, for successful operation should have a fairly soft bedrock that may be scraped clean with the bucket or much of the values will be left behind. The standard type of the dredge has the advantage of the buckets following closely and being moved over the bedrock much more evenly, thus cleaning more thoroughly than is possible with a dragline bucket. The dry-land type of washer enables the bedrock to be studied and carefully cleaned by hand, which is seldom necessary.

In this article, I have tried to present the development and the process of naming the new industry of manufacturing and operating small two-unit gold dredges. Though the industry is still in the development stage and no satisfactory conclusion has been reached in its naming, it is thriving and is being successful. It is understood that all washers do not hold to the description given, but all follow the same principle and the field is rapidly standardizing.

## EXPLOSION KILLS ATLANTIC MINER

TOWNSEND—In the third major mine accident in Broadwater county in two weeks Penn Gray was fatally injured in explosion in the Atlantic mine near Hessel Oct. 28.

His partner, Charles Livermore, suffered cuts, bruises, and serious eye injuries and is hospitalized in Three Forks.

Gray's back was broken and his body riddled with rocks. He died soon after the accident in a Townsend hospital.

Gray, Livermore, and Pat Carter had been operating the mine for almost two years with average success. Gray was a native of Libby but had resided at Stevensville until about two years ago.

On Oct. 16 John Larson lost his life in a pre-mature blast and two days later Cleve Murphy was injured seriously by an explosion.



## Modern Mining Student Can Take It Tough

Did somebody say that the new generation of mining engineers can't take it?

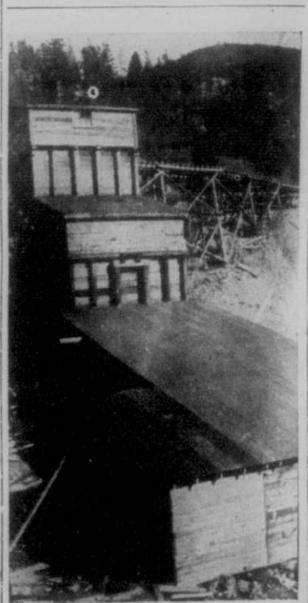
With Montana School of Mines gridders looking like champions in the Small College Conference, Colorado School of Mines at the top of the heap in the Rocky Mountain conference, New Mexico Mines leaving a trail of destruction on the lower border, and Texas College Mines playing giant killer in the southwest, the mining college football teams are becoming squads to be feared and respected by other colleges.

Tough men playing a tough game for schools that demand academic proficiency should insure a plentiful supply of brainy, two-fisted mining engineers for several years to come.

## NEW MILL AT STAR MINE IS OPERATING

The new 50-ton mill at the Star mine at Nelhart, built by Mrs. George Reeves of Conrad, is now in operation, making an excellent recovery, according to Mrs. Reeves who was a visitor in Great Falls en route to the mine. Mrs. Reeves received the property as part of an estate in 1921 and she has in recent years driven the tunnel 1,000 feet, to a total of 2,000 feet, where a surprising vein of gold-bearing ore was encountered. This is a district that has heretofore produced only silver.

The concentrates from the new



This is a snapshot of the new mill at the Star mine at Nelhart which is now in successful operation, working on newly discovered high grade ore.

ore during the first week of operation showed an average of 2,325 ounces of gold, 139.05 ounces of silver, 43 per cent lead and 14 per cent zinc. The 50-ton mill is a Union Iron works plant with jaw crusher, Union ball mill, classifier and six flotation cells. It was built by Louis B. "Bunny" Stark, superintendent, with Harry Ellis of Dupuyer. The mill will be operated for some time on ore now on the dump which is being transported to the mill by dragline. Meantime a crew of men is starting to develop a vein at 1400 feet which has run from four to 14 feet wide for a distance of 100 feet and in a 40-foot raise. It is good mill feed that will keep the mill working until the new ore at 2,000 feet can be developed.

The London mine, above the Star is held by Mrs. Reeves under lease and bond and will be developed in the near future. The London dump is said to contain good mill feed,

## FAIRVIEW MINE COMPANY REORGANIZING

Fairview Gold Mines, Inc., of Helena is now reorganizing with a view to building a mill and increasing the development work on its mine at Sheridan, Mont., where sensational shipping ore has been mined in the past. L. E. Place of Great Falls has been chosen trustee of the reorganization group. The capital will be increased from \$50,000 to \$75,000 with 5-cent par value stock, of which 500,000 shares will be issued at the outset to take over the mines and equipment and to pay outstanding obligations of Fairview. The other 1,000,000 shares will be placed in the treasury or sold for development work and the purchase of a mill. The Fairview stockholders are expected to receive the new stock in exchange for the old.

While the mine was being operated under lease by Byron Felton it netted a profit of \$4,300 for Fairview but with the accidental death of Felton the owners decided to refinance.

The Fairview mine showed a gross profit of \$10,000 in 1938. About \$40,000 has been spent in development work and the mine has shipped \$60,000 worth of high grade ore. In the development of this high grade a considerable amount of milling ore has been mined and blocked out which will provide adequate mill feed to justify the mill. Place plans to have the new mill in operation by May 1.

also. Twelve men are employed at the Star mine and mill at the present time.

The start of the mine was recently celebrated by all members of the crew and their families at a dinner held at Dupuyer. There were 36 present.

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## COPPER OUTLETS DISCUSSED

ANACONDA—Many new uses for copper were described in an interesting address illustrated with 100 samples before the Anaconda Rotary club last Monday by P. E. G. Spillsbury of Los Angeles, western representative and development engineer of the American Brass company and consulting engineer for the Anaconda Wire and Cable company. Mr. Spillsbury entertained his listeners with a description of recent developments in the new uses for copper in the U. S. Navy, automobile industry, airplane engineering, air conditioning and many other fields.

He stated that the American Brass company now has 25,000 different items which are manufactured with copper as an important part of their composition. Among the alloys, in which copper is contained, he mentioned super-nickel, everdur, beryllium, everdur-steel, aluminum-bronze and others.

"Anaconda Copper Mining company has been outstanding in providing outlets for copper," Mr. Spillsbury declared. He told of the action of the U. S. Navy in replacing stainless steel with super-nickel pipes, condenser tubes and condenser head plates for destroyers. "Consequently more copper is being sold to the Navy than ever before in history," he said.

"American Brass company developed everdur as the greatest selling non-ferrous alloy in the country," Mr. Spillsbury declared in demonstrating samples of the product. He said that the alloy has the strength of steel and the resistance power of copper. Uses he mentioned were for hot water heating tanks, ducts, screws, bolts, nuts and heavier fastenings, tie rods, bulkheads, I-beams, electrical conduits and in architectural re-inforcing.

Mr. Spillsbury exhibited beryllium copper tools which he said made no spark and were valuable in workshops in which dangerous gases might be present and there was danger of explosion from the spark caused by friction of tools.

Mr. Spillsbury showed pipe samples varying from three one-thousandths of an inch to five-inches in diameter. He told of their uses in airplane engines, flexible tubes for oil and gas and air conditioning pumps.

Praises Frederick Laist. He praised Frederick Laist, former general superintendent of the Anaconda Reduction works, for his development of the electro-sheet copper which he said is not confined to Christmas cards and stationery but is widely used for reinforcing concrete foundations to replace felt and asphalt which has deteriorated and has needed replacement.

Closing Quotations on the STANDARD STOCK EXCHANGE SPOKANE By GIBSON ASSOCIATES, INC. Great Falls, Montana

Noon Closing November 3, 1939

Clayton Silver	26 30
Dayrock	51 65
Goconda	4 1/2 7
Hecla Mining	7.00 7.50
Grandview	10 1/2 11 1/2
Jack Waite	28 35
Metaline	50 55
North Butte	62 65
Mont. Consolidated	3 1/2 5
Sherman Lead	30 34
Standard Silver Lead	14 20
Tamarack	34 38 1/2
Bunker Hill	14.90 15.50

CURBS

Callahan	1.0 2.30
Pend Orele	2.22 2.40
Premier Gold	1.15 1.28
Sidney	3 1/2 5 1/2

OVER THE COUNTER

Wash. Water Power	104.50
Mont. Power, Pfd.	103.00 104.00

METALS

Lead, New York	.0550
Zinc, New York	.0650
Copper, Domestic	.12 1/2

## NEW POWER UNITS FOR LIBBY MINE

An announcement is made by the Glacier Silver Lead Mining company of its purchase of twin semi-Diesel engines of 220 horse power each and two 440-volt generators with exciters, switchboard and transformers, to supplement its hydroelectric power plant at the mine and mill, eight miles south of Libby, Mont.

Concrete foundations for the support of this 40-ton Diesel plant are under construction. F. W. Kiesling, secretary-treasurer, Spokane, reports in behalf of the board of directors. When the foundations have been completed and cured, the new equipment will be hauled to the mine, installed and made ready for use.

With this additional power, the Glacier Silver Lead will have sufficient power to operate the mill throughout the year.

The current assessment of half a cent a share will become delinquent November 15.

GOLDEN LEAF OPERATING BANNACK—The Golden Messenger Corp. of Helena is operating the Golden Leaf mill and mine here with Gunnar Johnson in charge.

HAVE YOU A Mine for Sale? NO BROKERAGE Write for Details to Property Department Metals & Minerals Research Bureau 9 Sutter St. San Francisco or your Local Chamber of Commerce

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# SAMPLING

"is the process of obtaining from a lot of ore a smaller quantity that contains, in unchanged percentages, all the constituents of the original lot"

—U. S. BUREAU OF MINES.

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