

accurately indicated by the lamps. If one electrode should touch the bath its pilot light would instantly go black. These lights, therefore, show the exact position of the electrodes at all times. For three-phase operation it is necessary merely to add one more lamp.

A more detailed account is presented in a report issued by the bureau in mimeograph form.

THAWING FROZEN GRAVEL IN PLACER MINING.

By Charles Janin.

THE working of frozen gravels, a special problem in placer mining, has received much attention in Alaska and the Yukon Territory. The expense of thawing with steam points, the chief method of thawing frozen gravel for drift, surface mining, or dredging operations, has prevented the working of the lower-grade gravels in the frozen areas. About 1915, different persons started experimenting with an entirely new plan for softening the gravel. Water at natural summer temperature was applied by means of holes drilled through the frozen muck and gravel to bedrock, with satisfactory results. The method was taken up in the Dawson field by the Yukon Gold Company and the Canadian Klondike Company; at Nome, by the Alaska Mines Corporation, on Candle Creek by Edward Pearce, and others. While there is much to be learned regarding its practical application, it has passed the experimental stage and is proving of great value to the gold-mining industry.

Its successful application where water is obtainable under pressure without pumping will make large areas of low-grade ground available for dredging, and ground that previously has been considered of little value now will be of economic importance.

Details are presented in Technical Paper 309, "Recent Progress in the Thawing of Frozen Gravel in Placer Mining," published by the Bureau of Mines.

The Effect of Nascent Hydrogen on Hardening Steel Magnets. JOHN COULSON. (*Phys. Rev.*, July, 1922).—Fifty or more steel bar magnets, 14.4 cm. long, were quenched to glass hardness at 850° or were hardened at 700°. They were then magnetized to saturation inside of a solenoid. After this they were alternately