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A NOVEL FEATURE IN MINING.

At the Arroyo Seco Mine, about three miles from the town of Ione, in California, there is now in operation an entirely new method of placer mining. This mine is situated in the bed of a dry creek which at some remote period had been a river course and had been gradually filled, by the erosive action of the water, until the gold-bearing gravel lay buried under about twenty-five feet of dirt and stone. This "pay dirt" as it is called rests upon bed rock, is from five to ten feet in depth, and quite rich. Although this property has been known to be worth working for a long time, no method of operating was devised until recently, on account of the great quantity of water lying near the bed rock, and for which no drainage could be obtained.

The principal feature of the plan now working successfully consists of a large crane, shown in the accompanying engraving, for moving the waste dirt. The engine and boiler room is built on wheels running on a track and contains two forty-eight inch upright boilers and a pair of 9 x 16 inch engines, placed on the same floor as the boilers. These engines move a reel carrying a $1\frac{1}{8}$ inch steel cable, that runs out on the wooden boom and operates the box, as shown. The boom is 118 feet long, is 12 x 12 inches at each end, and is 12 x 24 inches at the center, is well guyed with steel ropes, and is strong enough to raise five or six tons of earth. Operations are commenced by first shoveling the top dirt into the box, then hoisting and swinging the boom at the same time, and finally dumping the dirt in a place completely

out of the way. The engineer in the look-out house at the head of the mast attends to hoisting, swinging, and dumping the box.

Having thus exposed the pay dirt, water is conducted to the pipe to wash the gravel in sluice

water, the whole weight resting on two 26 inch anti-friction wheels. The vertical pumps are run directly by two 15 inch Knight turbine waterwheels, fed from the main supply pipe, the fall being of 74 feet. One of these pumps is capable of raising all the water from the mine, together with the sluice water; the other is used during the rainy season of the year.

This machinery was designed and made by Messrs. Knight & Co., of Sutter Creek, Cal., the patentees and manufacturers of the well known Knight waterwheel.

SMOKE CONDENSED BY MEANS OF ELECTRICITY.

From Tyndall's experiments on the dust found in the air, Messrs. Clark and Lodge observed that a body at a higher temperature than its surrounding medium is enveloped in a thin stratum of air absolutely free from dust.

Mr. Lodge, of Liverpool, conceived the idea of studying this phenomenon, making use of electricity; he remarked that electrical discharges produced at high tension by a static machine possessed the property of condensing dust and smoke of all kinds.

This was not slow in finding a ready application in metallurgy, for condensing the dangerous fumes and dust of lead in the factory of Messrs. Walker, Parker & Co., one of the largest of its kind in England. The results secured were remarkable, and the attention of students was particularly called to this new method of treatment, because it had a two-fold bearing—on the health of the workmen and on the economy of the process.

(Continued on page 260.)

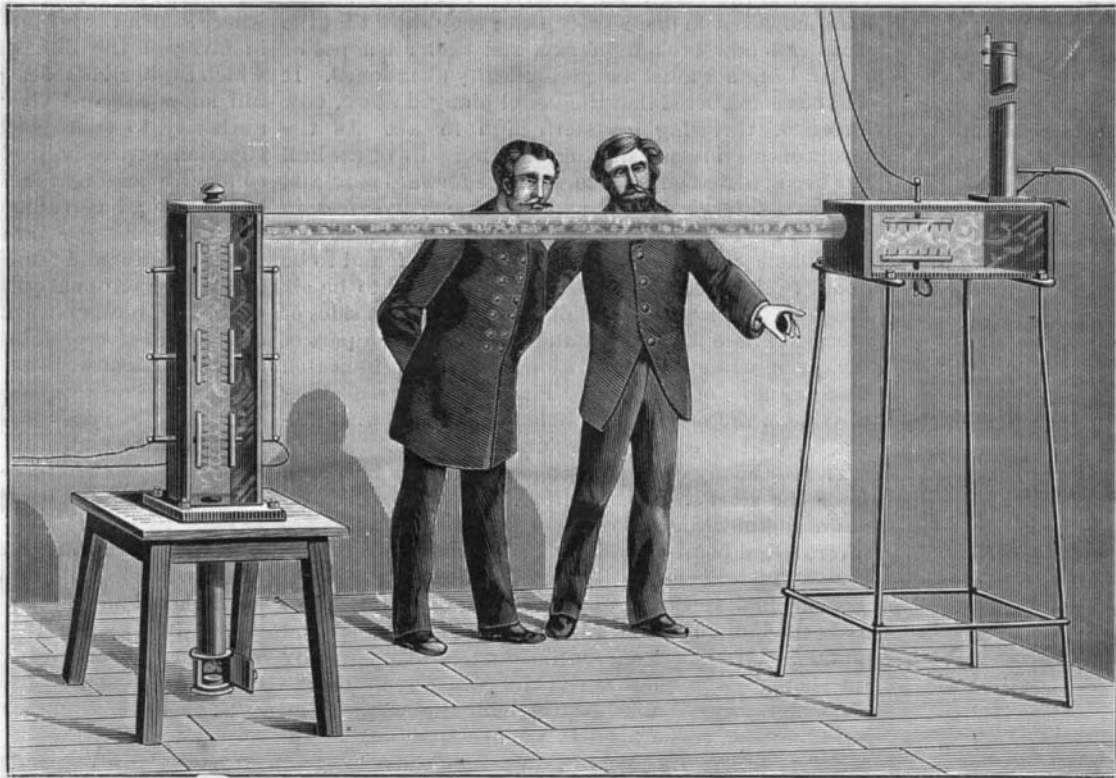
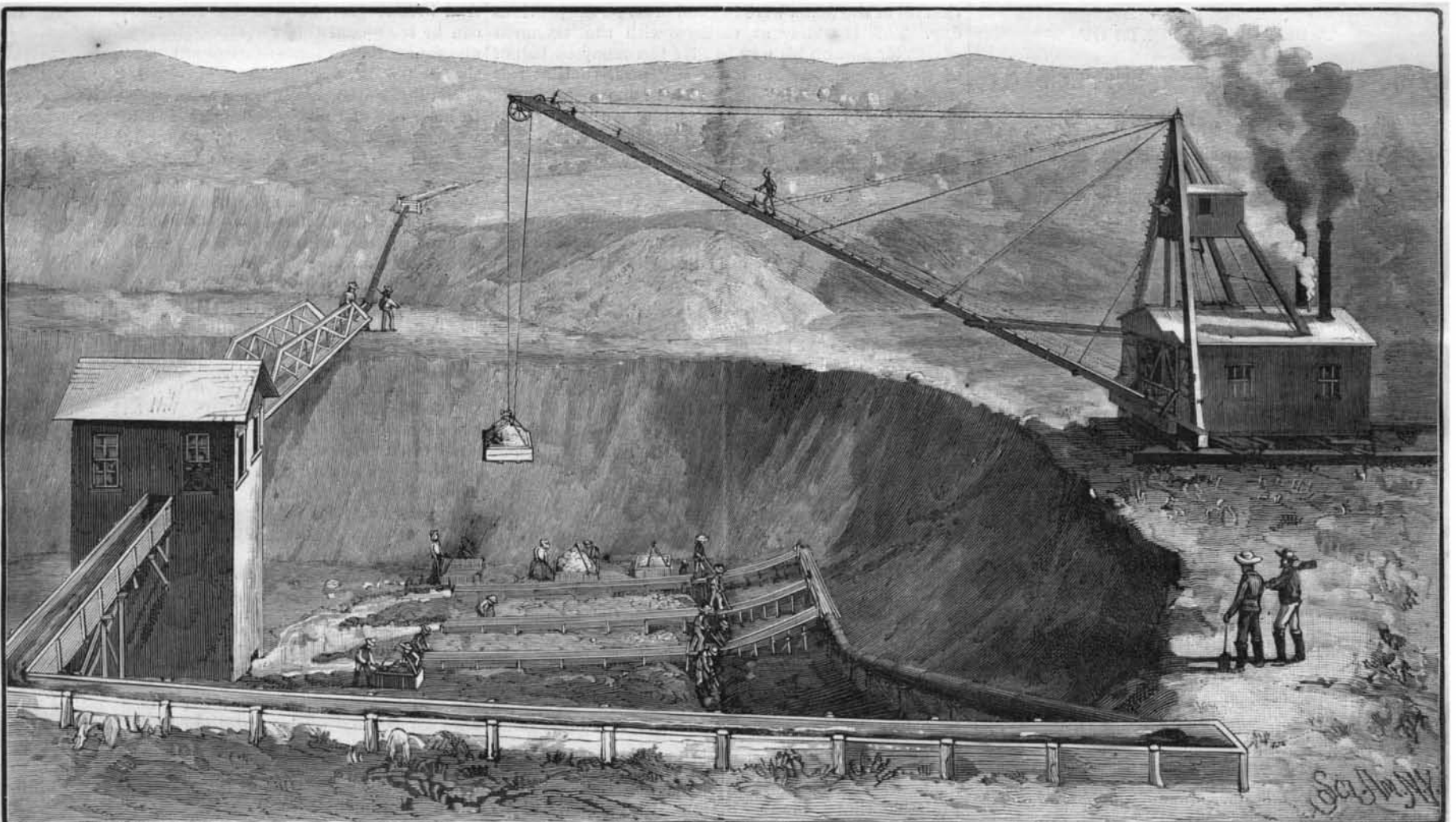


Fig 1.—LARGE APPARATUS FOR CONDENSING SMOKE BY ELECTRICITY.

boxes, in the same way as that ordinarily pursued in placer mining. The water and sand, after leaving the sluices, flow to the sump, in which there are two submerged centrifugal pumps of peculiar pattern, and which were expressly designed for this work. Each of them has two 11 inch discharge pipes; the capacity is 600 miner's inches of water, or 900 cubic feet per minute. These pumps have nostepor bearings under

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NOVEL MINING MACHINERY IN OPERATION AT THE ARROYO SECO MINE, CALIFORNIA.