

H. F. ENGLAND MAKES MODEL OF NEW TYPE WASHING PLANT

Quartzburg
Plant

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The great accumulation of tailings from dredging operations is one of the eye-sores of modern mining practice. In an effort to reclaim such dredged land and to present a more pleasing landscape, many ideas and methods have been tried with varying degrees of success by both bucket-line and drag-line dredging companies. The Oregon State Department of Geology and Mineral Industries has been studying the question from various angles, but incomplete data seem to show that with present methods an operator can only hope to reclaim very rich land. It would be solely with improved present methods and a new type of operation that "marginal" or low gold-yield land could be reclaimed for future farming generations.

RETURNS FINE SOIL TO SURFACE

A new type of dredge, involving many revolutionary changes in construction, which is expected to permit the return of the fine soil to the surface of the boulder piles with the consequent reclamation of the land has been originated by Harry F. England, operator of the England and Hillyard drag-line on Dixie creek, above Prairie City, Oregon, and inventor of numerous innovations in dredge construction. A six-foot, welded-steel working model of the new type boat is nearing completion and is soon to be tested in a 15-foot tank, charged with gravels and overburden. The trommel screen is set horizontally within the boat at an elevation of only a few feet above the surface of the steel pontoons. The height of the hopper is thus reduced from about 14 feet to seven feet above deck level. The gravel material is propelled through the trommel by a worm spiral and hence travels much further than in the standard inclined type. The over-size is expelled directly into the pond from the end of the trommel which projects several feet beyond the end of the boat where it falls to the bottom. Fines from the trommel fall into quiet water in a large sump at the hull lying mostly below pond level. From here they are raised by a submerged sand pump to the sluice boxes on the top deck of the boat above the trommel, which carries them out so that they fall upon or beyond the over-size pile. Since the fines are thus filtered through gravel instead of being dumped back into the pond, it is probable that less material will be carried away in the muddy water; and the fines will lie definitely upon the coarser material.

RECLAIMING SOIL EXPECTED

Under-current sands are treated in jigs and amalgamated upon the boat where room for two large jig set-ups is provided. Extra wash-water is pumped through the welded angle-iron framework of the boat itself. Spray tubes within the trommel will be of rubber to better

resist rock-abrasion. The trommel itself lies under a track and car which in combination with the drag-line cable can be used to remove and replace the entire screen itself within a few hours.

When doubt as to recovery occurs, the sluice tails can be returned to the sump for re-treatment by a simple gate arrangement.

Although the ability to reclaim the soil is expected to be the most important feature of the new boat, large power savings are hoped for from the elimination of the stacker and the lowering of the hopper elevation; and more complete reduction of clay-balls and heavy soil should be provided by the new trommel design.

Although the date of the test has not as yet been set, considerable interest in the project has already been aroused among the dredging fraternities and the operation of the model should be observed by many critical eyes.

H.F. England & Co
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NEW DREDGE DESIGNED FOR RE-SURFACING GROUND WORKED

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A working, scale model of a new gold dredge that, it is claimed, will not destroy farming land nor create unsightly piles of tailing gravel has been completed by Harry England, Oregon dredge operator at Prairie City. The completed, all steel, 6-foot model of the radically new type "boat" will, if successful, re-surface the ground that has been dug by *putting the boulders and coarse material on the bottom and fines and silt in levelled-off fashion on the surface.*

The finished model was examined in Prairie City recently by Earl K. Nixon, Director, and John Eliot Allen, Field Geologist, of the State Department of Geology and Mineral Industries. "It looks as if England 'has something' here," Nixon commented. "Of course, there will be bugs to work out, but I believe both the design and basic idea are essentially sound, and if so, this new development may have a far-reaching effect on dredge practice, not only in Oregon and California but wherever dredges are used to recover mineral wealth."

England, operating a drag line dredge near Prairie City, is a pioneer in the designing of the common type of gold dredges, his experience dating from the birth of the "doodlebug", or drag line dredges, near Oroville, California, about seven years ago. The present new model, a drag line type, could be adapted to standard, bucket line operation without impairment of its most desirable feature—re-surfacing.

New and unique features of the present design are: placement of the gold-saving apparatus above the screen so that the fine tailings will run out by gravity to a point some distance behind the boat; elimination of the stacker completely, with the dumping of the boulders and oversize from the end of the screen directly into the pond where they form a dam to prevent the fines crowding under the boat; pumping of the fines from the sump under the screen, up to the recovery apparatus; and lowering by 7½ feet the height to which all gravel as dug must be hoisted into the hopper.

It appears that the lowering of the screen and hopper by several feet will materially reduce the power consumption of the digging shovel, and also speed up the digging, thus increasing the capacity of the boat. Several innovations are incorporated in England's design. The screen instead of being inclined, is horizontal and the passage of the oversize through the length of the screen is accomplished by a spiral flange welded to the inside of the screen. By using a sand pump to elevate the fines from the screen to the tables above, plenty of head room is available for rougher, cleaner, scavenger jigs, and amalgamator. Over-flow devices are provided so that if any or all jigs plug, the gold-bearing fines are returned to the sump and back into the circuit

where they cannot get away without going over the riffles. The main pump for supplying water to screen jets is submerged in a compartment in the hull where it is always in prime and requires no suction. There is practically no plumbing on the boat, as the supports and braces of the superstructure are hollow, being made of welded angle iron, and serve as piping. A by-pass in the tailings sluices permits the operator to control the amount of fines that are returned to the top of the tailings pile or to the pond.

Most important, of course, is the fact that England's dredge is designed to put the boulders and coarse rock back into the bottom of the tailings piles and the fines on top where little or no leveling should be required. The designer believes that, by proper control of the sluice by-pass, the land behind the dredge can be "made to order" by adjusting the deposition of the finer material. He believes also that by reversing the order of deposition, namely, *placing the boulders and coarse material on bottom and the finer gravel and silt above, that the swell of the ground—the height of the tailings will be considerably reduced.*

It is the designer's belief that the cost of operating a re-surfacing dredge of his new design will compare favorably with the cost of present types of operations.

England has taken steps to protect his design and process against copy.

Nixon stated that, although about 90% of the dredge land in Oregon is either waste or marginal land, a re-surfacing dredge would be a desirable development, especially in certain places in California and in certain parts of the John Day valley in Oregon. In the latter place, he stated, some of the land raises good stock feed and there is some basis for objection to dredging without resoiling; but, on the whole, he continued, dredging is opposed by a relatively few persons who are not well-informed concerning the economics involved, such as land values, financial benefits to the State of Oregon operations, and the very small percentage of farm land which may be considered as potential dredging ground. In this connection, Nixon said, the State Department of Geology and Mineral Industries has for several months been accumulating data and making a study of dredging economics in relation to land values with the idea of issuing a report dealing with the economic feasibility of re-surfacing where certain unusual conditions obtain