

working the lodes which offer only a small return and have been neglected hitherto for that reason, and, finally, many of the silver-lead mines will be reopened as lead mines alone, and worked profitably for their lead contents without respect to the price of silver, the latter being regarded as a by-product, as in the case of the argentiferous copper ores of Montana. The readjustment of the wages of labor in those regions, which have long been out of proportion to the cost of living, and which is certain to come about, will help to make this possible. Then will operations in the Rocky Mountains be re-established on a sounder business basis than heretofore, and the fever of the industry which has led to the making of so many great fortunes and the loss of so many more will have been allayed.—*The Engineering and Mining Journal.*

THE ROESSLER-EDELMANN PROCESS OF DESILVERIZING LEAD WITH ALUMINUM AND ZINC.

In the process for desilverizing lead by spelter there is obtained desilverized lead with about 0.6 per cent. of zinc on the one part and a mixture of lead with zinc and silver intermixed with oxides of zinc and lead, the so-called zinc-scum, on the other. By smelting this scum only a part of the lead is removed, while a great deal of it remains in the zinc-scum with the oxides of zinc and lead, whence it cannot be removed by liqation even at red-heat. The oxides prevent the metallic particles from collecting out of the mass; a complete separation of lead from the zinc-silver alloy is therefore not obtainable. For working up this oxidized product containing zinc-silver with some lead, the "rich-scum" distillation has been used at most refining works. The result is a concentrated silver-lead for cupellation. The litharge produced must be reduced and the refined lead returned anew to the desilverizing process.

The old process, therefore, comprises the following operations: 1. Softening of the base bullion; 2. Desilverizing the lead by a repeated addition of spelter and cooling the lead in the kettle from two to six times. The number of these operations depends on the contents of silver and of some impurities remaining in the lead; 3. Liqation of the zinc-scum; 4. Distillation of the concentrated zinc-scum; 5. Cupellation of silver-lead; 6. Reviving the litharge and other products of cupellation; 7. Desilverizing the lead obtained by the reviving process.

The new Roessler-Edelmann process being based upon the use of an alloy of zinc and aluminum for the desilverization of lead offrs, it is claimed, considerable advantages over the old process with ordinary zinc. The quantity of aluminum required does not exceed 0.5 per cent. of the spelter applied. This alloy is very little disposed to oxidation and retains its bright metallic surface even at red-heat. The lead treated with such an alloy of aluminum-zinc remains likewise nearly completely bright on the surface. Lead rich in silver requires, of course, more spelter than poor; the quantity of silver which dissolves in the lead rises with the temperature of the latter. Hitherto the temperature of the lead had to be kept as low as possible in order to restrict losses by oxidation. As the addition of the aluminum alloy nearly prevents oxidation the temperature may be raised as far as required without harm. We are, therefore, able to saturate the silver-lead at one operation with the quantity required for extraction of the total contents in silver, separating the alloy of silver and zinc with some lead upon subsequent cooling of the kettle.

While hitherto for the desilverization of lead with 5 per cent. or 1 per cent. of silver four to six additions of spelter were required, such lead can be desilverized at one operation down to 0.0004 per cent. of silver. This means a saving of labor of about 50 per cent. on one hand and an increase of capacity of the plant of 50 per cent. on the other. No modification of the ordinary plant is required for the process. The main advantage, however, is neither the saving of labor nor the increase of capacity of the plant, but the fact that the greatest part of the silver is collected in an alloy instead of in a mixture of oxides, from which it can be extracted only with considerable losses. The alloy of zinc-silver with lead, obtained by desilverizing silver-lead with aluminum-zinc alloy, is free of oxides, and therefore it can easily be delivered from a surplus of lead by liqation, by which operation an alloy is obtained containing about 20 to 40 per cent. silver, 3 to 4 per cent. lead; 1.5 to 2 per cent. copper, and 76.5 to 84 per cent. zinc, with small quantities of Al, Fe, As, Sb, and separating as a homogeneous and liquid mass from the lead, which latter is to be returned to the process.

This alloy is ladled at once into molds and thus cast into anode-plates for electrolysis. The electrolytic-zinc is very pure; it consists of an average of 0.0099 per cent. Fe; 0.0114 per cent. Cu; 0.0341 per cent. Pb; traces of Ag, As and Sb; 99.9446 per cent. Zn. This exceedingly pure metal commands, of course, a price much superior to that of ordinary spelter. The costs of the electrolysis are nearly covered by the higher value of the electrolytic-zinc. The remainder of the anodes forms a slime rich in silver; it consists on an average of 80 to 74 per cent. Ag; 12 to 10 per cent. Pb; 1.5 to 5 per cent. Cu; 0.2 to 0.5 per cent. Zn, with impurities of some As, Sb and Fe. It is melted to fine silver.

From the description above it is evident that the cupellation is not needed. In place of it a short fusing process on the test of the silver-slimes is substituted. As hardly any litharge and hearth is to be treated in the smelting furnaces, the losses of metal unavoidable there are prevented. The quantity of lead to be desilverized is reduced, and a large product of lead obtained at the first operation.

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DRAUGHTS-CHECKERS

All communications to this department must be addressed directly to the Checker Editor, Mr. W. Forsyth, 36 Grafton St.

GAME 232—"SUTER."

Played recently between S Granville (black) and W. Forsyth (white) in the latter's practice for his championship match with E Kelly.

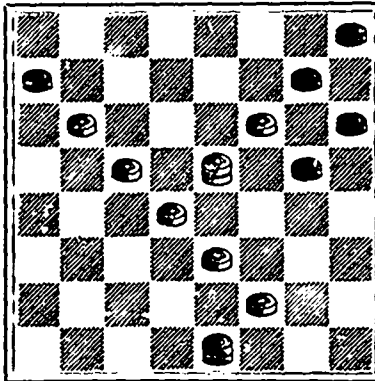
11-15	9-18	11-15	15-8
23 19	31 26	9 6	19 15
9-14	6-10	30-26	3-8
22 17	26 23	6 2	24 19
6-9	10-14	26-23	6-2
17 13	13 9	10 6	15 10
2-6	11-15	1-10	8-11
25 22	23 19	2 7	10 7
8-11	8-11	23-19	2-6
29 25	19 10	7 14	7 3
4-8	18-22	19-16	6-10
26 23	25 18	24 20	3 8
14-18	14-23	16-11	11-15
23 14	27 18	14 10	19 16
10-26	5-23	15-19	12-19
19 10	21 17	32 27	8 11
7-14	23-26	19-24	
30 23	17 14	28 19	drawn.
14-18	26-30	11-15	
23 14	14 9	27 24	

Black thought to win here, but, not being equal to the occasion, the result was a draw.

PROBLEM 349.

By J. Spence.

Black mon 4, 5, 8, 12, 16, king 31.



White mon 9, 11, 14, 18, 23, 27, kg. 15. White to play and win. Silvers may find the stroke simple and pleasing, but to win after it will prove more difficult, we think.

TO CORRESPONDENTS

M. L., Clyde Bank.—Your letter received. Will probably answer from Toronto.

SOLUTION.

PROBLEM 347.—We have received no solutions to this problem as yet, and, as we regard it as a very fine one and well worthy the study of checkerists, we withhold the reply for the present. In the meanwhile we invite all who are interested in the game of draughts to consider it and to send us their conclusions. As the conditions of the game are open, viz: black to move. What result? Some answer is possible, and we shall be most pleased if our friends will show their interest by sending us their ways of working it out. Even if they prove faulty, the knowledge of the game and the experience that will be gained should amply repay the student of checkers.

THE CHAMPIONSHIP.

The match at Toronto between Messrs. Forsyth and Kelly (30 games, wins and draws to count,) for the checker championship of Canada and

a trophy presented by the Toronto Draughts Club was to commence on Monday last, and we presume that it did, but at this writing we are without direct information. We hope before going to press to receive despatches showing the opening and progress of the match. In future issues we purpose publishing some of the more interesting games that are played and of the situations reached.

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