APPLIED ELECTROCHEMISTRY AND WELDING: PART I-APPLIED ELECTROCHEMISTRY; PART II-WELDING

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649060191

Applied Electrochemistry and Welding: Part I- Applied Electrochemistry; Part II-Welding by Charles F. Burgess & George W. Cravens

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

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CHARLES F. BURGESS & GEORGE W. CRAVENS

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Trieste

APPLIED ELECTROCHEMISTRY AND WELDING

A PRACTICAL TREATISE ON COMMERCIAL CHEMISTRY, THE ELECTRIC FURNACE, THE MANUFACTURE OF OZONE AND NITROGEN BY HIGH-TENSION DISCHARGES, AND THE APPLICATIONS OF ELECTRIC, GAS, AND CHEMICAL WELDING TO MANUFACTURING AND REPAIR WORK

PART I—APPLIED ELECTROCHEMISTRY

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PART II—WELDING

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ILLUSTRATED

AMERICAN TECHNICAL SOCIETY
CHICAGO
1920

INTRODUCTION

THE principles of Electrochemistry are almost as old as the science of electricity itself. The phenomenon of electrolysis was discovered in 1800, and its laws were experimentally determined by Faraday in 1833; again the electrolytic cell, with its simple electrodes and conducting liquid, was very early used to accomplish the dissociation of chemical compounds in the same manner as it is now used in chemical industries; the electric furnace was really discovered almost simultaneously with the arc lamp and in its essentials is identical with it.

¶ The cheapening of electrical power and the increased use of the products involved have been largely responsible for the progress along these lines and, today, the preparation of electrolytic copper is a great industry; hydrogen and oxygen gases are now obtained by the electrolytic decomposition of water; and the method of electrolyzing fused aluminum oxide has brought the price of aluminum to a practical basis. Again, by means of the electric furnace, several highly resisting chemical reductions have been accomplished and methods have been perfected for the manufacture of calcium carbide, silicon products, carborundum, graphite, and steel.

¶ Welding, one is rather inclined to think, is an unimportant process applied exclusively to the repairing of broken down machinery, but one glance at this section in the volume shows what a commanding position the electric arc, butt, and spot welders are taking in the manufacturing world, and gives a clear idea of the applications of gas and thermit welding to all sorts of processes which are usually supposed to be purely machine operations.

¶ Finally, when by the aid of intense electrical discharges in air, even the nitrogen of the atmosphere is made available for our use, the results seem to approach the miraculous. To think of the world's supply of nitrates being augmented from the very atmosphere itself seems more like a dream of a Jules Verne or a Wells, than an actual twentieth century accomplishment.

¶ All of these scientific marvels are intensely interesting and the treatment has been made exceedingly practical by the authors. The material is written in a clear readable style and is designed to appeal to both the trained engineer and the layman. It is the hope of the publishers that a study of this volume may widen the acquaintance of many readers with this branch of industrial electricity and stimulate their interest in the general scientific development of the world.

TRACK WELDING MACHINE IN OPERATION

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