THE MANUFACTURE OF METALLIC ARTICLES ELECTROLYTICALLY. - ELECTRO-ENGRAVING

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W. PFANHAUSER

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Trieste

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Manufacture of Metallic Articles Electrolytically. — Electro-Engraving

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MONOGRAPHS

—ON—

APPLIED ELECTROCHEMISTRY

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PREFACE

While giving in the present small treatise a compilation of the published information in the field of the manufacture of metallic articles by electrolytic methods, I must say that it is impossible to treat such an extensive field in so small a space in such a manner that the technician, seeking for minute details, would not be compelled to seek further information in special publications.

The material can only be handled in the form of abstracts, but in many cases the incompleteness of the work is entirely due to the fact that it has been impossible to publish all the secrets of the trade. On these grounds I must unfortunately restrain myself in many cases from presenting such important data as to the profitableness of most of the processes; yet in many cases I have attempted to supply the lack of such data by my own calculations, where the firms using the processes were unwilling to furnish such data. In many cases profitableness of the processes may be deduced from the data concerning the process, which have been given.

Many of the processes meet with a great many unforseen difficulties, such as in the details of apparatus or of technical practicability; many on the contrary cost more than the old processes.

The thoughtful artisan, however, will find much food for reflection in many of the processes described, and be induced to experiment further in one or another direction, or to attempt to perfect some of these processes, and I will consider my task sufficiently completed if I have furnished the impulse to this work by my modest efforts.

VIENNA. W. PFANHAUSER.

I. HISTORICAL REVIEW.

INTRODUCTION.

M. H. Jakobi is generally acknowledged as the founder of galvanoplastic reproduction and the industrial development of copper precipitation resulting therefrom. He first presented the results of his pioneer work to the St. Petersburg Academy of Sciences in 1838. However, Jordan and Spencer contested the priority, but it has been proven that these brought their experiments to a practical stage later than Jakobi. Jakobi also, like all workers in galvanoplasty up until the last thirty years, worked with the well-known cell apparatus, which in principle was practically a short-circuited Daniell cell.

In the year 1840 Murray introduced the graphitizing of non-conducting surfaces and in 1842 reproduced the first engraved copper plates by galvanoplastic methods.

ADVANCES IN THE ART.

The manufacture of useful articles in the electrolytic way could naturally only become practicable with the advent of the modern dynamo machine which thus makes available large quantities of electrical energy. With the increased interest in all such processes which used electricity there was a great increase along experimental lines, towards the bringing of electricity to the service of the metal worker, and thus the circle of application rapidly widened.

As in almost all branches of electrochemistry, so here, detailed information of processes, such as is used by technicians for their exact reproduction, are seldom to be had, and I must, in many cases, limit myself to assumptions, especially where calculations are involved.

At the present time there are a large number of more or less technically available processes, widely divergent electrolytically, for the manufacture of useful articles, in which in general copper is used as the depositing metal; and it is only very recently that