

**ELECTRO-TYPING: A PRACTICAL MANUAL
FORMING A NEW AND SYSTEMATIC GUIDE
TO THE REPRODUCTION
AND MULTIPLICATION OF PRINTING
SURFACES AND WORKS OF ART BY THE
ELECTRO-DEPOSITION OF METALS**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649103713

Electro-typing: a practical manual forming a new and systematic guide to the reproduction and multiplication of printing surfaces and works of art by the electro-deposition of metals by J. W. Urquhart

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

J. W. URQUHART

**ELECTRO-TYPING: A PRACTICAL MANUAL
FORMING A NEW AND SYSTEMATIC GUIDE
TO THE REPRODUCTION
AND MULTIPLICATION OF PRINTING
SURFACES AND WORKS OF ART BY THE
ELECTRO-DEPOSITION OF METALS**

LIBRARY

UNIVERSITY OF
CALIFORNIA
IRVINEVER
7.05**WEALE'S SCIENTIFIC & TECHNICAL SERIES.****CIVIL ENGINEERING & SURVEYING.**

Civil Engineering. H. LAW & D. K. CLARK	6/6
Pioneer Engineering. E. DOBSON	4/6
Iron Bridges of Moderate Span. H. W. PENDRED.	2/-
Iron and Steel Bridges & Viaducts. F. CAMPIN	3/6
Constructional Steel & Ironwork. F. CAMPIN	3/6
Tubular & Girder Bridges. G. D. DEMPSEY	2/-
Materials and Construction. F. CAMPIN	3/-
Sanitary Work. C. SLAGG	3/-
Roads & Streets. LAW, CLARK, & WALLIS-TAYLER	6/-
Construction of Gasworks. S. HUGHES & H. O'CONNOR	6/-
Well-Sinking. J. G. SWINDELL & G. R. BURNELL	2/-
Drainage. G. D. DEMPSEY & D. K. CLARK	4/6
Blasting and Quarrying. J. BURGOYNE	1/6
Foundations and Concrete Work. E. DOBSON	1/6
Pneumatics. C. TOMLINSON	1/6
Surveying. T. BAKER & F. E. DIXON	2/-

MECHANICAL ENGINEERING, &c.

Engineering Drawing. J. MAXTON	3/6
Fuels, Analysis and Valuation. H. J. PHILLIPS	2/-
Fuel. C. W. WILLIAMS & D. K. CLARK	3/6
Boilermaker's Assistant. J. COURTNEY	2/-
Boilermaker's Ready Reckoner. J. COURTNEY	4/-
Boilermaker's Ready Reckoner and Assistant	7/-
Steam and Machinery Management. M. P. BALE.	2/6
Steam and the Steam Engine. D. K. CLARK	3/6
Steam Engine, Theory of. T. BAKER	1/6
Steam Engine. DR. LARDNER	1/6
Locomotive Engines. G. D. DEMPSEY & D. K. CLARK	3/-
Locomotive Engine Driving. M. REYNOLDS	3/6
Stationary Engine Driving. M. REYNOLDS	3/6
Model Locomotive Engineer. M. REYNOLDS	3/6
Modern Workshop Practice. J. G. WINTON	3/6
Mechanical Engineering. F. CAMPIN	2/6
Details of Machinery. F. CAMPIN	3/-

CROSBY LOCKWOOD & SON, 7, Stationers' Hall Court, E.C.

Z
252
U79

WEALE'S SCIENTIFIC & TECHNICAL SERIES.

MECHANICAL ENGINEERING, &c.—contd.

Elementary Marine Engineering. J. S. BREWER	1/6
Power of Water. J. GLYNN	2/-
Mechanism and Machines. T. BAKER & J. NASMYTH	2/6
Mechanics. C. TOMLINSON	1/6
Cranes and Machinery. J. GLYNN	1/6
Smithy and Forge. W. J. E. CRANE	2/6
Sheet-Metal Worker's Guide. W. J. E. CRANE	1/6
Elementary Electric Lighting. A. A. C. SWINTON	1/6

MINING & METALLURGY.

Mining Calculations. T. A. O'DONAHUE	3/6
Mineralogy. A. RAMSAY	3/6
Coal Mining. Sir W. W. SMYTH & T. F. BROWN	3/6
Mineral Surveyor's Guide. W. LINTERN	3/6
Slate and Slate Quarrying. D. C. DAVIES	3/-
Mining and Quarrying. J. H. COLLINS	1/6
Subterraneous Surveying. T. FENWICK & T. BAKER	2/6
Mining Tools. W. MORGAN	2/6
Plates to ditto. 4to	4/6
Physical Geology. PORTLOCK & TATE	2/-
Historical Geology. R. TATE	2/6
The above 2 vols., bound together	4/6
Electro-Metallurgy. A. WATT	3/6

NAVIGATION, SHIPBUILDING, &c.

Navigation. J. GREENWOOD & W. H. ROSSER	2/6
Practical Navigation. GREENWOOD, ROSSER & LAW	7/-
Navigation and Nautical Astronomy. J. R. YOUNG	2/6
Mathematical & Nautical Tables. LAW & YOUNG	4/-
Masting and Rigging. R. KIPPING	2/-
Sails and Sailmaking. R. KIPPING	2/6
Marine Engines. R. MURRAY & G. CARLISLE	4/6
Naval Architecture. J. PRAKE	3/6
Ships, Construction of. H. A. SOMMERFELDT	1/6
Plates to ditto. 4to	7/6
Ships and Boats. W. BLAND	1/6

CROSBY LOCKWOOD & SON, 7, Stationers' Hall Court, E.C.

WEALE'S SCIENTIFIC & TECHNICAL SERIES.

AGRICULTURE & GARDENING.

Fertilisers & Feeding Stuff.	DR. B. DYER	net	1/-
Draining and Embanking.	PROF. J. SCOTT		1/6
Irrigation and Water Supply.	PROF. J. SCOTT		1/6
Farm Roads, Fences, and Gates.	PROF. J. SCOTT		1/6
Farm Buildings.	PROF. J. SCOTT		2/-
Barn Implements and Machines.	PROF. J. SCOTT		2/-
Field Implements and Machines.	PROF. J. SCOTT		2/-
Agricultural Surveying.	PROF. J. SCOTT		1/6
The above 7 vols., bound together			12/-
Farm Management.	R. S. BURN		2/6
Landed Estates Management.	R. S. BURN		2/6
Farming—Soils, Manures, and Crops.	R. S. BURN		2/-
Farming—Outlines—Farming Economy.	R. S. BURN		3/-
Farming—Cattle, Sheep, and Horses.	R. S. BURN		2/6
Farming—Dairy, Pigs, and Poultry.	R. S. BURN		2/-
Farming—Sewage & Irrigation.	R. S. BURN		2/6
The above 5 vols., bound together			12/-
Book-keeping for Farmers.	J. M. WOODMAN		2/6
Ready Reckoner for Land.	A. ARMAN		2/-
Miller's & Farmer's Ready Reckoner			2/-
Hay and Straw Measurer.	J. STEELE		2/-
Meat Production.	J. EWART		2/6
Mulm-in-Parvo Gardening.	S. WOOD		1/-
Forcing Garden.	S. WOOD		3/6
Market and Kitchen Gardening.	C. W. SHAW		3/6
Kitchen Gardening.	G. M. F. GLENNY		1/6
Cottage Gardening.	E. HOBDAV		1/6
Garden Receipts.	C. W. QUIN		1/6
Culture of Fruit Trees.	M. DU BREUIL		3/6
Tree Planter & Plant Propagator.	S. WOOD		2/-
Tree Pruner.	S. WOOD		1/6
Tree Planter, Propagator, & Pruner.	S. WOOD		3/6
Grafting and Budding.	C. BALLET		2/6
Bees for Pleasure & Profit.	G. G. SAMSON	net	1/-

Huffstutler
3-13110

ELECTRO - TYPING

A PRACTICAL MANUAL

FORMING

A NEW AND SYSTEMATIC GUIDE TO THE REPRODUCTION
AND MULTIPLICATION OF PRINTING SURFACES
AND WORKS OF ART BY THE ELECTRO-
DEPOSITION OF METALS

BY

^{John}
J. W. URQUHART, C.E.

AUTHOR OF "ELECTRO-PLATING, A PRACTICAL HANDBOOK," "ELECTRIC LIGHT,
ITS PRODUCTION AND USE," &c.



LONDON

CROSBY LOCKWOOD AND CO.

7, STATIONERS' HALL COURT, LUDGATE HILL

1881

[All rights reserved]

PRINTED BY
WILLIAM CLOWES AND SONS, LIMITED
LONDON AND BECCLES.

PREFACE.

THE author's endeavour to treat, in an easily apprehended style, upon another branch of the Electro-metallurgic art ("Electro-Plating"), has received so much encouragement that he has been induced to offer the present handbook as a companion volume, in the belief that it will meet a want of considerable extent.

The distinct art of electro-typing has, within the last few years, advanced with such wonderful rapidity that it is now practised as an important auxiliary in industries of the most varied description. The particular methods employed in the processes ten years ago may now be considered in great part obsolete, improved systems having superseded them. This small treatise is therefore intended to serve as a guide, not only to beginners in the art, but to those who still practise the old and imperfect methods of electro-typing; it aims also at preparing the way for a thorough scientific study of the art, if such be considered necessary for its successful prosecution.

The introduction of cheaper electrical generators, in the form of dynamo-electric machines, driven by steam-power, has brought about many of the changes above alluded to. The Americans have exhibited great enterprise of late years in cheapening every detail of the process, which English electrotypers have not been slow to appreciate, adding to both speed of working and excellence of the products; but on the Continent, especially in Germany, the art is as yet in a backward state.

In the following pages special prominence has been given to the production of printing electrotypes, and to the reproduction of art work. An endeavour has been made to grasp the fundamental principles of the art; an earnest attempt has been made to induce the reader to take some interest in the scientific basis of the processes, by giving practical examples of the use he can make of the oft-misunderstood and generally confusing laws of electro-chemical science.

The first chapter of the book is in great part occupied by explanations of the leading electrical laws, and their relation to the chemical compounds to be subjected to electrolysis. An endeavour has been made to reduce the terms, "current of electricity," "amount of deposit," and so forth, to some real and easily apprehended meaning, in order that the reader may be able to attach practical significance to the current he is using, and reconcile its amount with the weight of copper he can obtain. Some little acquaintance with chemistry