

I. C. S. REFERENCE LIBRARY

A SERIES OF TEXTBOOKS PREPARED FOR THE STUDENTS OF THE
INTERNATIONAL CORRESPONDENCE SCHOOLS AND CONTAINING
IN PERMANENT FORM THE INSTRUCTION PAPERS,
EXAMINATION QUESTIONS, AND KEYS USED
IN THEIR VARIOUS COURSES

ELECTRIC RAILWAYS
INTERIOR WIRING

4-16445

SCRANTON
INTERNATIONAL TEXTBOOK COMPANY

Copyright, 1901, 1904, by INTERNATIONAL TEXTBOOK COMPANY.

Entered at Stationers' Hall, London.

Electric Railways, Parts 1, 2, 3, and 4: Copyright, 1901, by INTERNATIONAL TEXTBOOK COMPANY. Entered at Stationers' Hall, London.

Electric Railways, Part 5: Copyright, 1900, 1901, by THE COLLIERY ENGINEER COMPANY. Copyright, 1901, by INTERNATIONAL TEXTBOOK COMPANY. Entered at Stationers' Hall, London.

Electric Railways, Part 6: Copyright, 1899, 1901, by THE COLLIERY ENGINEER COMPANY. Copyright, 1901, by INTERNATIONAL TEXTBOOK COMPANY. Entered at Stationers' Hall, London.

Interior Wiring: Copyright, 1901, by INTERNATIONAL TEXTBOOK COMPANY. Entered at Stationers' Hall, London.

All rights reserved.

PRINTED IN THE UNITED STATES

BURR PRINTING HOUSE
FRANKFORT AND JACOB STREETS
NEW YORK



CONTENTS

ELECTRIC RAILWAYS	<i>Section</i>	<i>Page</i>
Methods of Supplying Current	20	1
The Power House	20	12
Station Equipment	20	21
Electrical Equipment of Station	20	27
Railway Switchboards	20	44
Railway Switchboard Appliances	20	48
Cost of Power	20	63
Special Electrical Appliances	21	11
Use of Boosters	21	13
Storage Batteries in Connection With		
Electric Railways	21	26
Power Estimates	21	36
Overhead Line Construction	21	44
Feeders	21	47
Trolley Wire	21	51
Methods of Arranging Trolley Wire	21	53
Line Fittings and Line Erection	22	1
Line and Track Calculations	22	16
The Track	22	36
The Roadbed	22	39
Rails	22	40
Examples of Street-Railway Track Con-		
struction	22	51
Calculation of Feeders	23	1
Electrolysis	23	25
Line Tests	23	31
Auxiliary Equipment	23	35

<i>ELECTRIC RAILWAYS—Continued</i>	<i>Section</i>	<i>Page</i>
The Car House	23	35
The Repair Shop	23	39
Motor Cars and Their Equipment	24	1
Car Bodies	24	1
Trucks	24	3
Electrical Equipment	24	9
Methods of Control	24	11
Rheostatic Control	24	11
Rheostatic Controller	24	18
Series-Parallel Control	24	28
K2 Series-Parallel Controller	24	29
K11 Series-Parallel Controller	24	42
K10 Controller	24	45
Westinghouse 28A Controller	24	45
Four-Motor Equipments	24	54
Street-Railway Motors	24	58
General Electric Motors	24	62
Westinghouse No. 56 Motor	24	69
Railway-Motor Armature Connections	24	73
Railway-Motor Field Connections	24	80
Car Appliances	25	1
Trolley Pole and Fittings	25	2
Trolley Stands	25	6
Canopy Switches	25	9
Fuse Boxes	25	13
Circuit-Breakers	25	18
Street-Car Lightning Arresters	25	20
Resistance Coils	25	23
Electric Car Heating	25	26
Examples of Electric Heaters	25	27
Car Lighting	25	34
Brakes	25	42
Double-Truck Hand-Brakes	25	49
Air Brakes	25	51
The Electric Brake	25	67
Westinghouse Electric Brake	25	76
The Multiple-Unit System	25	77

CONTENTS

v

INTERIOR WIRING	<i>Section</i>	<i>Page</i>
Preliminary Consideration	26	1
Fires Caused by Electric Wiring	26	2
The National Electric Code	26	2
Examples of Electrical Fires	26	4
Electric Lamps	26	10
General Rules	26	18
Wiring for Low-Potential Systems	26	24
Systems of Distribution for Interior Wiring	26	27
Switches and Cut-Outs	26	34
Open Work in Dry Places	26	40
Wiring for a Uniform Drop	26	56
Calculation of Line Losses Due to Resist- ance	26	59
Calculation of the Proper Size of Wire for a Given Loss	26	62
Effect of Connecting Low-Voltage Cur- rent and Lamps to Wiring Calculated for High Voltage	26	66
Uniform Drop in Feeder Lines	27	1
Calculation of Wires in Terms of Circular Mils	27	5
Forms of Wiring Tables	27	9
Fuse Protection for Conductors in Mul- tiple	27	14
Wiring in Damp Places	27	18
Concealed Knob-and-Tube Work	27	21
Wiring a Dwelling House	27	30
Fixtures	27	44
Location and Distribution of Lamps	27	47
Conduit Wiring	27	49
Wooden Moldings	27	63
Tests	27	65
Marine Work	27	68
Wiring Estimates	27	72
Combining Several Wiring Systems	28	1
Theater Wiring	28	4

<i>INTERIOR WIRING—Continued</i>	<i>Section</i>	<i>Page</i>
Wiring for Special Purposes	28	6
High-Potential Systems	28	11
Wiring for Arc Lamps	28	14
Wiring for Electric Motors	28	21
Bell Wiring	28	24
Burglar Alarms	28	40
Electric Gas Lighting	28	43