Contents

List of Tables and Figures	ix
Preface	
Acknowledgments	xix
Credits	
About the Author	
CHAPTER 1 Introduction	1
CHAPTER 2 The Early Discoveries	7
The Discovery of Chromium (1797)	8
Michael Faraday Pioneers the Alloying of Steel (1820)	
Iron-Chromium Alloys and the Production of	
Ferrochromium (1821)	10
Woods and Clark Describe an Acid- and Weather-Resistant	
Alloy (1872)	11
Discoveries in the 1890s	11
The Discovery of Martensitic and Ferritic Chromium	
Stainless Steels (1904)	12
The Discovery of the Chromium-Nickel Austenitic	
Stainless Steels (1906)	13
The Discovery of Corrosion Resistance (1908)	
Another Important Ferritic Chromium Stainless Steel	
Is Discovered (1911)	14
CHAPTER 3 Discoveries of the Commercial Usefulness of Stainless Steel	17
Usefulness of a Martensitic Chromium Stainless Steel	
Discovered in England and America (1911–1912)	17

Usefulness of Ferritic Chromium Stainless Steels Discovered in	
America (1911–1914)	21
Usefulness of Chromium-Nickel Stainless Steels Discovered in Germany (1912)	22
Usefulness of Chromium-Silicon Steels	22 23
Oserumess of Chromium-Sincon Steels	43
CHAPTER 4 The Great Stainless Steel Symposium (1924)	25
Data on Stainless Steels Presented	
History and Patents	
An Iron-Chromium-Nickel Alloy	
Continuing Role of ASTM	30
CHAPTER 5 The Life of Harry Brearley (1871–1948)	33
The Early Years	
Brearley Becomes Manager of Firth Brown Research	55
Laboratories	40
The Firth-Brearley Stainless Steel Syndicate	
The American Stainless Steel Company (1918–1936)	
Brearley's Later Years	
CHAPTER 6 The Early Books and Papers on Stainless Steel (1917–1949)	59
Paper by Dr. W.H. Hatfield (1917)	59
Paper on Stellite and Stainless Steel by Elwood Haynes (1920)	
Stainless Steel Paper by Marble (1920)	
Firth-Sterling Steel Company Trade Publication (1923)	
Paper on Cutlery Stainless Steel by Owen K. Parmiter (1924)	66
Stainless Iron and Steel by John Henry Gill Monypenny (1926)	
The Book of Stainless Steels (1933 and 1935)	
Stainless Steels by Carl Andrew Zapffe (1949)	
Appendix: Text of 1920 Paper by W.H. Marble	
CHAPTER 7 The Chrysler Building (1930)	. 101
i ne rirei Skverranere	103
The First Skyscrapers Nirosta (18-8) Stainless Steel	
Nirosta (18-8) Stainless Steel	105
Nirosta (18-8) Stainless Steel	105 108
Nirosta (18-8) Stainless Steel	105 108 115

CHAPTER 8 Edward G. Budd (1870–1946), Inventor	
and Entrepreneur12	2 3
The Early Years1	23
The Automobile Body Business	
A New Kind of Stainless Steel Arrives in America	
Earl Ragsdale's Shot Weld Patent	
The World's First Stainless Steel Airplane—The Pioneer	31
The World's First Stainless Steel Rubber-Tired Train	
The Burlington Zephyr1	
The Flying Yankee	
The Mark Twain Zephyr	
Transit and Trucking	
The War Years1	
The Postwar Years10	
A Review of the Budd Era	66
CHAPTER 9 The Gateway Arch 17	71
CHAPTER 10 History of Stainless Steel Melting and Refining 17	75
The Wild Process1	76
The Rustless Process	
The Linde Argon-Oxygen Decarburization (AOD) Process	78
CHAPTER 11 Two New Classes of Stainless Steel 18	85
Duplex Stainless Steel	85
Precipitation-Hardening Steel	
CHAPTER 12 Stainless Steel Applications 19	93
Household Products	
Food Handling	
Architecture	
Aircraft 0	
Automobiles	
Trains	
CHAPTER 13 Canada Restores a Fleet of Stainless Steel Railcars	29
CHAPTER 14 The Plummer Classification System of Trade Names	
	, i

CHAPTER 15 The Unified Numbering System (UNS) for Metals and Alloys	235
The Stainless Steel Numbering System	239
CHAPTER 16 The Naming and Numbering of Stainless Steels	241
Early Classes of Stainless Steel	242
Stainless Steel Trade Names	
Standardization	244
Appendix 1 Stainless Steel Bibliography	251
Appendix 2 A Stainless Steel Timeline	257
Index	335