

# The History of Stainless Steel

Harold M. Cobb



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*The History of Stainless Steel*  
is dedicated to my dear wife  
Joan Inman Cobb

## Front Cover

The Chrysler Building, erected in New York City in 1930, was once the tallest building in the world, being almost twice as high as the Washington Monument. It is widely acclaimed as the finest skyscraper, with its art deco style and the ornate tower that is clad with stainless steel.

The Chrysler Building was the first major use of stainless steel in architecture. The Nirosa chromium-nickel alloy had first been introduced in America just three years earlier, and the long-term endurance of the metal in the atmosphere was unknown. The building has become an icon of the stainless steel industry, a symbol of endurance and beauty, and a favorite of architects.

The photograph was taken by Ms. Catherine M. Houska, TMR Stainless, Pittsburgh, Pennsylvania, for the Nickel Development Association, Toronto, Ontario, Canada.

## Inside Front Cover

1934 photograph of the Burlington Zephyr at the E.G. Budd Manufacturing Company in Philadelphia, Pennsylvania. Courtesy of the Hagley Museum

## Inside Back Cover

List of stainless steels given in Carl Zapffe's 1949 book, *Stainless Steels*.

## Back Cover

**Top.** At a height of 630 feet, the Gateway Arch in St. Louis, Missouri, is the world's tallest monument, which surpassed the 555 foot height of the Washington Monument. With an exterior of stainless steel, the shape of the arch is that of an inverted catenary (or the shape of a chain dangling from two points at the same level). Courtesy of the Jefferson National Expansion Memorial National Park Service, St. Louis, Missouri.

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# Preface

What is stainless steel? The average person has no inkling, but it is all around us, and readers will be surprised to learn some of the stories of this remarkable material that one prominent metallurgist called “the miracle metal.”

Every day, most of us use stainless steel tableware and wear a wrist-watch with a stainless steel case and band. There are stainless steel racks in refrigerators and ovens, and there are stainless steel toasters, tea kettles, and even kitchen sinks. Cars have stainless steel exhaust systems that last for ten years instead of three when they were made of ordinary steel.

The amazing story is told of Harry Brearley, who rose from poverty, became a self-taught metallurgist, was one of the early discoverers of stainless steel, and received the Bessemer Gold Medal.

In the early days of stainless steel, the metal was often used when the goal was to produce the finest, the most durable, and the most beautiful product that money could buy. The Rolls-Royce Motor Car Company, for example, was one of the first to use stainless steel on an automobile. Their 1929 car displayed the most striking radiator grille imaginable in silvery stainless steel.

In America in 1930, the office building of automaker Walter P. Chrysler opened in New York City. The Chrysler Building was the tallest and most ornate skyscraper in the world. The top 100 feet of the tower was clad in Nirosta stainless steel, making it the most beautiful and most visible building on the New York City skyline.

In 1934, a Philadelphia autobody company tried their hand at building a stainless steel train for the Chicago, Burlington, & Quincy Railroad. It was a streamlined, lightweight, luxurious, silvery train that

became the world's fastest. It traveled 3.2 million miles in 25 years and is now on display at the Chicago Museum of Science and Industry.

Eero Saarinen designed the St. Louis Gateway Arch, which was completed in 1965. The 630 foot, stainless-clad arch is the tallest monument. Saarinen wanted the arch to last for a thousand years.

Stainless steel was an expensive material, costing as much as 15 times that of ordinary steel. The story is told of how one young metallurgist in 1970 discovered, in the laboratory, a process that would cut the cost of stainless steel in half and produce better steel. The other part of the story was that it took 12 years to discover how to develop the process for large-scale production.

How it was possible for things like these to happen and the story of how stainless steels were discovered are explained in this first history of stainless steel. Stainless steels have become the third most widely used metals, following aluminum and steel.

Harold M. Cobb  
Kennett Square, Pennsylvania  
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