

Grand Central Terminal

BY LUKE T. BAKER

IN THE HEART of New York City stands a Beaux-Arts jewel box, a marble structure supported by steel and containing within it brass, bronze, and gold, as well as precious art glass. Grand Central Terminal, celebrating its centennial this year, is a renowned architectural destination, and a twentieth-century cathedral to the modern deities of

transportation, technology, speed, and innovation. Considering the metals that make up the terminal casts light on its construction and history. Built in 1913, Grand Central continues to captivate and remains a landmark that straddles historicism and modernism.

Picture yourself in the center of the vaulted concourse, 125 feet below the canopy of a celestial ceiling mural, light streaming in through 60-foot windows, bustling throngs of commuters and tourists all around you. You are in metal's house—metal built this place, literally and figuratively. From structural steel to sumptuous gilding, this

Beaux-Arts palace owes a great debt to the metal materials and metalworkers that shaped our modern world.

Grand Central's existence is predicated on that triumphant vehicle of nineteenth-century progress, the locomotive, or Iron Horse as it was popularly known. Cornelius "Commodore" Vanderbilt, founder of one of the most illustrious American dynasties, made his fortune as a railroad tycoon in the early days of that industry. He built the Grand Central Depot in 1871 on the present-day site, a masonry building with a train shed constructed in the new architectural idiom of industrially produced plate glass and forged iron, a bold look already used for the Gare du Nord in Paris and St. Pancras Station in London. The depot's cavernous train garage measured 630 by 200 feet and was 90 feet tall. Such a massive parabolic span could only be built with metal supports. In this case, thirty-one iron trusses, 4 feet

wide and 1 foot thick, were required to bear the weight of the arch. Trains ran on street-level tracks along Fourth Avenue north of the depot. As rail traffic increased and train-related accidents and pollution menaced the city's population, it was clear that the depot's railyard, which had grown to 23 acres encompassing seventeen tracks, was out of place in the center of what had subsequently become Midtown Manhattan.

By 1903, a plan for a new terminal was in motion. William Wilgus, chief engineer of the New York Central railroad, proposed an elegant and ingenious solution for the terminal: bury the train tracks underground in tunnels, thereby returning the street to pedestrians, carriages, and cars, and freeing up railyard real estate for future development (birthing the concept of "air rights"). The design for the new terminal building was awarded initially to experienced railroad architects Reed and Stem, who developed the primary circulation plan, but a firm of Vanderbilt cronies, Warren and Wetmore, took over the project and were responsible for

The four-sided ball clock atop the Information Booth in the Main Concourse



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much of the interior and exterior design of this significant civic commission.

The demolition of the original buildings began in 1910. An elaborate wheeled scaffolding unit that arched over the tracks was devised to gradually dismantle the old train shed from the northernmost end to the base, abutting the terminal. At night, work trains would shuttle away debris, totaling 1,350 tons of wrought iron, 350 tons of cast iron, and 90,000 square feet of corrugated iron—almost the weight of 3 fully loaded, double-decker Boeing 747s—all without disrupting regular passenger rail service. By 1911, construction on the underground tracks and head house (the public terminal area) was underway. Below grade, supporting columns and steel girders were installed to form stacked tunnels, the bottommost of which had to be engineered to support the weight of loaded trains above, in addition to the buildings that would eventually be built on the surface. In the terminal building, structural support in the form of riveted and pinned steel was clad with terracotta for fireproofing and concealed beneath a skin of Botticino marble. The use of copper for the building's roof was not only consistent with its Beaux-Arts scheme but also a practical consideration since copper is lightweight, corrosion resistant, and doesn't transmit heat between exterior and interior. In 1913, the new terminal opened to the public, serving an all-electric fleet of trains.

By constructing a classical building dedicated to a thoroughly modern form of transport, all in the middle of a rapidly growing city, Reed and Stem, and Warren and Wetmore's Grand Central Terminal artfully blended the timeless with the novel.

At the time Grand Central Terminal was built, long distance train travel was the epitome of luxury and a privilege only wealthy Americans could afford. Shiny engines, intercity routes with glitzy names, and five-star dining (among other onboard amenities), all contributed to the glamour of train travel around the turn of the century. A new terminal like Grand



Illustration of train shed interior at Grand Central Depot, New York City, 1877

Grand Central Terminal, nearing completion, early 1913



Grand Central Terminal's upper level Main Concourse, traversed by 750,000 people daily

METAL DETECTOR

Central was designed, inside and out, to reinforce these notions, and its sumptuous decoration—particularly the elaborate metalwork—evoked palatial splendor for travelers and gawkers alike.

One of the best-known New York City meeting places is the metal and glass Information Booth in the middle of Grand Central's Main Concourse. The feature that makes the booth (and your departing train) impossible to miss is the spherical, illuminated clock topping it like an oversized finial. This cast-brass clock was manufactured by the Seth Thomas Clock Company of Waterbury, Connecticut, a town known for its watchmakers and whose numerous brass

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foundries earned it the sobriquet Brass City. Each of the four clock faces is constructed from a solid piece of opalescent glass (though rumors persist that the clockmakers used actual opal gemstones valued in the millions). There can never be too many clocks in an edifice built around the regularity of railroad timetables, and another outsize clock by Tiffany and Co., adorns the south façade of the terminal overlooking Park Avenue. Flanked by a sculpture group of Minerva, Mercury, and Hercules (allegories representing the concept of transportation), the 14-foot clock face, with its 340-pound metal hands, is the largest example of Tiffany stained glass in existence.

Equally impressive in 2013 are the massive chandeliers hanging in the Main Concourse and in the Waiting Room, manufactured by the Sterling Bronze Company. These fixtures were made partially of gold-plated nickel and, like other metalwork throughout the terminal, they bear the oak leaf and acorn device adopted as an ersatz heraldic motif by the Vanderbilt family. Each of the five oblong chandeliers bracketing the Main Concourse is nearly 20 feet tall, weighs over 800 pounds, and is studded with 110 light bulbs. The larger, tiered chandeliers in Vanderbilt Hall each weigh 2,500 pounds and are illuminated by 132 bulbs. All of the original bulbs were bare, exposing the wonder of their electrically charged filaments for all to see; such an auspicious celebration of electric light was fitting for a twentieth-century terminal like Grand Central, which was built around the time electric power was overtaking steam.

Sparing no expense, the building's designers even incorporated precious metals into the vaulted Concourse ceiling. The zodiac scene arcing over the Grand Concourse was painted in 1913 by French artist Paul-César Helleu, who was best known for his Belle Epoque portraits. Each of the mythical celestial figures and key stars were embellished with gold leaf (that go-to illuminator of years past) and, since 2008, by modern LED bulbs. After a thorough surface cleaning in 1998, John Canning and

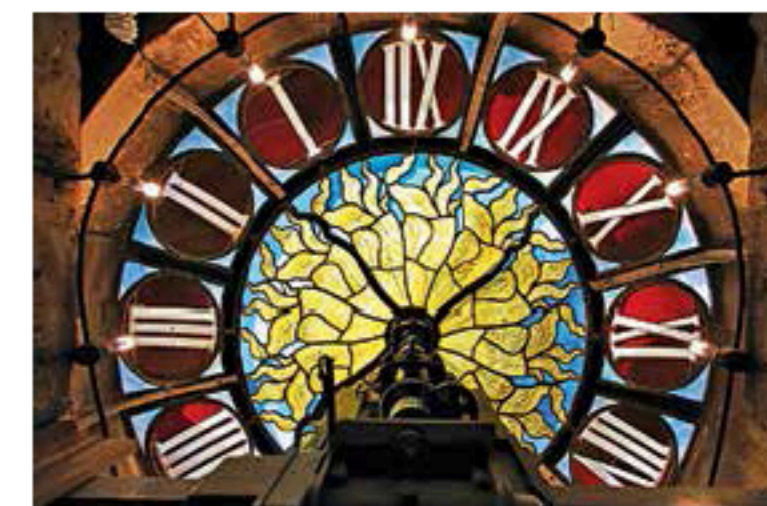
Company, a Connecticut firm specializing in the restoration of historic buildings and artworks, regilded some 2,500 gold stars in 23-karat gold leaf.

An extensive 196-million dollar renovation project was undertaken in 1994 to restore the terminal's faded glory. Several firms were contracted to re-create the bronze grills, luggage rails, and lamps for twenty-eight ticket windows that had been, according to lore, melted down during World War II to support the war effort. Brooklyn-based Excalibur Bronze relied on historical photos to cast silicon brass replacements for the original 250-pound window grills. The grand chandeliers were removed and shipped to Utah for restoration by Historic Arts and Castings, where they were cleaned, repaired, and replated. The same company also reproduced other bronze elements throughout the terminal, including lamps, handrails, and components of the Information Booth. Even the terminal's patinated copper roof was replaced with 40 tons of quarter-hard, 20-ounce copper from the New York Roofing Company in Queens.

Metalwork at Grand Central Terminal tells the story of America at its industrial zenith. The same Pennsylvania steel that holds aloft this great structure was also being forged into railroad tracks that linked both sides of the continent, to facilitate travel and trade, and being used in the building of the modern skyscraper. The imported Beaux-Arts style that yielded a trove of regal decorative motifs for an ascendant elite of American nouveaux riches (like the Vanderbilts) also brought a classicized rationality to the country's new civic architecture and to plans for its growing cities. At 100 years old, Grand Central Terminal still functions as a gilded gateway to the modern metropolis, raised up from the ground and richly appointed within by a corps of metalworkers using native materials, a triumph of American ingenuity, industriousness, and optimism.

Luke T. Baker has written about visual and material culture for the Museum of Modern Art, Art Papers, Modern and The Studio Potter among other publications.

Furthermore:
www.grandcentralterminal.com



Statuary clock high atop Grand Central Terminal, with Mercury, Hercules, and Minerva

The 13-foot diameter Tiffany glass statutory clock, viewed from inside the clock tower

"Melon" chandeliers, suspended over the ramps leading to the lower level

