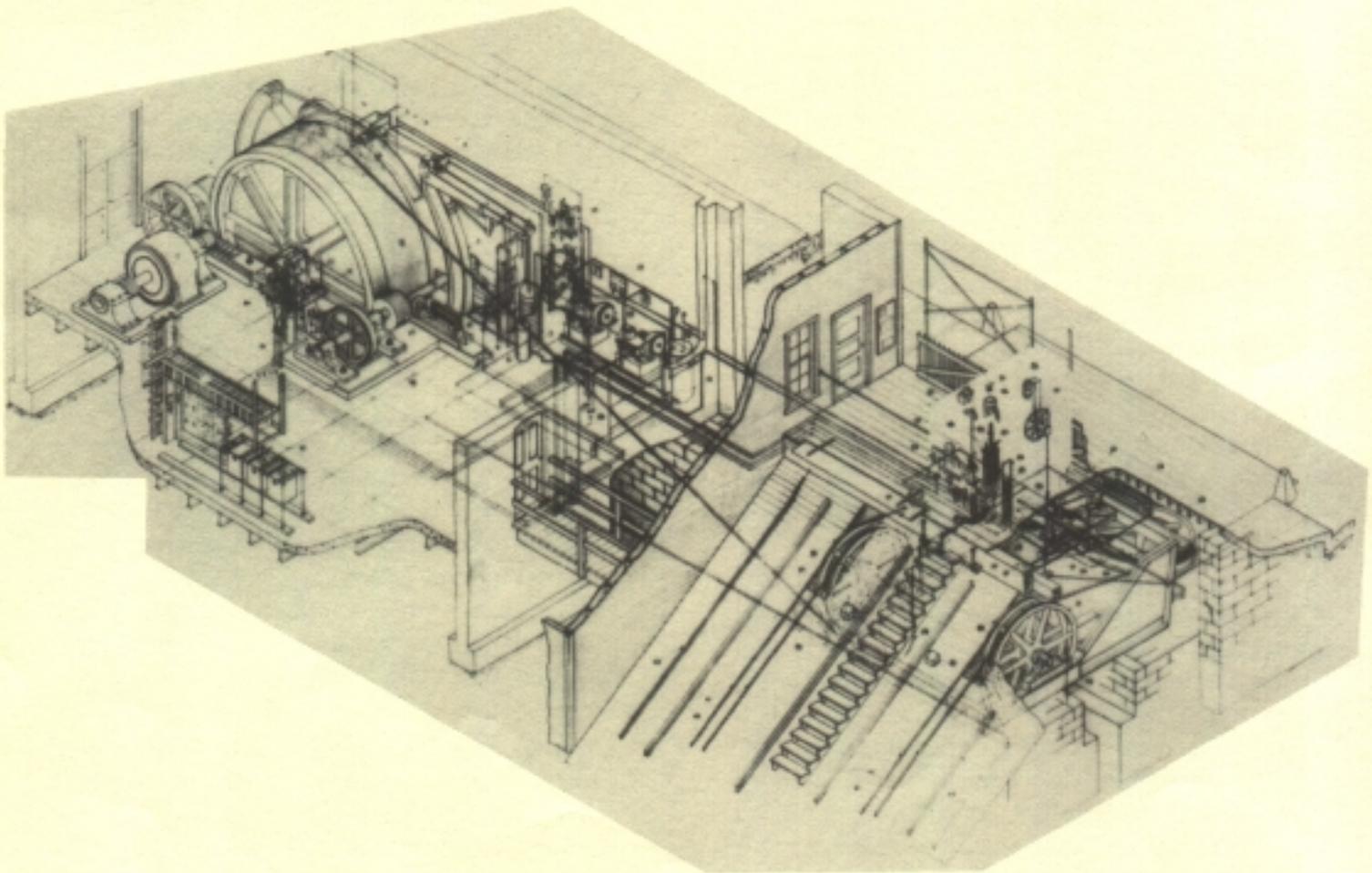


# ***THE JOHNSTOWN INCLINE***

*Johnstown, Pennsylvania*



**REGIONAL  
HISTORIC  
MECHANICAL ENGINEERING  
LANDMARK**



The American Society of  
Mechanical Engineers

# HISTORICAL SIGNIFICANCE OF THE JOHNSTOWN INCLINE

Johnstown, Pennsylvania has become known for many things, among them a reputation for its devastating floods. The largest flood in Johnstown's history occurred on May 31, 1889, when some 2,209 people lost their lives. Although the destruction was great, the people of Johnstown began to rebuild their lives and community.

The Cambria Iron Company, then the largest land owner in the county, began developing a hill-top community on Yoder Hill. The grade between Johnstown and the new community, eventually named Westmont, was over seventy percent, too steep for horses and wagons. In order to make the development accessible to Johnstown, the Cambria Iron Company began construction of an inclined railway in 1890. Many of the parts of the Incline were manufactured in Johnstown by the Cambria Iron Company, a predecessor of Bethlehem Steel Corporation, since railroad rails were one of the company's main products at the time. Due to the unique design of the Incline, many of the tools for construction and maintenance were hand-crafted at a blacksmith shop on the work site. They are still used today.

On June 1, 1891, the Johnstown Incline opened for business. It provided convenient transportation up Yoder Hill, connecting the valley floor to the new residential development of Westmont Borough. The move to higher land was encouraged and grasped with enthusiasm, especially with the trepidation of the Great Flood still fresh in the memories of survivors of the disaster. The construction of the Incline made this move possible. Almost 600 acres of land were developed for residential building in the new community of Westmont, which became one of the nation's earliest residential suburbs. Its population grew from 30 in 1890 to almost 500 only two years later.

On March 31, 1936, the flood waters again ran through Johnstown. The Incline proved its worth to the community, carrying almost 4,000 men, women, and children to safety. Flood waters hit Johnstown again on July 20, 1977. The Incline

carried people up to safety, as well as boats, emergency personnel, and equipment down to the valley to aid in rescue operations.

Originally, the Cambria Iron Company incorporated the Cambria Inclined Plane Company to attend to the business of the Incline. In April 1935, Westmont Borough began operating the inclined plane, after purchasing it from the Cambria Inclined Plane Company for the price of one dollar. Following World War II, the use of the Incline declined after better roads had been built up Yoder Hill. In April 1961, it was closed by Westmont due to the financial burden and safety concerns over deteriorated equipment. Under public pressure against closing it, the operating responsibilities were transferred to the Cambria County Tourist Council under a lease agreement. After restoration of the inclined plane by many community volunteers, it was reopened in July 1962. Facing the possibility of closing again in the early 1980's, the ownership of the Johnstown Inclined Plane again changed hands. On March 8, 1983, the Cambria County Transit Authority became the Incline's third owner, purchasing it from Westmont Borough for the price of one dollar. This purchase allowed the transit authority to seek public funds and grants. Once funds were secured, the transit authority was able to repair the Incline as well as improve the hilltop station.

An attractive visitor center was built along with a scenic overlook offering a panoramic view of downtown Johnstown and the Conemaugh Valley below. Also located at the Incline site are a souvenir shop and dining facilities. Other improvements were made that allow tourists to view the driving drum and other mechanical equipment in operation. These improvements allow the Incline to continue to serve the community as well as the tourists.

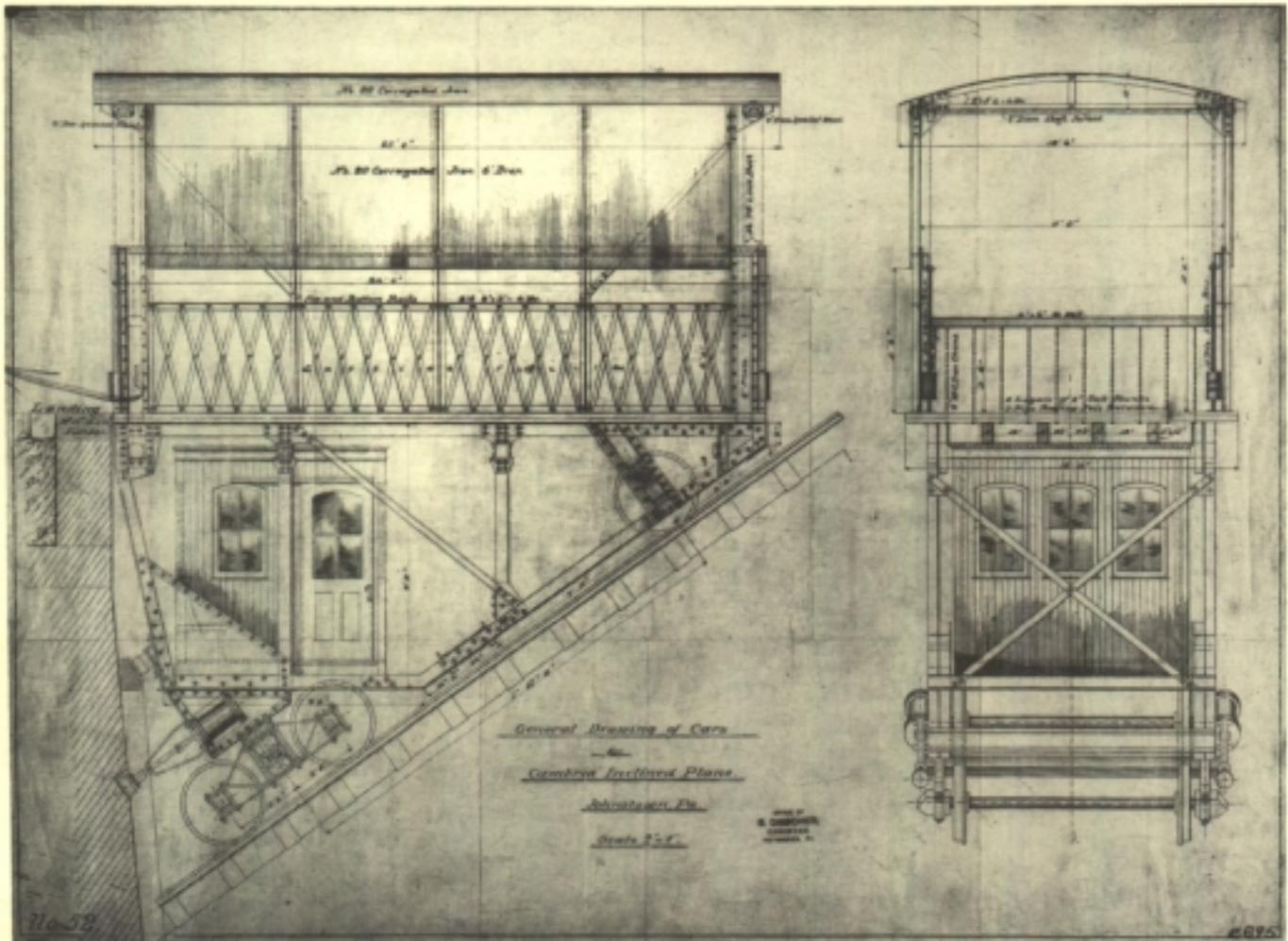
In its one-hundred-three years of operation, the Incline has carried over forty million passengers. Although it is now primarily a tourist attraction, it continues to transport workers between the city and Westmont Borough.

# DESCRIPTION OF THE LANDMARK

The 896.5 foot-long (273.3 m) Johnstown Incline rises 502.5 feet (153 m) on a continuous 71.97% grade, the steepest continuous grade of any incline. It was designed as a balanced incline with a double track and two cars. As one car goes up the incline the other car heads down, allowing the weight of the two cars to counterbalance each other and assist the motor in moving the cars. These cars were designed originally to provide passengers, as well as horse and carriage, a level ride. The horse and carriage would ride on the upper deck and the passengers would enter the bottom of the car from a door on the lower floor of each station. Upon renovation in 1921, the double-deck cars were restored. The refurbished cars were designed to accommodate both vehicles and passengers on the upper deck. Each car can hold up to fifteen tons, and is attached to a steel cable. These cables are made up of six individual ropes, each spun from 36 strands of tempered steel, and formed around a core of hemp. The two hoisting cables are approximately 1,075 feet (328 m) long with a two-inch (51 mm) diameter. They are wrapped around a driving

drum, 16 feet (4.9 m) in diameter and weighing three tons (2722 kg), which winds and unwinds the cables simultaneously. The cables run from the driving wheel through large sheeves that change their direction and align them with the tracks. Each cable uses an air brake, in connection with a large dead-man emergency brake connected to the cables for safety, which automatically takes hold, in the event of a power or operator failure. The original power source to the incline was a steam engine. Today the incline is operated by a 400 HP (298 kW) electric motor. This motor drives the cast-steel drum.

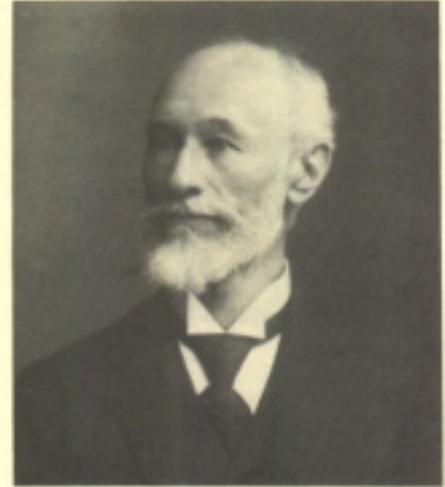
The Johnstown Incline uses many interesting mechanical features. For instance, the power plant is located at a 90 degree angle to the top of the railway, rather than directly beneath it, as was customary. This and other unique features exemplify its historical significance. It is an historic example of the ingenuity and enterprise of the imaginative and skilled Welsh, German, and Slavic people who conquered natural obstacles and frustration to develop a sound industrial economy in Western Pennsylvania.



Drawing of original cars used on the Inclined Plane.

# DESIGNER: SAMUEL DIESCHER

Samuel Diescher was one of the many immigrants who helped to pioneer technology in America. Born in 1839 in Budapest, Hungary, he was educated at Karlsruhe Polytechnic College, Germany, and at the University of Zurich, Switzerland. Diescher came to America in 1866 and settled in Cincinnati, Ohio. He soon married Caroline Endres and worked with her father on other inclines. He relocated to Pittsburgh, and after working as an assistant city engineer, he formed his own firm of consulting engineers. By the end of the 1870's he had designed and supervised the construction of one inclined plane in Cincinnati and three in Pittsburgh. He continued to do transportation work, but diversified his skills into improving coal cleaning and coke processing. He soon became involved with cable railways and electric street cars, but continued to design inclines.



Up until some years before his death, Sam Diescher was very active in Pittsburgh Chamber of Commerce work, and also was president of the Engineer's Society of Western Pennsylvania in 1905. He also was noted for designing the mechanical parts of G.W.G. Ferris' wheel that was such a marked feature at the Chicago World's Fair held in 1892-1893. In 1908, Samuel Diescher retired from engineering and two of his sons assumed the responsibilities of the firm. He passed away on December 24th, 1915, leaving behind a legacy of engineering achievement that includes the Johnstown Incline.



An Uphill view of the Incline.

## REGIONAL HISTORIC MECHANICAL ENGINEERING LANDMARK JOHNSTOWN INCLINE 1891

THIS IS ONE OF SEVERAL, SIMILAR INCLINES BUILT IN WESTERN PENNSYLVANIA DURING THE LATE NINETEENTH CENTURY. IT WAS DESIGNED BY SAMUEL DIESCHER (1839-1915) AFTER THE GREAT FLOOD OF 1889, TO PROVIDE AN EFFICIENT MEANS OF TRANSPORTATION BETWEEN WESTMONT AND THE CONEMAUGH VALLEY.

THE JOHNSTOWN INCLINE IS AMONG THE WORLD'S STEEPEST VEHICULAR INCLINES, WITH A 71 PERCENT GRADE. ITS LENGTH IS 896.5 FEET. THE INCLINE SAVED MORE THAN 4,000 LIVES IN THE FLOOD OF 1936.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS — 1994.

# REFERENCES

Darr, H.H., "History of the Johnstown Inclined Plane," Cambria County Tourist Council, 1982.

Richard A. Burkert & Eileen Mountjoy Cooper, "Uphill All the Way: Johnstown and Its Inclined Plane," Cambria County Tourist Council, 1985.

## THE HISTORY AND HERITAGE RECOGNITION PROGRAM of the ASME

The ASME History Recognition program began in September 1971. To implement and achieve its goals, ASME formed a History and Heritage Committee, initially composed of mechanical engineers, historians of technology, and curator (emeritus) of mechanical engineering at The Smithsonian Institution. The Committee provides a public service by examining, noting, recording, and acknowledging mechanical engineering achievements of particular significance. The History and Heritage Committee is part of the ASME Council on public Affairs and Board of public Information. For further information please contact public Information, American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017-2392, 212-705-7740.

The Johnstown Incline is the 13th Regional Historic Mechanical Engineering Landmark to be designated. Since the ASME Historic Mechanical Engineering Recognition program began in 1971, 163 Historic Mechanical Engineering landmarks, 6 Mechanical Engineering Heritage Sites, and 6

Mechanical Engineering Heritage Collections have been recognized. Each reflects its influence on society, either in its immediate locale, nationwide, or throughout the world.

An ASME landmark represents a progressive step in the evolution of mechanical engineering. Site designations note an event or development of clear historical importance to mechanical engineers. Collections mark the contributions of a number of objects with special significance to the historical development of mechanical engineering.

The ASME Historic Mechanical Engineering Recognition program illuminates our technological heritage and serves to encourage the preservation of the physical remains of historically important work. It provides an annotated roster for engineers, students, educators, historians, and travelers. It helps establish persistent reminders of where we have been and where we are going along the divergent paths of discovery.

# ACKNOWLEDGEMENTS

The University of Pittsburgh at Johnstown Student Section of the ASME gratefully acknowledges the support and participation of the Cambria County Transit Authority, the present owners of the Johnstown Inclined Plane. We would also like to

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thank the ASME Pittsburgh Section for giving us permission to dedicate this landmark, the employees of the Incline for their help and insight and Kandi Forte', brochure author.

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