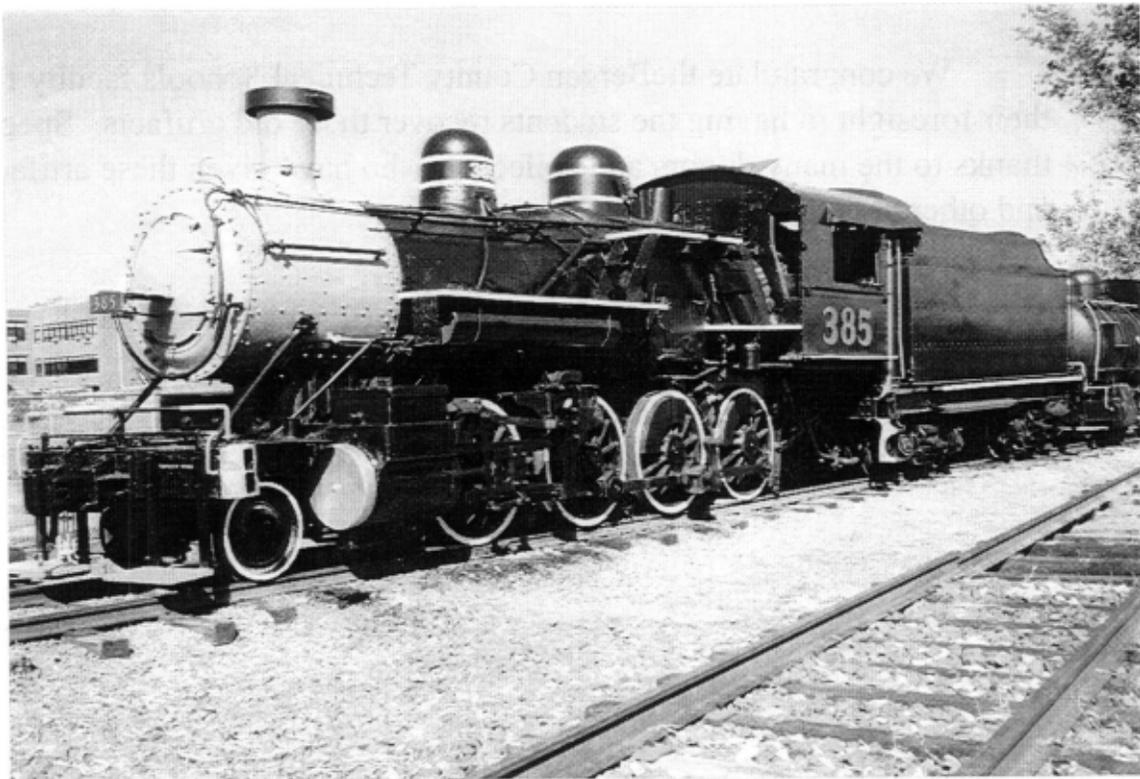


REGIONAL MECHANICAL ENGINEERING HERITAGE COLLECTION

STEAM ENGINE & AUXILIARIES COLLECTION

AT THE

**BERGEN COUNTY TECHNICAL SCHOOL
STATIONARY ENGINEERING STEAM LABORATORY**



HACKENSACK, NEW JERSEY

MAY 21, 1994



**The American Society of
Mechanical Engineers**

PREFACE

This collection of heritage steam engines, locomotives, and auxiliaries represents goals that were set by the students of Bergen Tech in addition to obtaining their general education diploma in Stationary Engineering. The extra curriculum work of overhauling, rebuilding, and painting all these artifacts has provided students with a real appreciation of steam engines, boilers, tools, auxiliary equipment, and safety. They also can say: “I reworked that worn out antique engine; it looks good, runs good, and it is something that I’m proud of.”

Each new project that the students complete adds a well-preserved artifact to Bergen Tech’s Stationary Engineering Laboratory collection.

We congratulate the Bergen County Technical Schools faculty for their foresight in having the students recover these old artifacts. Special thanks to the many donors and collectors who have given these artifacts and other assistance to Bergen Tech.

To Frank Vopasek and his instructors—“It’s a job well done!”

Beal P. Moore

*History & Heritage Chairman
North Jersey Section*

SECTION I

Bergen County Technical School established its Stationary Engineering Course in 1952. It obtained five steam boilers of 748 horsepower, total capacity on. Presently it has four boilers of 1,200 horsepower capacity.

The historic equipment collection was established in 1987 when engines 1, 2, 3, and 4 were installed by the engineering students as a training exercise. Since its establishment, the collection has grown to be recognized as one of the most outstanding displays of steam equipment in the United States. Presently it has twenty-six steam engines and two steam locomotives.

A major consideration is that all equipment is maintained in operable condition and utilized as educational tools. All of the historic equipment is considered irreplaceable and some of the machinery is considered to be the only known example of its type still in existence.

The study of reciprocating steam engines—although considered to be dated pieces of machinery—still teaches many pertinent engineering principles. The fact that these engines are operational nearly one hundred years after their construction is a testament to the engineers who built, ran, and maintained them.

They typify the American spirit of ingenuity and foresightedness probably better than any other mechanical device. Their dependability, reliability, and service life can only be envied by the designers of modern times.

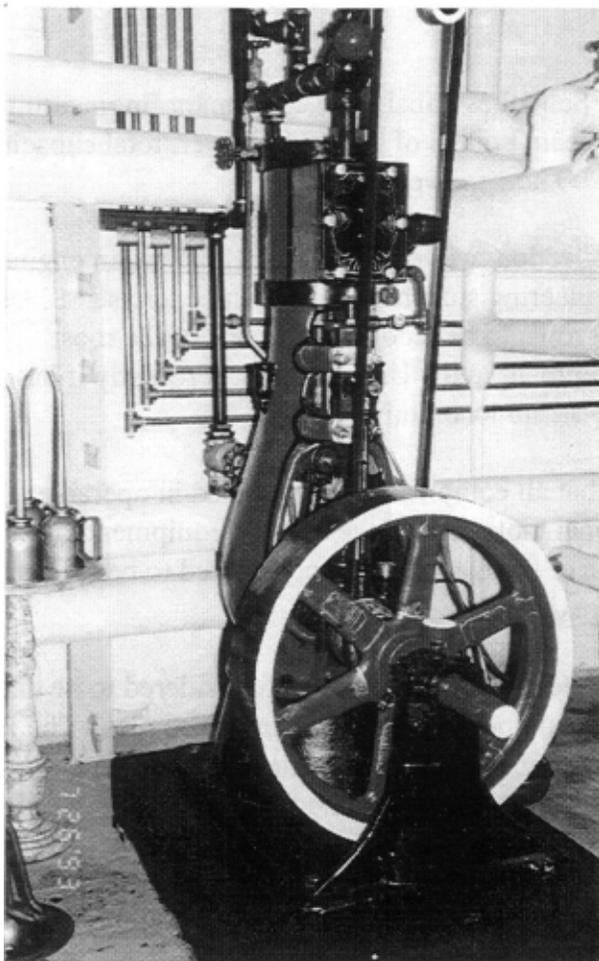
The historic engine collection is in excellent operable condition. All of the stationary engines are restored and operable. Restoration work is proceeding on the two steam locomotives.

The collection is readily available to the public and the engineering department regularly conducts tours, special events, and seminars to promote the awareness of engineering heritage.

The Bergen County Technical School is located at 200 Hackensack Avenue, Hackensack, New Jersey 07601.

To arrange a tour of the engine collection, call (201) 343-6000, extension 234.

SECTION II. THE HERITAGE COLLECTION



Engine #1

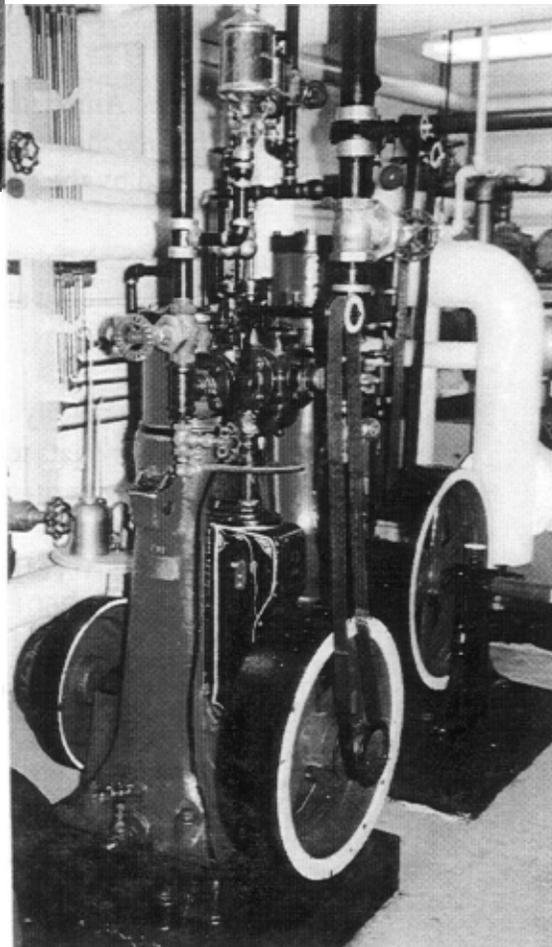
Built in 1896 by Donegan and Swift Company. Single cylinder, 4" x 6" fitted with slide valve. Originally used as a lineshaft drive.

Donated by Vopasek Family

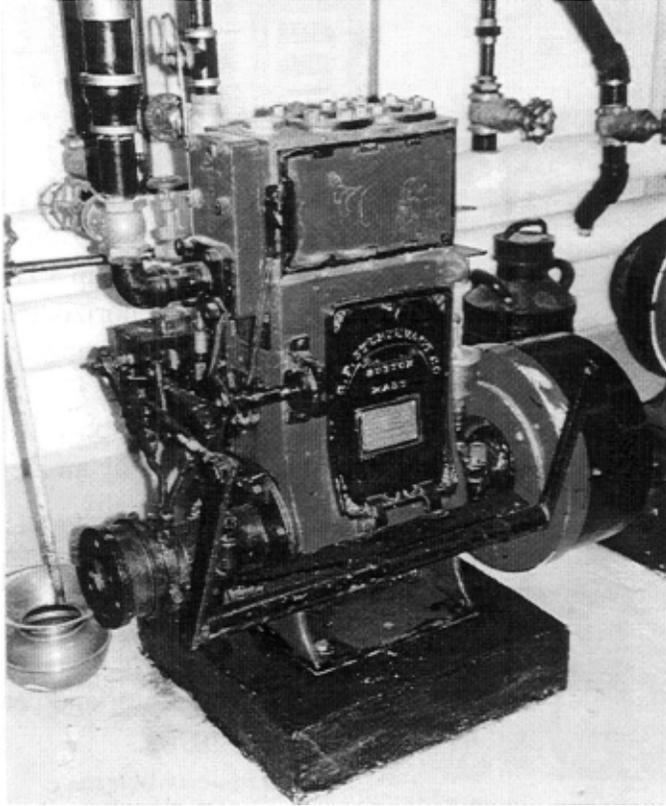
Engine #2

Built in 1930 by the Clarage Company as a stoker drive for the Hackensack Water Company. Single cylinder 4" x 6" with piston valve.

Donated by Vopasek family



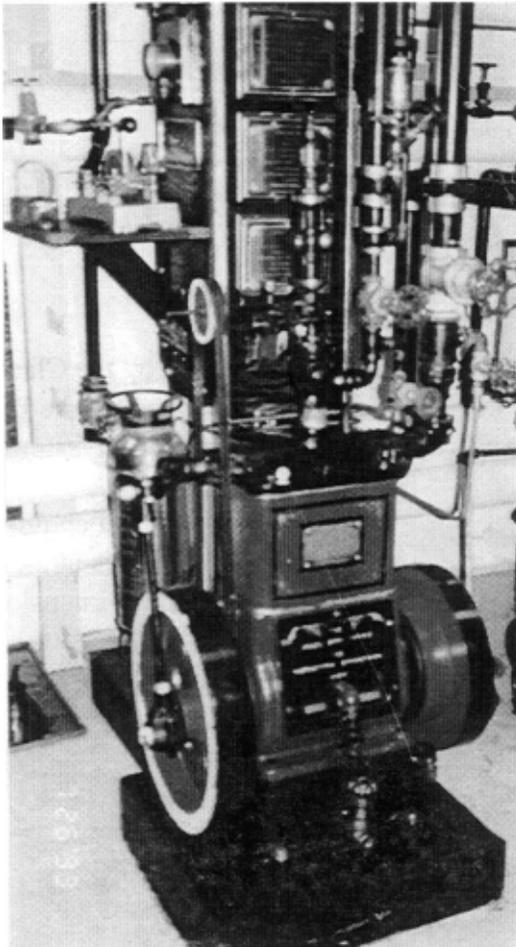
II. (CONTINUED)



Engine #3

Built by the B. F. Sturtevant Company in 1905 and employed aboard a New York harbor tugboat as a hoisting engine. Cylinders are 3 1/2" bore by 2 1/2" stroke and the engine is fitted with Stephenson reverse gear.

Donated by Vopasek family

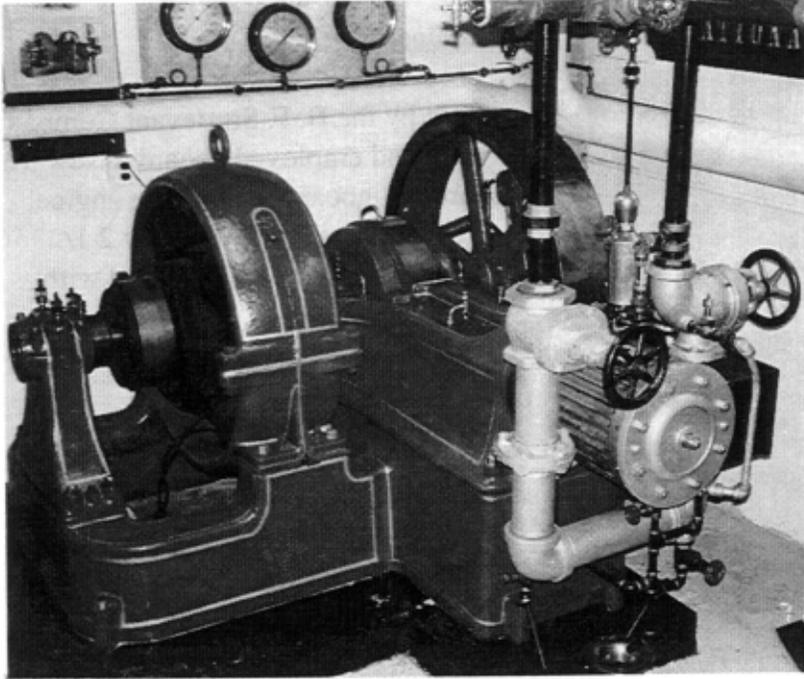


Engine #4

Model "Acme" two cylinder engine built in 1920 by the Combustion Engineering Company. Employed as a stoker drive in a C.R.R. of N.J. powerhouse in Jersey City. A two cylinder vertical engine with cylinder dimensions of 2.5" x 3". Steam admission is by "rocking" valve gear.

Donated by Vopasek family

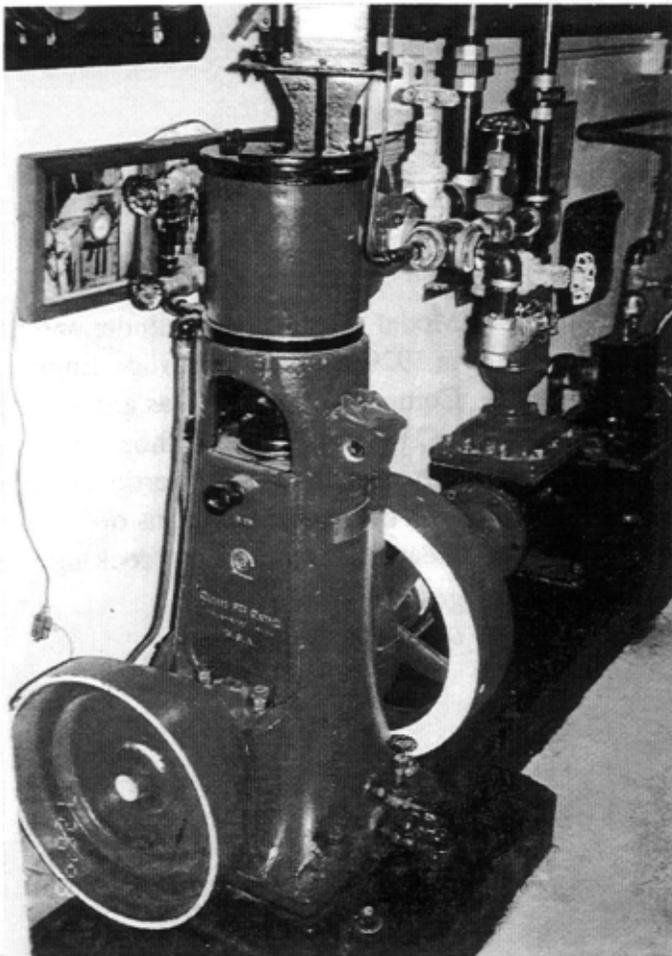
II. (CONTINUED)



Engine #5

Built by the American Ball Engine Company of Bound Brook, New Jersey in 1918. Engine is of the horizontal, single cylinder, center crank variety with a 10" x 8" cylinder. Engine speed is 300 r.p.m. controlled by an inertia governor. Originally installed at a Veterans Hospital in White Plains, New York, the engine is directly connected to a 25 kW D.C. generator and bears builders #10709.

Donated by Jerry Weinstein

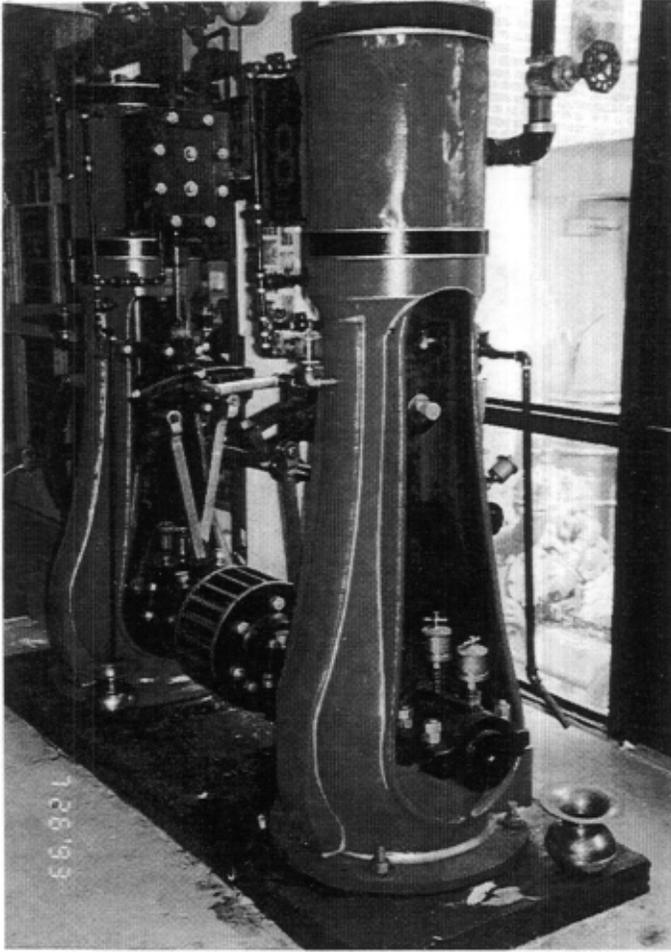


Engine #6 & 7

Built in 1938 by the Clarage Company as stoker drives for the Delaware, Lackawanna and Western Railroad's Long Slip Powerhouse in Hoboken, New Jersey. Twin engines, they bear sequential builders numbers of 2006 and 2007. Cylinder dimensions of both engines are 3 3/8" x 4".

Donated by New Jersey Transit

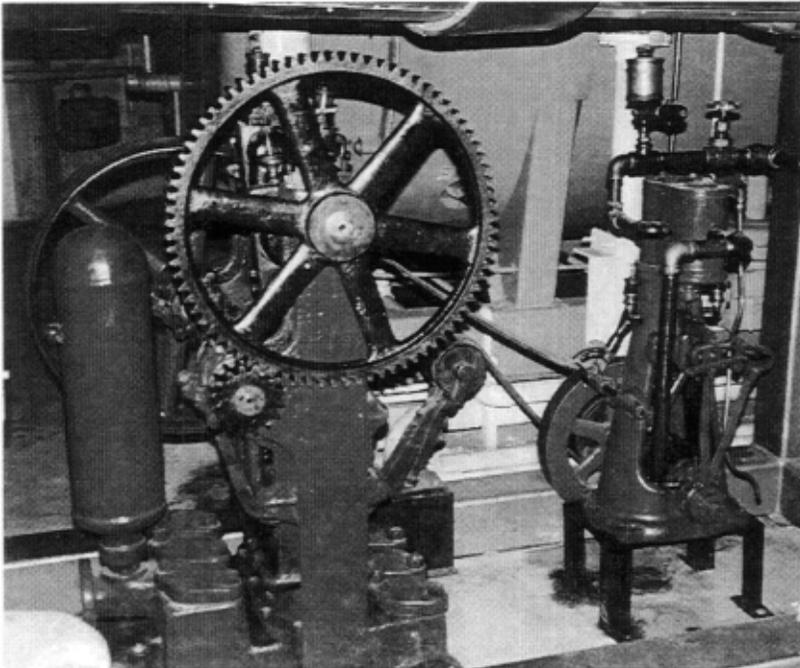
II. (CONTINUED)



Engine #8

Built in 1906 by W. G. & G. Greenfield of Harrison, New Jersey, to power the Jackson Street Drawbridge between Newark and Harrison. Two cylinders 12" bore by 14" stroke share a common crankshaft. The engine is fitted with Stephenson reverse gear and has solid brass eccentric rods.

Donated by the Newark Museum



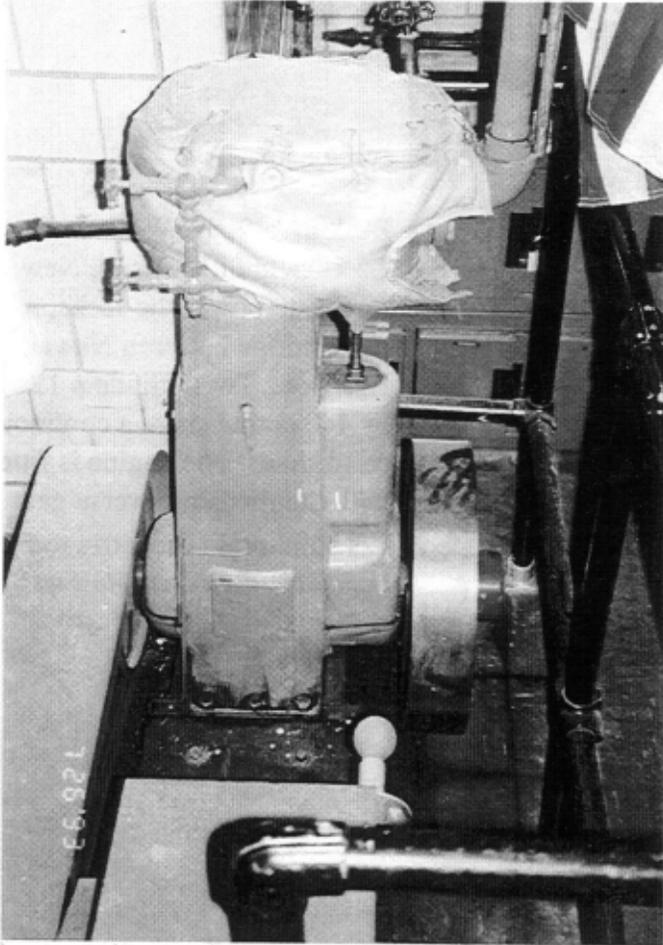
Engine #9

Vertical single-cylinder bottle-frame steam launch engine of 1890s vintage, fitted with Stephenson reverse gear. Engine has cylinder dimensions of 2 1/2" X 3" and is belted to a triplex elevator pump that was manufactured by the Gould Pump Company. Cylinder dimensions of 4" x 6".

Engine acquired from Skinner Engine Company

Pump donated by Mr: Henerson

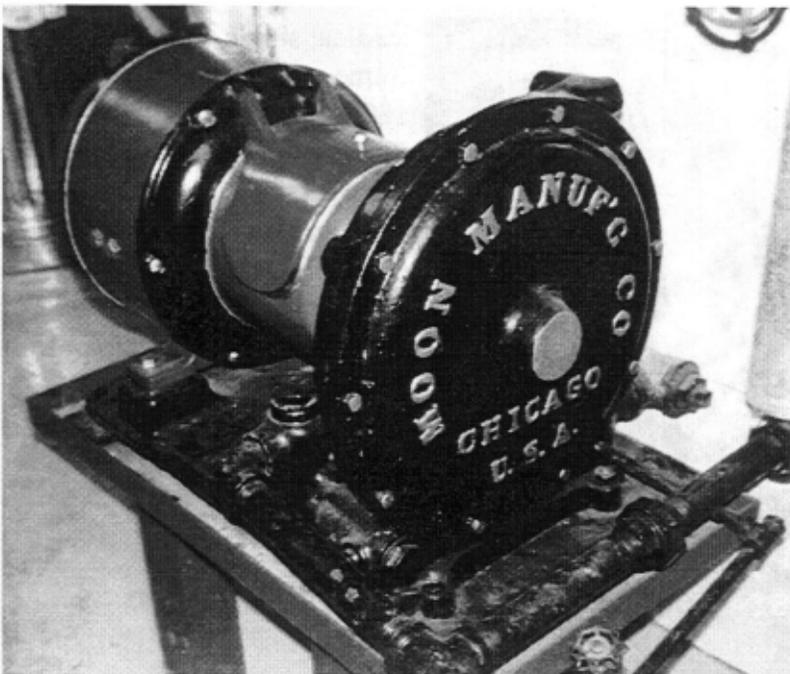
II. (CONTINUED)



Engine #10

Vertical Troy Engburg style single cylinder engine built in 1930. This engine has an inertia governor and drives a 5 kW generator. Steam admission is controlled by piston valve.

Acquired from Skinner Engine Company

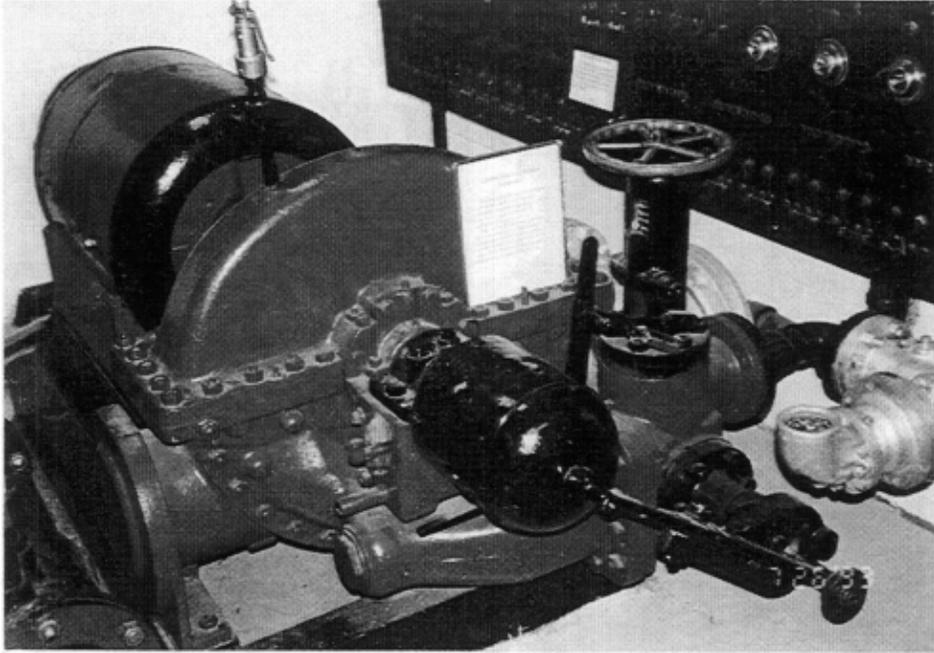


Engine #11 Moon Turbine Generator

Built by the Moon Manufacturing Company in the early 1900s, this 1 1/2 kW turbine generator set was used aboard a Merrit Chapman and Scott floating derrick in New York harbor.

Donated by Vopasek family

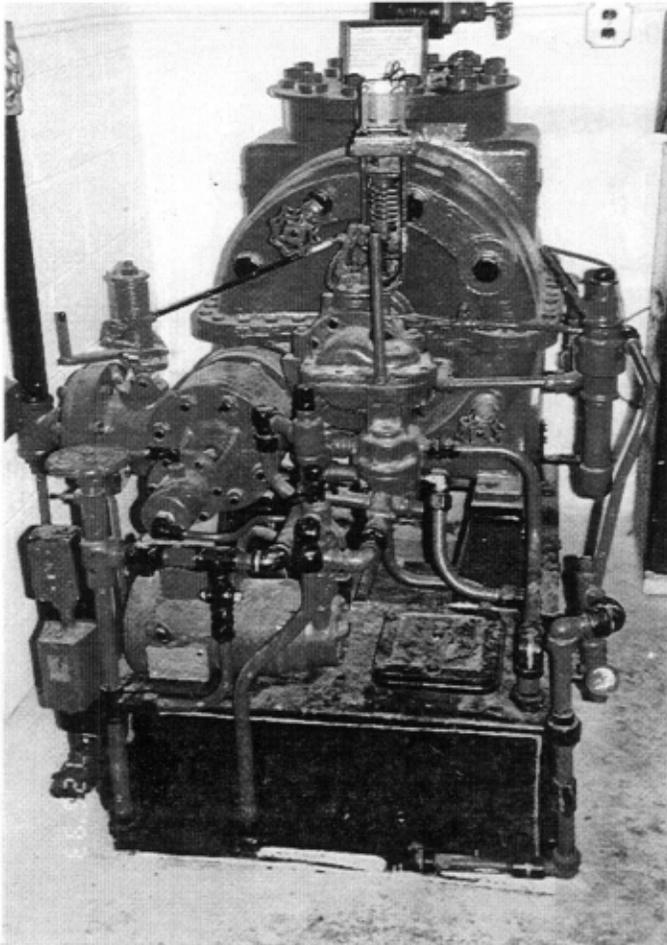
II. (CONTINUED)



Engine #12 G. E. Turbine Generator

This marine type turbine generator set was built by General Electric in 1939 and used as a training unit by the firm.

Donated by General Electric Company

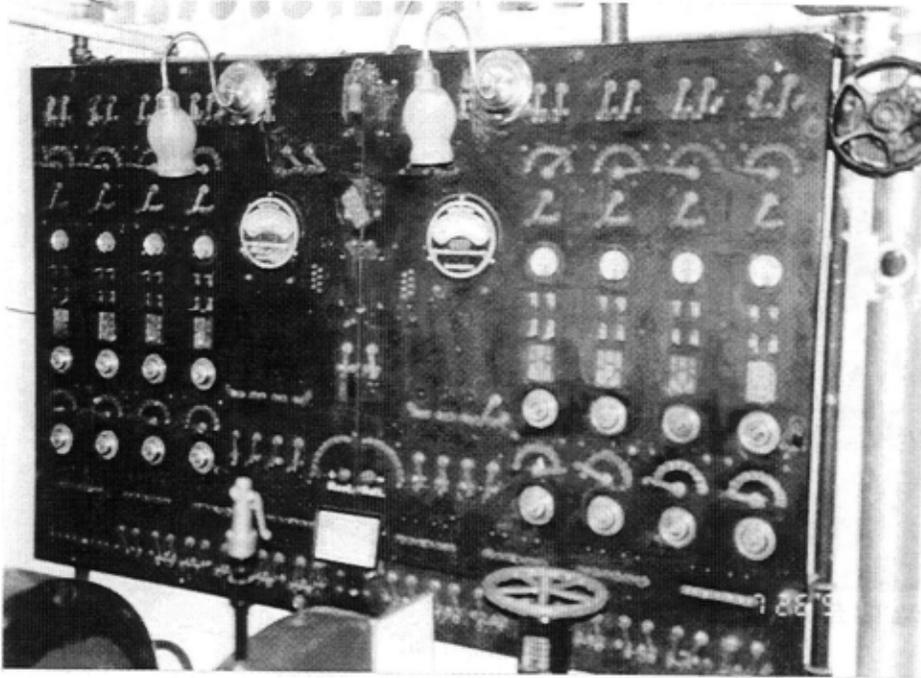


Engine #13 Allis Chalmers Turbine

This 450 HP turbine was built in 1940 and drove a compressor for the Essex Chemical Company of Newark, New Jersey.

Donated by Essex Chemical

II. (CONTINUED)



Engine #14 Gamewell Panel

Original fire alarm panel from the Weehawken Ferry Terminal of the New York Central Railroad. Early 1900s vintage.

Donated by Vopasek family

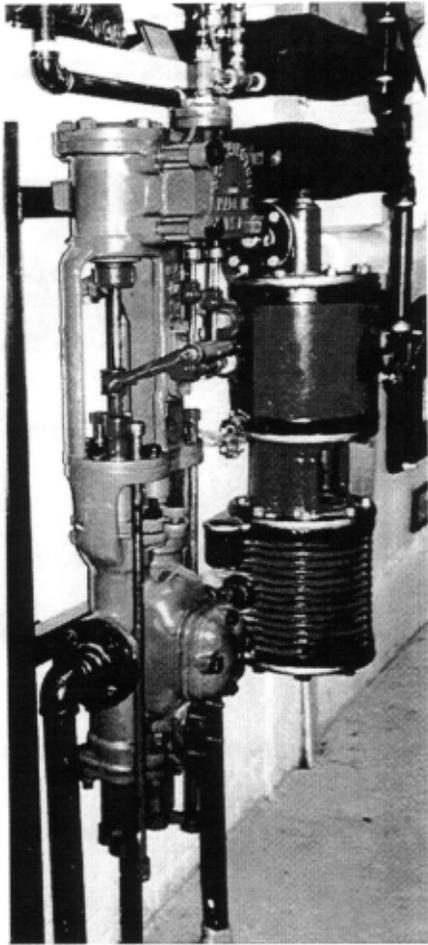


Engine #15 Locomotive Air Compressor

Original equipment from the Campbell Wallpaper Company of Hackensack, New Jersey. Built by the New York Air Brake Company, 1895.

Donated by Packard Bamberger

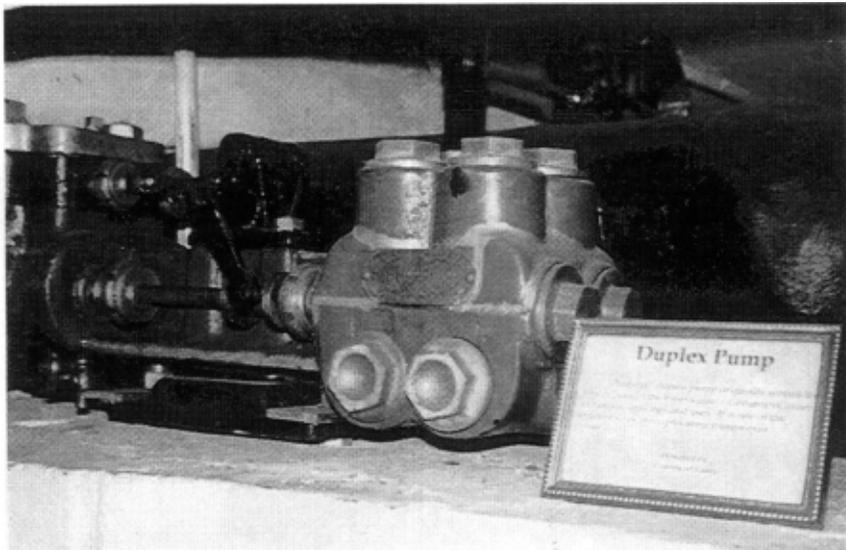
II. (CONTINUED)



Engine #16 Outside-packed Plunger Pump

Built by Worthington in 1940 and recovered from a partially sunken cargo vessel in New York harbor.

Donated by Vopasek family

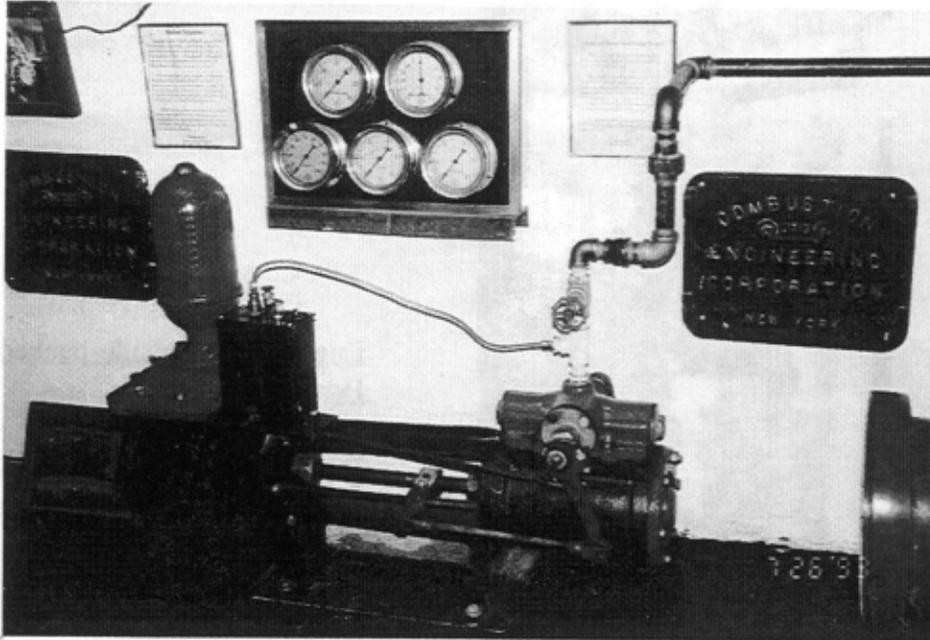


Engine #17 Duplex Pump

Built in 1920 by Blake Knowles Company and installed in an Essex County hospital powerhouse.

Donated by County of Essex

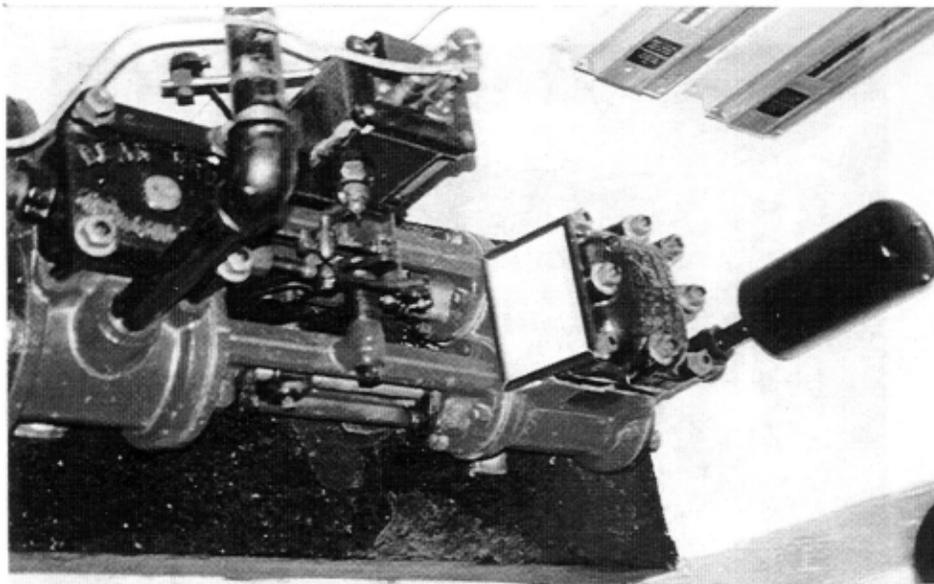
II. (CONTINUED)



Engine #18 American Simplex Pump

Built in 1890 by the American Steam Pump Company and installed in the Colgate-Peet plant in Jersey City as original equipment.

Donated by Matt Kurzius

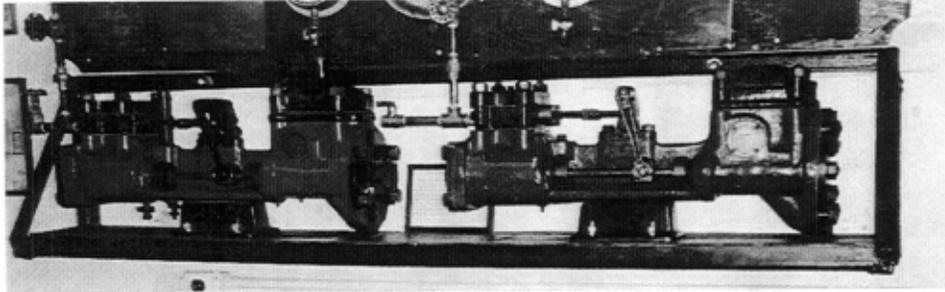


Engine #19 Duplex Fuel-Oil Pump

Built by the Dean Steam Pump Company in 1945 for the Nabisco Company of Fair Lawn, New Jersey.

Donated by the Nabisco Company

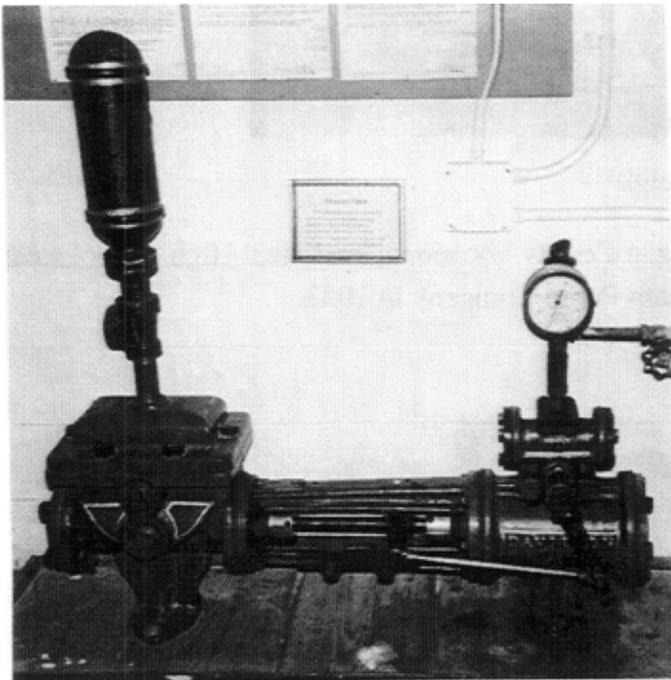
II. (CONTINUED)



Engine #20 Worthington Reciprocating Pumps

These two duplex steam pumps were built by the Worthington Pump and Machinery Corporation of Harrison, New Jersey, in the early 1900s. They were used in local steam plants.

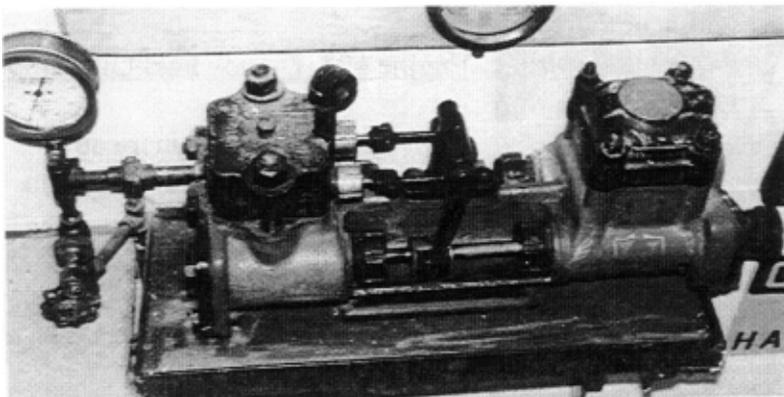
Donated by Vopasek family



Engine #21 Simplex Pump

Built by the Davison Company in 1907, this pump was used in condensate service aboard a New York harbor steamboat.

Donated by Vopasek family

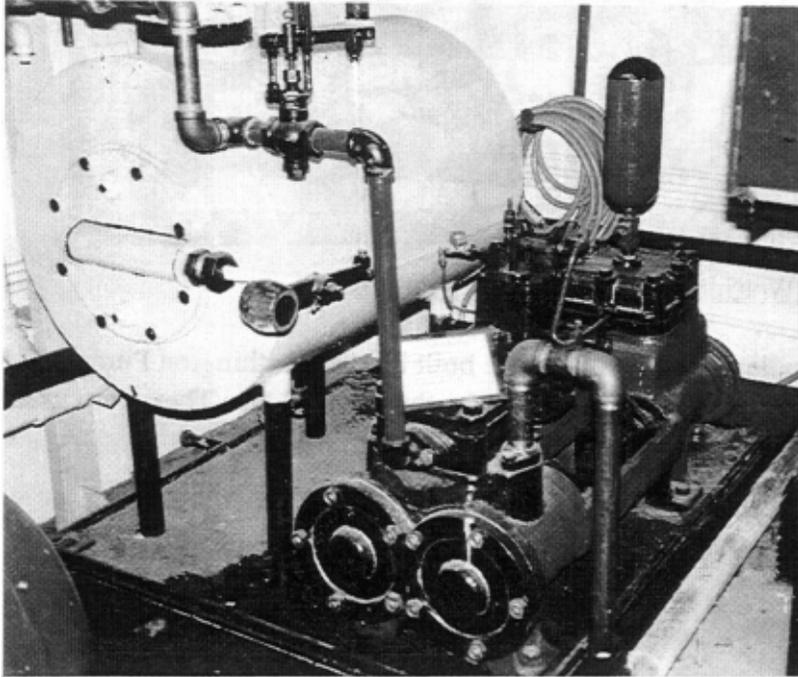


Engine #22 Duplex Fuel-Oil Pump

Built in 1920 by Worthington and used aboard a New York Central Railroad tugboat.

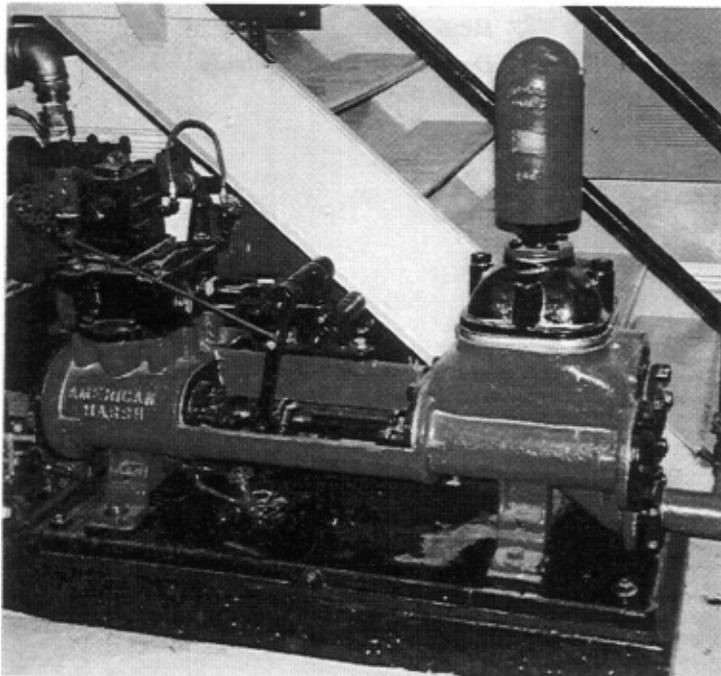
Donated by Vopasek family

II. (CONTINUED)



Engine #23 Gravity Return Pump

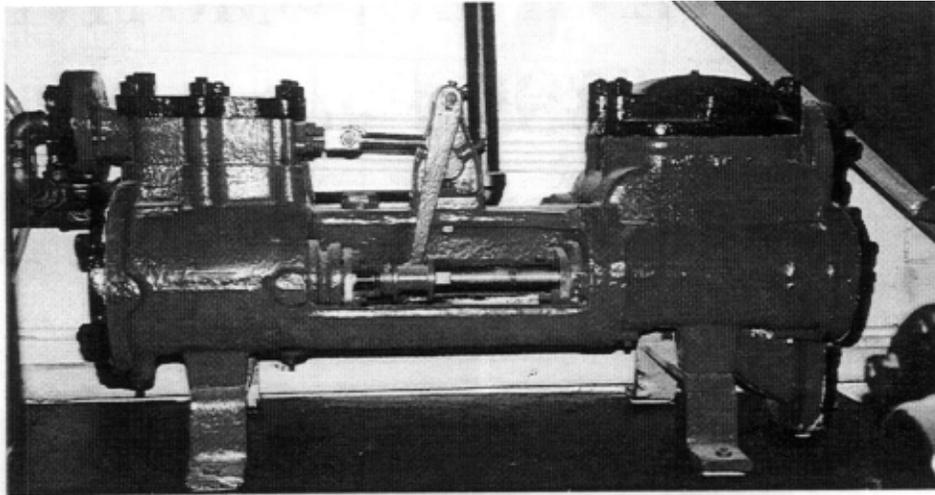
Original equipment of the Bergen County Vocational Technical High School steam plant. Built by the Warren Steam Pump Company in 1953.



Engine #24 Duplex Fuel-Oil Pump

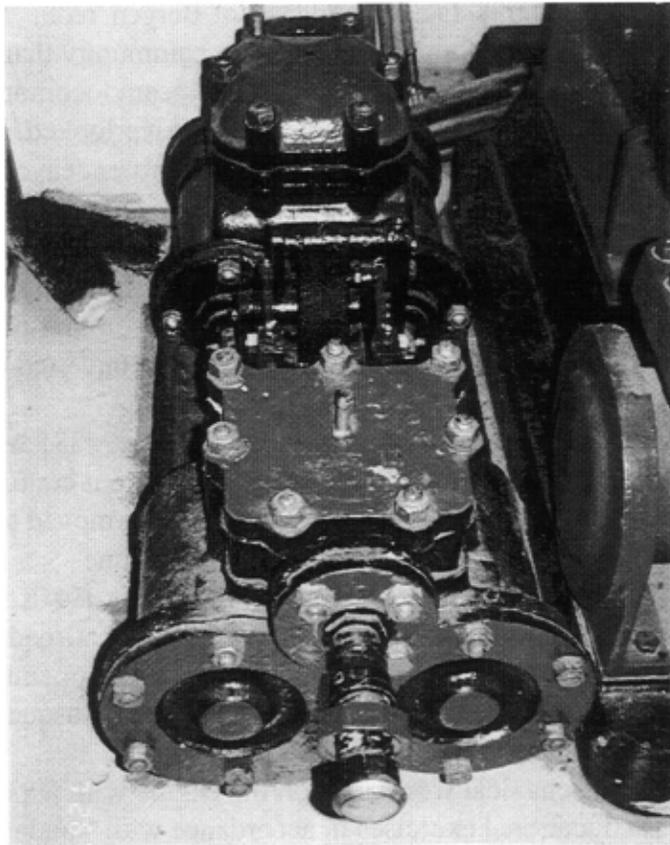
Built in 1938 by the American Marsh Company for the Teterboro facility of the Bendix Company.
Donated by the Bendix Company

II. (CONTINUED)



Engine #25 Duplex Cylinder Feedwater Pump

Worthington Pump Company, 1920



Engine #26 Duplex Cylinder Feedwater Pump

Worthington Pump Company, 1920s.

III. PRESENT PROJECTS

STEAM LOCOMOTIVE

#385 PROJECT



The main thrust of this project is to provide educational opportunities and experiences to students, faculty, and staff of Bergen Tech. The uniqueness of the project itself shall offer opportunities to the community that cannot be replicated elsewhere. While the project of rebuilding a steam locomotive is quite unique, it is of tremendous educational value. Also, not to be overlooked, are the many motivational values and opportunities that are generated by this endeavor.

Locomotive #385 was built by the Baldwin Locomotive Works of Philadelphia, Pennsylvania in November of 1907 for the Southern Railway. It is a 2-8-0 or “consolidation” locomotive designed for fast freight service. The locomotive weighs 93 tons and the tender weighs 31 tons. Operating pressure is 200 psi saturated steam. Originally soft coal fired, the engine was converted to burn oil in the early 1960s.

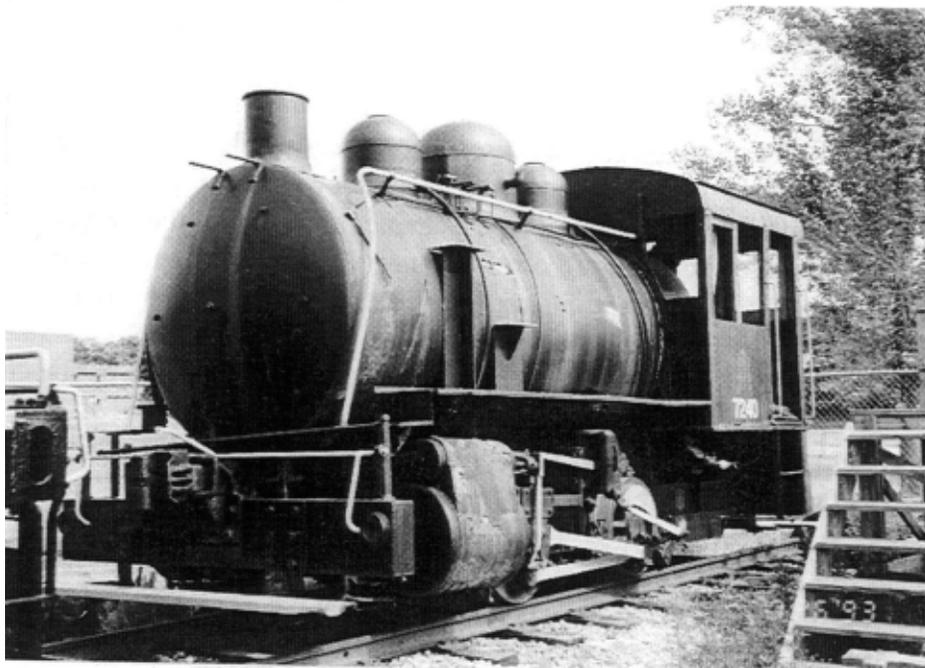
After being retired by the Southern Railway, #385 was sold to the Virginia Blue Ridge Railway in Piney River, Virginia, where it continued in service until the late 1950s. The engine was purchased in 1964 and moved to New Jersey for use on the Morris County Central Railroad, an excursion line.

The #385 continued in service until the early 1980s when it was retired in need of heavy repairs. The Morris County Central Railroad filed for bankruptcy and was absorbed by the Delaware Otsego system, which operated the New York, Susquehanna and Western Railway. The New York, Susquehanna and Western subsequently donated the engine to Bergen Tech.

Most mechanical work done on the engine will be performed by engineering students as educational exercises in accordance with standard school policies and directives. Students are assisted and supervised by regular instructional staff at all times. Some mechanical work will be performed by outside industries, corporations, businesses, and individuals who have the proper experience. The majority of materials needed to affect this restoration will be donated. No donations are accepted without administrative approval. Environmentally sensitive articles are not accepted.

III. PRESENT PROJECTS (CONTINUED)

TEXACO ENGINE #7240 PROJECT



Locomotive #7240 was built by Porter Locomotive Company in 1938. It is one of the newest steam locomotives in existence and is in good condition. The locomotive is a rare “fireless” locomotive with no firebox. It is recharged for operation from a stationary steam plant. This type of locomotive was specifically developed for use in areas where a conventional locomotive would be a hazard with an open fire, such as a refinery or petrochemical plant.

This engine weighs 21 tons, is of the 0-4-0 wheel arrangement and is designed for one-man operation. The engine was built for the Texas Oil Company and served at its refinery in Wilmington, Delaware. The unit was transferred to the firm’s Bayonne, New Jersey, plant in the early 1970s. When the plant was closed and razed for redevelopment the Texaco Company donated the engine to the school for instructional purposes.

The acquisition of this engine is consistent with the long-range goals of the steam locomotives project and offers excellent educational benefits to the Bergen Tech community and the general public.

SECTION VI—PRINCIPAL CUSTODIAN AND DONOR

Bergen Tech's chief engineer is Frank Vopasek, himself a graduate of the program he now oversees and a veteran engineer with many years of stationary marine and locomotive experience.

A fully certified instructor of Stationary Engineering, he holds a State of New Jersey First Class Gold Seal License, as well as a Blue Seal Steam Locomotive License. He writes extensively on steam engineering and frequently lectures upon the topic as well.

Rare by today's standards, he is equally at home programming a microprocessor-controlled steam generator or operating one of the plant's landmark steam engines. Vopasek is a past chapter president of the Bergen Chapter of the National Association of Power Engineers and is the founder of the North Jersey Museum of Power and Steam. He is active in many other civic organizations.

He is lead teacher in charge of the school's evening engineering program and oversees the operation of a division that offers some twelve different courses in the field. He also serves as advisor to the Bergen Tech Engineers Club and is chairman of the Stationary Engineering Advisory Council.

Under Vopasek's direction the heritage steam collection was assembled, moved, installed, and placed in operation at the school. Serving as chief mechanical officer of the Locomotive 385 Project, he is spearheading the effort to return the engine to active service.

Vopasek is a strong advocate of the "hands-on" approach as well as the theoretical approach when it comes to the training of engineers. His program has received recognition for excellence and innovation.

Frank Vopasek sports about town in a 1928 Ford roadster, runs his program from an oak rolltop desk, and celebrates New Year's Eve with his students and a collection of steam whistles that can be heard for miles. Between classes he can often be found speaking to a group of students or attending to the constant demands of operating and maintaining a steam plant.

Busy as he might be, and often is, he is never too busy to help someone in need. Although Vopasek and his students have appeared on national television, on the front page of newspapers, and have been the subject of numerous magazine articles, it is the steady stream of visitors to the Bergen Tech engine room who can best attest to the outstanding work of this remarkable individual.

SECTION V—MAJOR DONORS

Mr. and Mrs. Frank Vopasek and son	Nabisco Company
Texaco Company	Matt Kurzius
New York Susquehanna & Western Railway	Essex Chemical Company
New Jersey Transit Company	General Electric Company
Jerry Weinstein	Packard Bamberger
Jenson & Mitchell Company	R. F. Harz, Sr.
J. Jansson	County of Essex
Bendix Company (Mr. R. Dolinski)	Mr. Henderson

SECTION VI—CONTRIBUTORS OF SERVICES, EQUIPMENT, REPAIR AND TRANSPORTATION

J. Supor & Son Company	Bergen County Technical School
New York Susquehanna & Western Railway	New Jersey Transit/Rail Operations
Railroad Construction Company	Wayne King & Son
Blue Circle Raia Company	Roadmasters, Inc.
The Record	Public Service Electric & Gas Company
Delaware Otsego Corporation	The Newark Museum
Celentano Brothers Company	Bergen #6 National Association of Power Engineers
Aristo Craft Trains Company	

SECTION VII—REFERENCE PUBLICATIONS

1. 'Old 385 goes to school', "An Unusual High School Project." Irwin Koval, July 1990, Live Steam.
2. "Unique Teacher and His 'Steamy' Program give Students a 'Blast'." Irwin Koval, April 1992, School Shop Tech Directions.
3. "Bergen Tech's Engine Room Project." Frank Vopasek, April 1987, Live Steam.
4. Steam in the "Class Room." Frank Vopasek, April 1987, Engineers & Engines.
5. ASME "Report on tour of Bergen Tech Stationary Engineering Facility." Steven Marbaise, January 1993, North Jersey ASME Newsletter.
6. "Choo-Choo Frank" rides a steam train vo-tech curriculum. Joyce Venezia, October 1990, Star Ledger.
7. "84-year-old steam engine has new home." Marion Pagan, August 1990, Bergen Record.
8. "Open House Slated at Bergen Tech." Frank Vopasek, April 1988, National Engineer.
9. "School brings 18 tons of history to life." Tom Topousis, April 1992, Bergen Record.
10. "Bergen County Technology School." Al Putnoky, May 1992, Nutmeg Gratings.
11. "Student Engineers Resurrect Four Steam Engines." Frank Vopasek, March 1987, National Engineer

SECTION VIII—TEXT OF DESIGNATION PLAQUE

REGIONAL MECHANICAL ENGINEERING HERITAGE COLLECTION
**STEAM ENGINES, LOCOMOTIVES AND
AUXILIARIES**
AT THE **BERGEN COUNTY TECHNICAL SCHOOL**

This collection of equipment—all of it maintained in operating condition and used for educational purposes—was established in 1987. It spans the period from the late 19th century to the 1940s, when steam was the prime motive force for most U. S. industries, including rail and marine transportation. Although most steam machinery has been scrapped within the past fifty years, the joy of operating and maintaining it still inspires students and engineers alike. The principles of mechanical engineering are well grounded in the design of such equipment. This machinery will be operational for many more years under the care of the students and faculty of this institution.



THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
HCxxx 1994

SECTION IX –ACKNOWLEDGMENTS

DESIGNATION BROCHURE

Author: Frank J. Vopasek
Photos: Beal P. Moore
Printing: Thomas Coquel (Konica)

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Lawrence Schmerzler, PE
Karl Vindler, PE
Steven Marbaise
Diane Kaylor

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Chairman Morris-Sussex Subsection: Hugh Huntzinger

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SECTION IX—(CONTINUED)

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Richard H. Kelley
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Superintendent: John J. Grieco
Deputy Superintendent: Evan S. Gillingham
Assistant Superintendent: Anthony Miller
Director of Curriculum: John H. Kolmos
Principal: Joyce Chapin

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