NPS Form 10-900
(3-82)

OMB No. 1024-0018
Exp. 10-31-84

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

For NPS use only
received JUL 10 1986
date entered 8-13-86

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

1. Name

historic: Passaic Machine Works, The Watts, Campbell & Company

and or common: Watts, Campbell Company

2. Location

street & number: 1270 McCarter Highway — NA not for publication

city, town: Newark — ___ vicinity of

state: New Jersey code: 034 county: Essex code: 013

3. Classification

Category	Ownership	Status	Present Use	
___ district	___ public	X occupied	___ agriculture	___ museum
X building(s)	X private	___ unoccupied	___ commercial	___ park
___ structure	___ both	___ work in progress	___ educational	___ private residence
___ site	**Public Acquisition**	**Accessible**	___ entertainment	___ religious
___ object	___ in process	X yes: restricted	___ government	___ scientific
	___ being considered	___ yes: unrestricted	X industrial	___ transportation
	NA	___ no	___ military	___ other:

4. Owner of Property

name: Charles (Chad) H. Watts, Jr.

street & number: 1270 McCarter Highway

city, town: Newark — ___ vicinity of — state: New Jersey

5. Location of Legal Description

courthouse, registry of deeds, etc.: Essex County Hall of Records

street & number: Martin Luther King Blvd. (High Street)

city, town: Newark — state: New Jersey

6. Representation in Existing Surveys

title: NJ Historic Sites Inventory — has this property been determined eligible? ___ yes X no

date: 1978 — ___ federal ___ state X county ___ local

depository for survey records: Office of NJ Heritage, CN 404,

city, town: Trenton — state: New Jersey 08625

7. Description

Condition		Check one	Check one
___ excellent	___ deteriorated	___ unaltered	_X_ original site
_X_ good	___ ruins	_X_ altered	___ moved date _____
___ fair	___ unexposed		

Describe the present and original (if known) physical appearance

The Watts, Campbell Company, located at 1270 McCarter Highway in Newark, is possibly the oldest machine shop in continuous operation under the same family ownership in New Jersey. Founded in 1851 under the name, Passaic Machine Works, the company manufactured steam engines until around 1930. The company currently specializes in large-size, non-production machine work, and repairs and replacements for a variety of clients.

The plant, originally consisting of several separate buildings now connected together, occupies five city lots, four fronting on McCarter Highway and one on the corner of East Mill Street and Passaic Street. In the 1880s, the company was housed in approximately eleven buildings including a foundry across Passaic Street on the Passaic River; the riverfront buildings were sold off in 1938, and are now occupied by Art Metal U.S.A., a manufacturer of steel office furniture. The plan of Watts, Campbell Company is "L"-shaped, made up of three of the five city lots. The remaining lots, #21 and #22, are used for employee parking. The office occupies part of the corner lot (#18) at the intersection of East Mill Street and McCarter Highway. On the north and the east, lots #20 and #13 respectively, is the machine shop.

The office, a three bay, three story, white stuccoed structure, was altered from its original appearance in 1950 when the slate and tin mansard roof was flattened, the brick walls stuccoed, and the windows, door and door surround replaced. The main entrance was also moved from East Mill Street to McCarter Highway (formerly Ogden Street). This 19.0' x 40.0' building is divided into a cellar and three floor levels: a first story office, a second story drafting room, storage for patterns on the third floor and valves and supplies in the cellar. The interior of the building has undergone few alterations since the 19th century and retains its character with tongue and groove wood wainscot, chair rails, elaborate window and door moldings, wooden floors and much original office furniture. Alterations include linoleum over the first floor wood floor and suspended acoustic tile ceilings on the first and second floors.

The machine shop, which envelopes the office on the north and the east, is connected to it by stairs and an entrance off the east wall of the office. Built of brick, the machine shop varies from one to two stories in height. On its north and west sides, the machine shop is stuccoed to match the office, however, cast iron star shaped bosses betray its brick facades. The south and east facades have retained their original facades with alterations limited to the infilling of openings (windows and doors) on the ground floor.

Immediately behind the office and forming part of the southern facade of the plant is a two story, seven bay section of the machine shop. Each story is delineated by a course of brick corbelling above the windows. All the first story windows and door (fifth bay from the west corner) have been infilled. The second story windows are set in segmentally arched brick surrounds. The fifth bay from the western corner is a hoistway door surmounted by two beams from which

a pulley system must have operated at one time. An unornamented pressed metal cornice edges the gabled roofline.

East of this section is a single story, three bay "blacksmith shop" which housed a forge in the 19th century. Although now part of the machine shop, it is still called the "blacksmith shop", and it retains features of its function such as the immense arched entrance flanked by a small single windows. The arch, now infilled with brick, once contained a set of large wooden batten doors. Below the bracketed wood cornice are unusual cast iron bosses in the shape of wheels. A small brick structure, also with a wooden cornice, connects the "blacksmith shop" with the two story brick machine shop extending along Passaic Street. This small connecting structure stands on what was once a "coal alley" leading to the boiler plant, behind which one can see the brick stack.

The two story brick machine shop wraps around the north and east facades of the office building. An elongated gabled roof structure with a clerestory, it consists of a multiple bay facade with segmental arched windows. The five bay McCarter Highway shop facade contains a central arched overhead door operated on pulleys. Flanking this door are large vertical multi-pane windows, above which are two smaller matching windows with inset ventilator panels. Originally these windows were segmentally arched four sash windows, possibly casement. These were changed when the exterior was modernized in 1950. A brick parapet roof was also added to the front of the building. To the south of this facade section are an additional two bays which illuminate the interior between the main body of the machine shop and the office. This stuccoed section of the shop is connected to a larger brick shop behind it, paralleling Passaic Street.

The two story, 18 bay machine shop section along Passaic Street is of common bond brick construction with bluestone lintels and sills and a wooden cornice. The third bay from the south contains a batten door on the first floor and a hoistway door on the second. In the center of the first floor is a large metal overhead door which serves as the vehicle entrance. Immediately next to it on the south is a door for the "shipping and receiving" functions of the plant. All the first floor windows have security bars, the second floor windows are boarded up.

The main part of the machine shop, north and east of the office and facing McCarter Highway, is a large and tall open space with an open truss and post and beam supported roof illuminated with a clerestory and skylights. Interior finishes include painted brick walls and wood ceilings. A rail curves throughout the facility.

The plant equipment dates from the 1880s to the 1920s, and includes an immense vertical boring mill, horizontal boring mill, wooden pivoting cantilevered hoist, lathes, drill presses, grinders, planers, slotters and jib cranes. Below the roof is an overhead horizontal wooden bridge crane and alongside both sides of the crane the original belt driven overhead shaft gearing. Originally the entire shop was run on the power provided by one steam engine. Today the shop is run on electricity provided by a local utility.

8. Significance

Period	Areas of Significance—Check and justify below				
___ prehistoric	___ archeology-prehistoric	___ community planning	___ landscape architecture	___ religion	
___ 1400–1499	___ archeology-historic	___ conservation	___ law	___ science	
___ 1500–1599	___ agriculture	___ economics	___ literature	___ sculpture	
___ 1600–1699	___ architecture	___ education	___ military	___ social/ humanitarian	
___ 1700–1799	___ art	X engineering	___ music	___ theater	
X 1800–1899	___ commerce	___ exploration/settlement	___ philosophy	___ transportation	
X 1900–	___ communications	X industry	___ politics/government	___ other (specify)	
		X invention			

Specific dates 1851, 1865, 1883 **Builder/Architect** Unknown, assumed Watts, Campbell designed

Statement of Significance (in one paragraph)

The Watts, Campbell Company is significant in the areas of engineering, industry and invention. Probably the oldest machine shop in continuous operation under one family ownership in New Jersey, the company is the oldest functioning industrial facility on the Passaic River in Newark (Karschner 1985:130).

Established in 1851 as the Passaic Machine Works by William Watts and Zachariah Belcher, the company was first established in a Washington Street factory. By 1853, they had moved to the corner of Ogden (McCarter Highway) and Passaic Streets and erected a small building (Shaw 1884: 598). Zachariah Belcher withdrew from the firm in 1855, after which it was run by William and George Watts. (William Watts had been an apprentice of Seth Boyden, famous Newark inventor). In 1865, with the reorganization of the firm to include Daniel T. Campbell and Henry Parsons, the firm was renamed Watts, Campbell and Company (Ford 1874: 67). After the death of William Watts in 1883, the firm was again reorganized with George Watts, Daniel T. Campbell, Mary Belcher and Charles Watts as incorporators (Shaw 1884: 598). George Watts, a chemist by profession, had emigrated from Bristol, England in 1821, and died in 1888. Charles Watts apprenticed with Hewes and Philips Company on a pit lathe prior to joining Watts, Campbell and Company (interview with Chad Watts, 2/10/86).

By 1874, the chief products of Watts, Campbell and Company were steam engines, sugar plantation machinery and machine tools. Most of the sugar estate machinery was shipped to Cuba. Other equipment was sent to markets in the east, south and west. In 1874, the plant employed 125 men, had a weekly payroll of $1,700 and yearly products valued at $275,000 (Ford 1874: 67). By 1875, Watts, Campbell ranked second in Newark only to Hewes and Phillips in total output of steam engines, machinery and tools (Cunningham 1954: 134). By 1884, the company employed 320 men with sales over $300,000 and shops covering 1 ½ acres (Shaw 1884: 598).

The Watts, Campbell Company specialized in the manufacture of Corliss steam engines, a necessity for Newark's developing industry in the second half of the 19th century. Steam power was the ideal solution for industrial energy as the Passaic River was unable to generate sufficient hydropower below the fall line, and an abundance of anthracite coal was available due to the transportation advantages of the Morris Canal. Prominent Newark companies who were supplied with Watts, Campbell Corliss engines included: Clark Thread Company, Ballantine Brewery, The Celluloid Company, Weston Electric and Wiss Shears. At the Newark Industrial Exhibition of 1872, Watts, Campbell displayed both vertical and horizontal steam engines (Karschner 1985: 130 and The Watts-Campbell Co.: c. 1887).

9. Major Bibliographical References

See continuation sheet.

10. Geographical Data

Acreage of nominated property less than 1

Quadrangle name Orange **Quadrangle scale** 1:24000

UTM References

	Zone	Easting	Northing		Zone	Easting	Northing
A	18	570260	4511180	B			
C				D			
E				F			
G				H			

Verbal boundary description and justification

Site is located on the easterly side of McCarter Highway, on the southerly corner of East Mill Street. Newark Tax Map: Block 436, Lots 13, 18, 20-22

List all states and counties for properties overlapping state or county boundaries

state	code	county	code
		NA	
state	code	county	code

11. Form Prepared By

name/title Ulana D. Zakalak

organization Newark Preservation & Landmarks Committee **date** 02/21/86

street & number 868 Broad Street, 2nd floor **telephone** (201) 622-4910

city or town Newark **state** New Jersey

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

___ national ___ state X local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

Deputy

State Historic Preservation Officer signature Helen C Zemba

title Assistant Commissioner for Natural Resources **date** 6/24/86

For NPS use only

I hereby certify that this property is included in the National Register

Entered in the National Register

for Melvin Byers **date** 8-13-86

Keeper of the National Register

Attest: **date**

Chief of Registration

In the areas of engineering and invention, Watts, Campbell and Company received three patents for their improvements on the Corliss steam engine and considered themselves the manufacturers of the "improved Corliss steam engine, 30 to 2,000 horsepower" (company letterhead from the 1880s). The company advertised its steam engines as "very adaptable, useful for electric-lighting purposes, and for driving the machinery in cotton and woolen mills". They were considered the first builders to keep the exhaust system separate from the walls of the cylinder: "in all sizes of our engines it (the exhaust) is separated as soon as it leaves each end of the cylinder, and is carried to a common outlet in the passage forming a part of, yet entirely distinct from, the cylinder proper. The economy of this in lessening the loss from condensation in the cylinder is not recognized by all engineers" (The Watts, Campbell Company c. 1887: 4). The company was also responsible for the invention of the "dash-pot", a shock absorber for the valve allowing extremely rapid valve closure without jar, shock or noise, thereby lengthening the life of the valves (The Watts-Campbell Co. c. 1887: 6).

Other improvements included: a distinctive cross-head with removable shoes, tapered cross-head pin and tapered piston rod secured by a cross-key; ball-and-socket bearing for the dash-pot plunger; a releasing gear adapted to high rotative speeds and designed to improve the regulation of the governor; slotted end connecting-rod: improved piston and piston packing; and safer balance, belt and rope wheels (The Watts-Campbell Co. Corliss Steam Engines n.d.: 10-20).

Steam engine production continued until the mid-1920s, by which time most companies had switched to utility-provided electricity. The company continued manufacturing replacement parts and repairing old equipment. According to the present owner, Chad Watts, the last repair call made by the company on a steam engine was at least fifteen years ago (circa 1970). The Watts, Campbell Company maintains files of old drawings and patterns for its steam engines as well as those of the Hewes and Phillips Company which closed around 1912.

Note: The name of the company has changed many times throughout its history. It was founded as the "Passaic Machine Works", then changed to "The Watts, Campbell and Company". Sometime at the end of the 19th century, the name was changed to "The Watts-Campbell Company". The current name of the company is "The Watts, Campbell Company".

Cunningham, John T. Made in New Jersey. New Brunswick, N.J.: Rutgers University Press, 1954.

Ford, William. The Industrial Interests in Newark. New York; Van Arsdale and Co., 1874.

Karschner, Terry. Industrial Newark. Compiled by Terry Karschner for the 14th Annual Conference of the Society for Industrial Archaeology, May 1985.

Shaw, William. History of Essex and Hudson Counties, New Jersey. 3 Vols. Newark: Everts and Peck, 1884.

Pamphlets

Guzzo, Dorothy, "Watts, Campbell Company Machinery and Floor Plan". Prepared for the 14th Annual Conference of the Society for Industrial Archaeology, May 1985.

The Watts-Campbell Company: Corliss Steam Engines. n.p.: no publ., n.d.

Illustrated Circular of Improved Corliss Steam-Engines built by The Watts-Campbell Company. New York: DeVinne Press, n.d. (c. 1887).

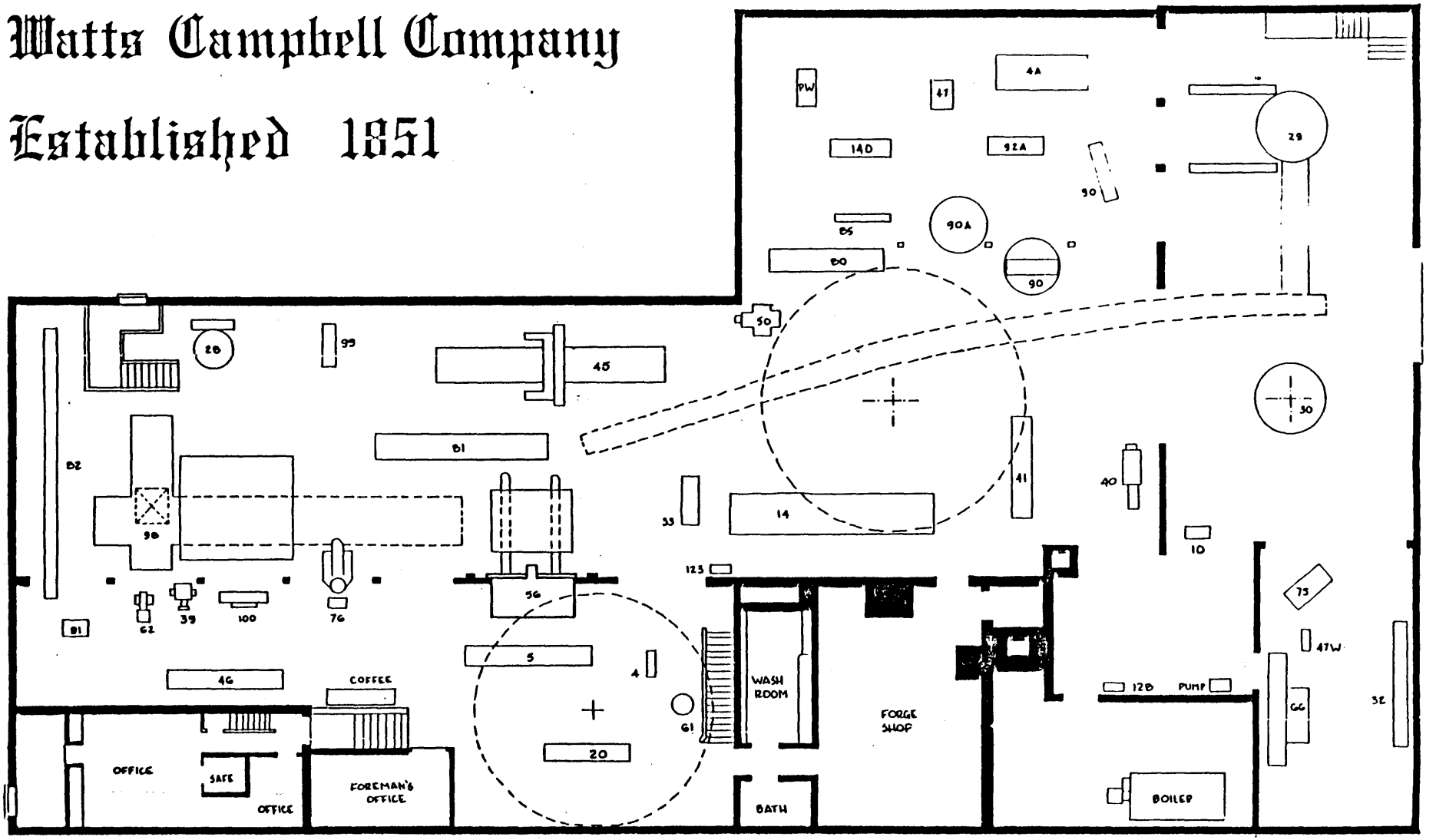
Maps

"Passaic Machine Works, The Watts, Campbell Co." Insurance Survey #9329, November 17, 1887, revised February 18, 1888, in the possession of Chad Watts, proprietor.

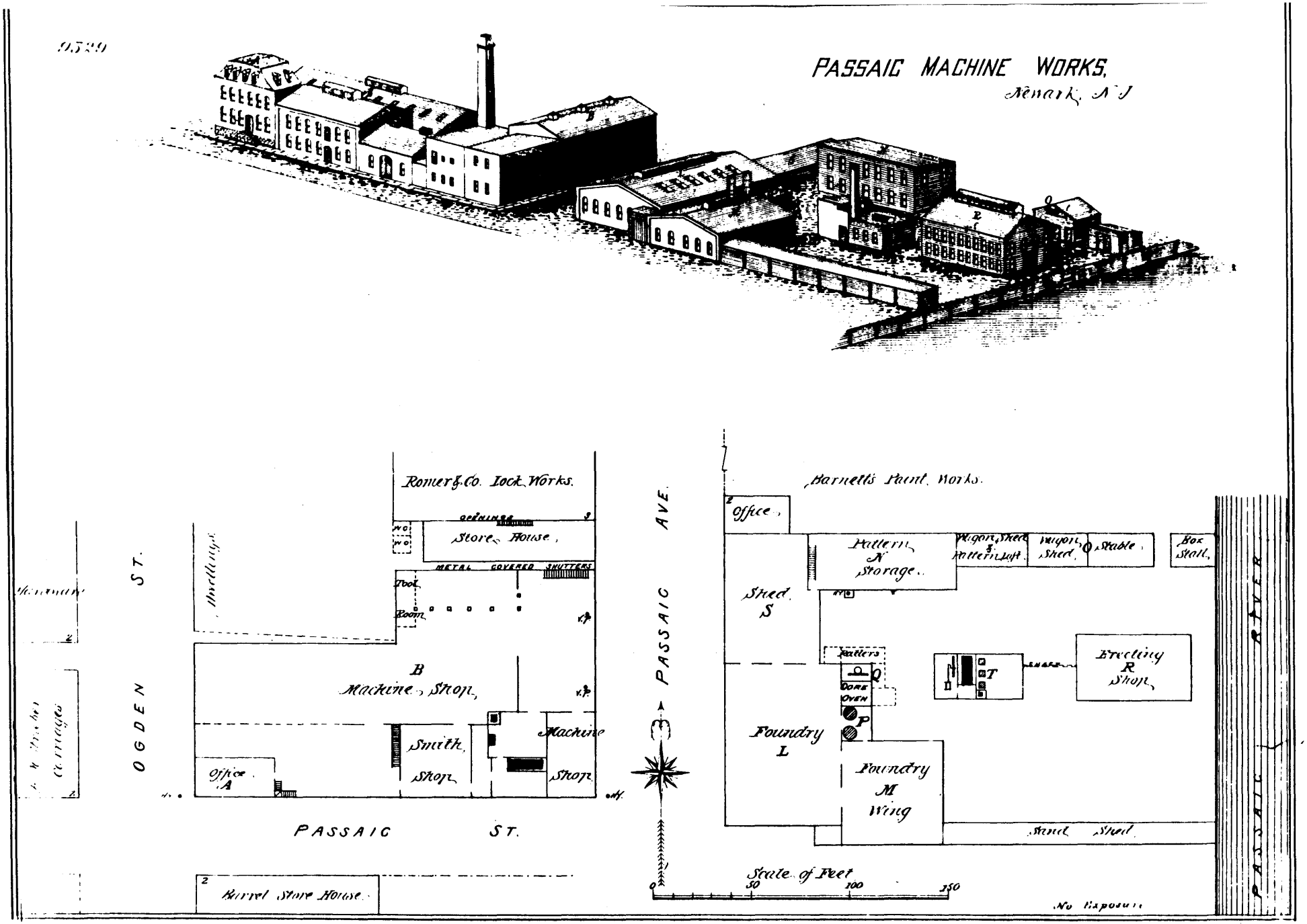
Interview with Charles (Chad) H. Watts, Jr., proprietor, February 10, 1986.

Watts Campbell Company

Established 1851

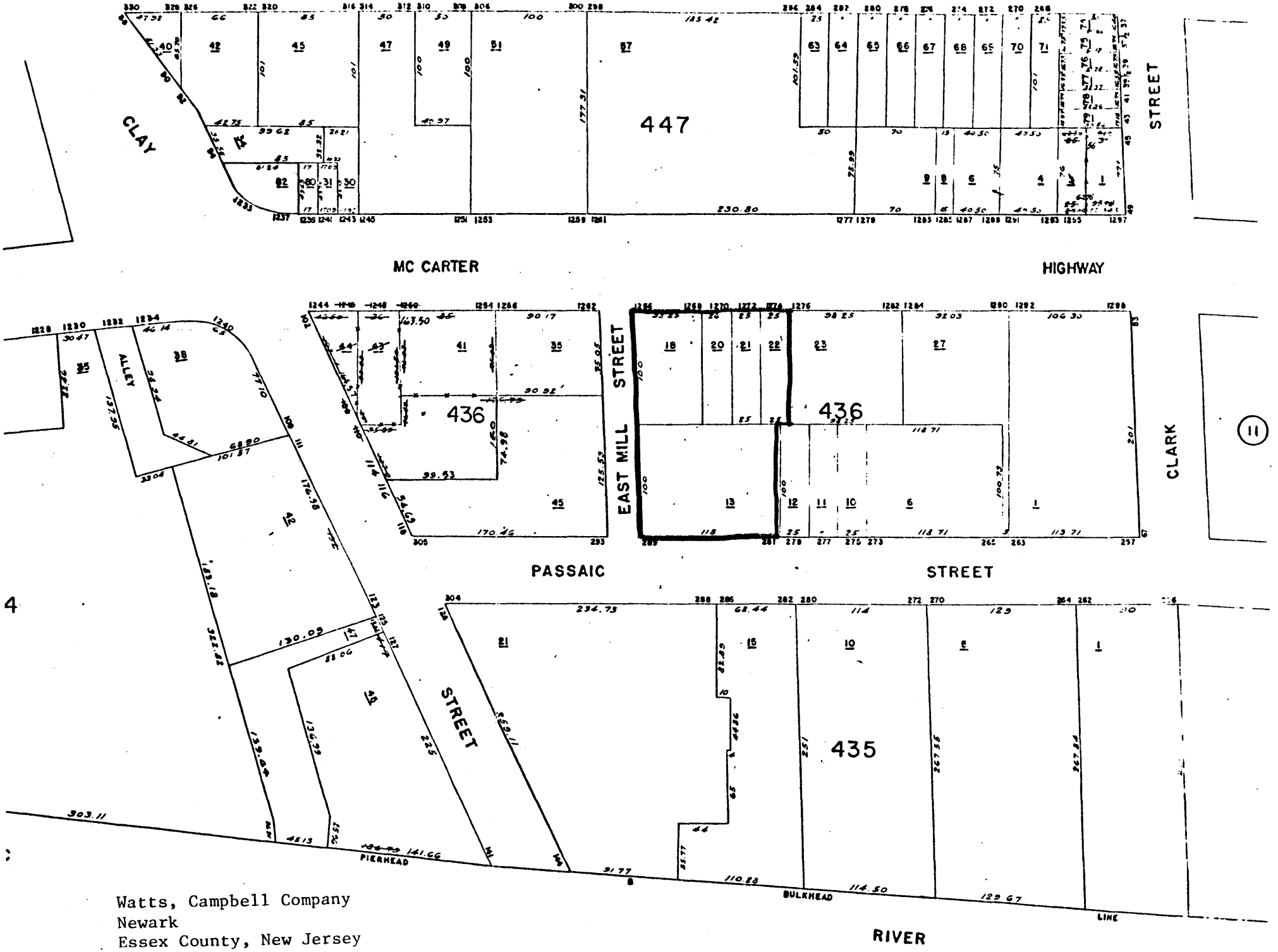


Watts, Campbell Company
Newark
Essex County, New Jersey



The Watts, Campbell Company
1270 McCarter Highway
Newark, Essex County
New Jersey 07104

1887 Insurance Survey
February 1986
Photo by: Ulana D. Zakalak



Watts, Campbell Company
Newark
Essex County, New Jersey

WATTS, CAMPBELL COMPANY MACHINERY AND FLOOR PLAN (Newark, Essex County, New Jersey)

prepared by Dorothy Guzzo

4 SURFACE GRINDER - Used for finishing flat or plane surfaces. The first commercial grinding machine developed around 1864 and was used only as a precision machine for grinding hardened parts and correcting slight errors due to warping.

5 CYLINDER GRINDER - Used in grinding cylindrical parts such as shafts, piston rods, etc.; mainly for the final finishing dimensions.

14 90" O LATHE - A machine tool used for shaping metal by causing them to revolve while acted upon by a cutting tool held by a slide rest. Manufactured by Ames Manufacturing Company, Chicopee, MA.

20 SUBMERGED ARC WELDER - A machine used for heating the work to be welded by means of an electric arc.

28 VERTICAL BORING MILL - Consists of a circular table which revolves about a vertical axis so that the work holding surface is horizontal, thus making it comparatively easy to place in position and hold large circular castings such as flywheels, cast iron covers, etc. Manufactured by Niles Tool Works, patented April 1871, Hamilton, Ohio.

29 VERTICAL BORING MILL - Designed and built by Watts Campbell Company, probably before 1883.

30 VERTICAL BORING MILL - Manufactured by Betts Machine Company, Wilmington, Delaware.

32 100 TON HORIZONTAL WHEEL PRESS - A machine which works by exerting pressure upon or squeezing the material on which it operates.

33 200 TON VERTICAL PRESS

39 CAM MILLER - As the work table revolves, the cutter is caused to move so as to reproduce the required outline on the work. The patent for this type of machinery was given to W.B. Bement, June 3, 1862. This was used to mill cams (revolving disk) during the manufacturing of steam engines. Probably over 100 years old.

40 VERTICAL MILLING MACHINE - Machine used in the shaping of metals by means of a cylindrical revolving cutter with serrated edges or cutting teeth. This machine is a product of the Ingersol Milling Machine, Co., Rockford, Illinois, patent July 8, 1902.

41 HYDRAULIC PLANER

45 PLANER - Machinery used for putting a smooth surface on metals. One of several built prior to 1884 by Hewes & Phillips Company.

46 14" LONG PLANER - Produced by Pond Machine Tool Company, Worcester, MA.

47 HORIZONTAL MILLING MACHINE - 75 years old.

47W WEBB MILLING MACHINE - 2 years old.

50 SLOTTER - Used for the vertical cutting of grooves and keyways; also shapes curved outlines; can be considered a vertical planing machine for making mortises. Manufactured by Bement Niles and Company in Philadelphia.

56 HORIZONTAL DRILLING MACHINE - Used for drilling holes in machine parts.

61 VERTICAL BORING MILL

62 SHAPER - A form of planer in a lathe. The motion of the tool is in line parallel with the axis of the arbor. Manufactured by Gould & Eberhardt in Newark, N.J.

66 TAPE-DRILLING MACHINE

75 RADIAL DRILL PRESS - Drill head is mounted upon a radial arm adjustable vertically and also horizontally by swinging the arm about its supporting column; the drill is pressed or forced through the metal as it revolves. Manufactured by The American Tool Works in Cincinnati.

76 RADIAL DRILL PRESS

80 LATHE

81 48" SWING LATHE - Manufactured by the New Haven Manufacturing Company.

82 34' 6" LATHE - Manufactured by Niles-Bement Pond Works in Plainfield, New Jersey.

85 LATHE

90 VERTICAL BORING MILL - Manufactured by Niles-Bement Pond Company in Hamilton, Ohio.

90A VERTICAL BORING MILL

91 MILLING MACHINE

92 LATHE

92A LATHE

99 HORIZONTAL BORING MILL - Manufactured by Universal Boring Machine Company in Hudson, MA.

#100 MILLING MACHINE

#110 BRIDGE CRANE (not shown) - Over the width of main bay, beams made of wood; age unknown - approximately 100 years old. Horizontal straight line movement in one direction only, the bridge being in a fixed position while a trolley moves along the bridge.

#140 LATHE

P/W PRATT & WHITNEY

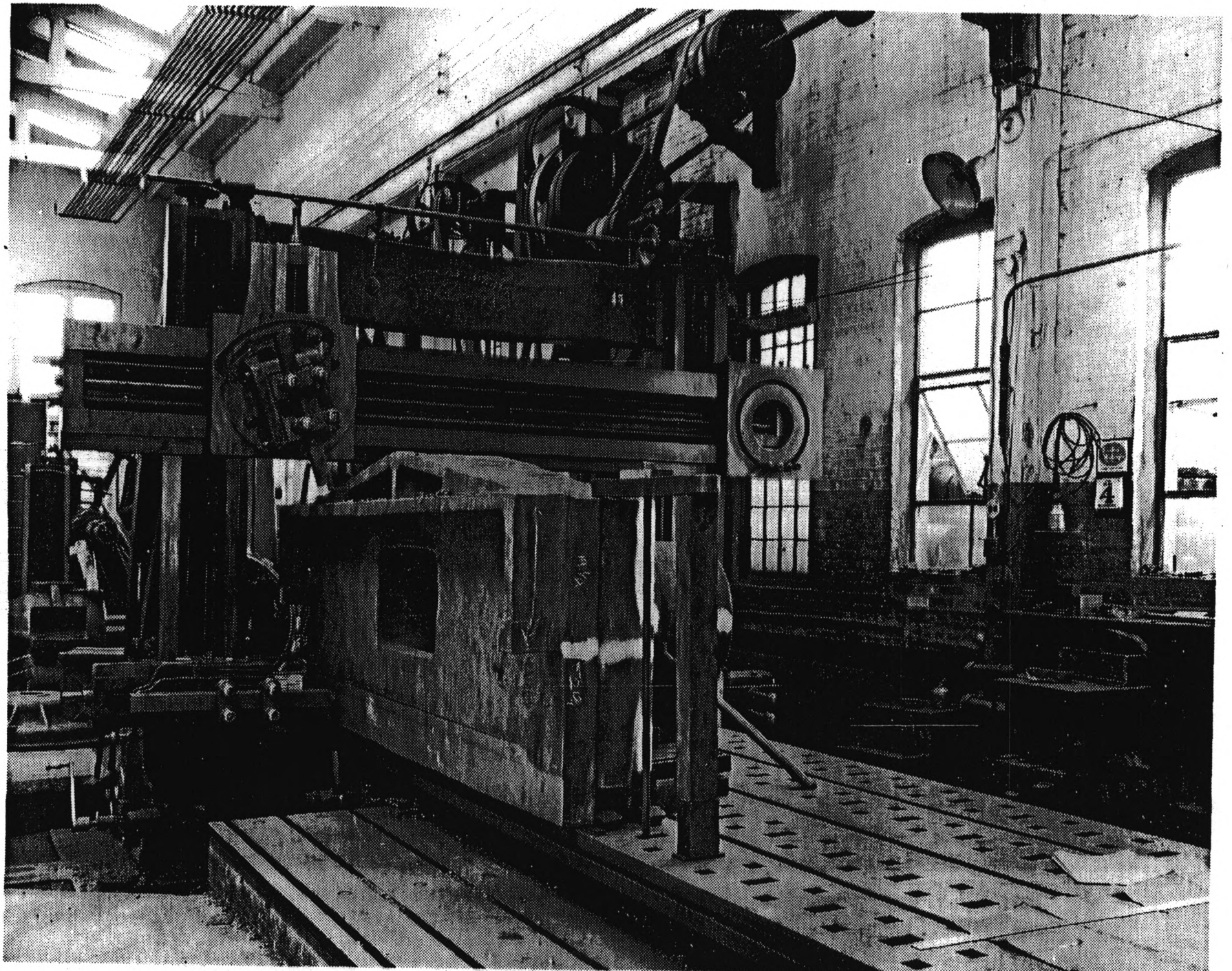
JIB CRANES - indicated by dotted circles and consisting of wood beams from which extend a horizontal arm or jib. On this, a trolley moves in a radial direction. Probably more than 100 years old.

SOURCES:

Mr. Chad Watts, Proprietor, Watts Campbell Company, Newark, New Jersey.

Audels Mechanical Dictionary, compiled by N. Hawkins, ME., (New York: Theo Audel and Company), 1942, (reprinted 1947).

Condensed Encyclopedia of Engineering, edited by Franklin D. Jones, (New York: The Industrial Press), 1928.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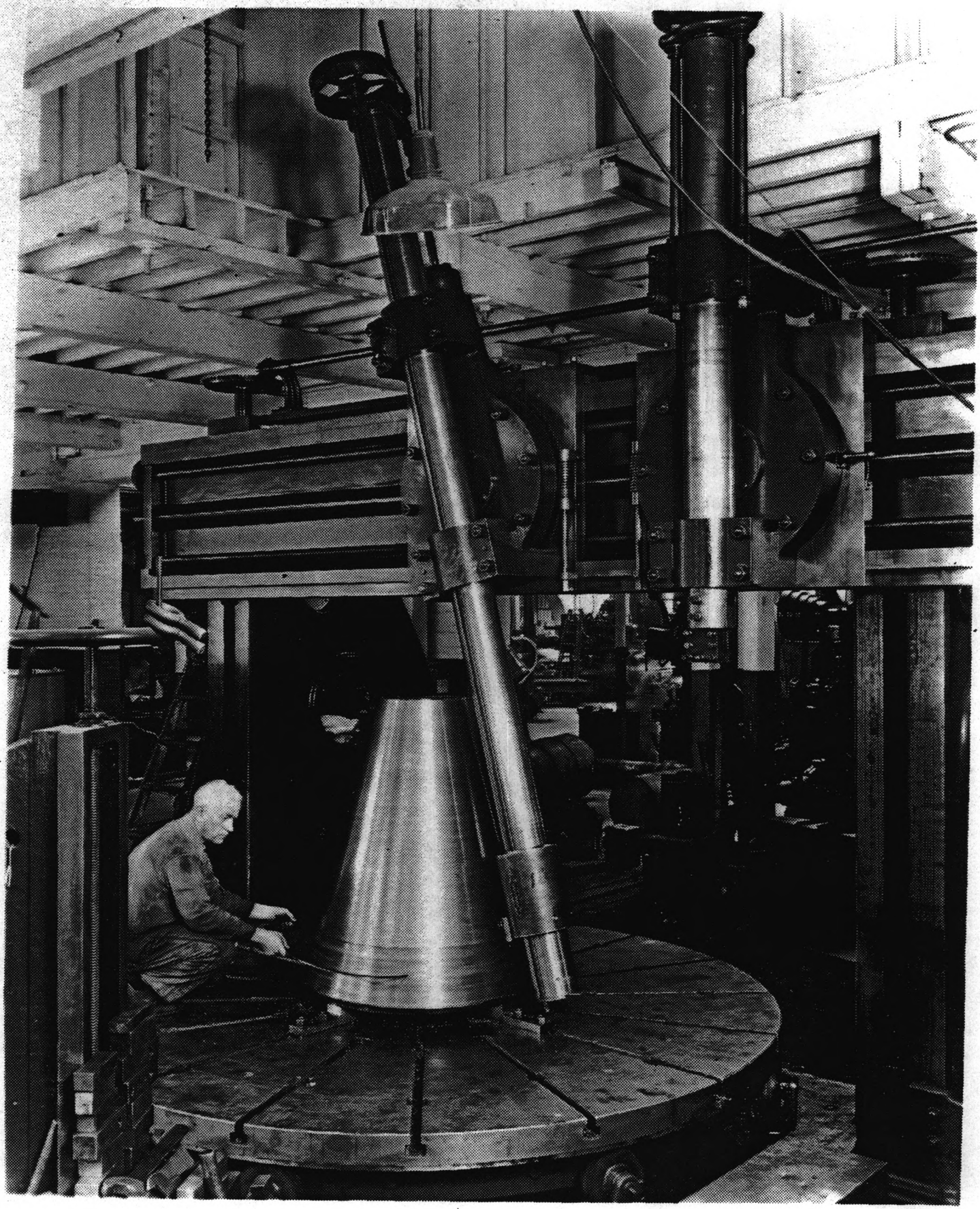

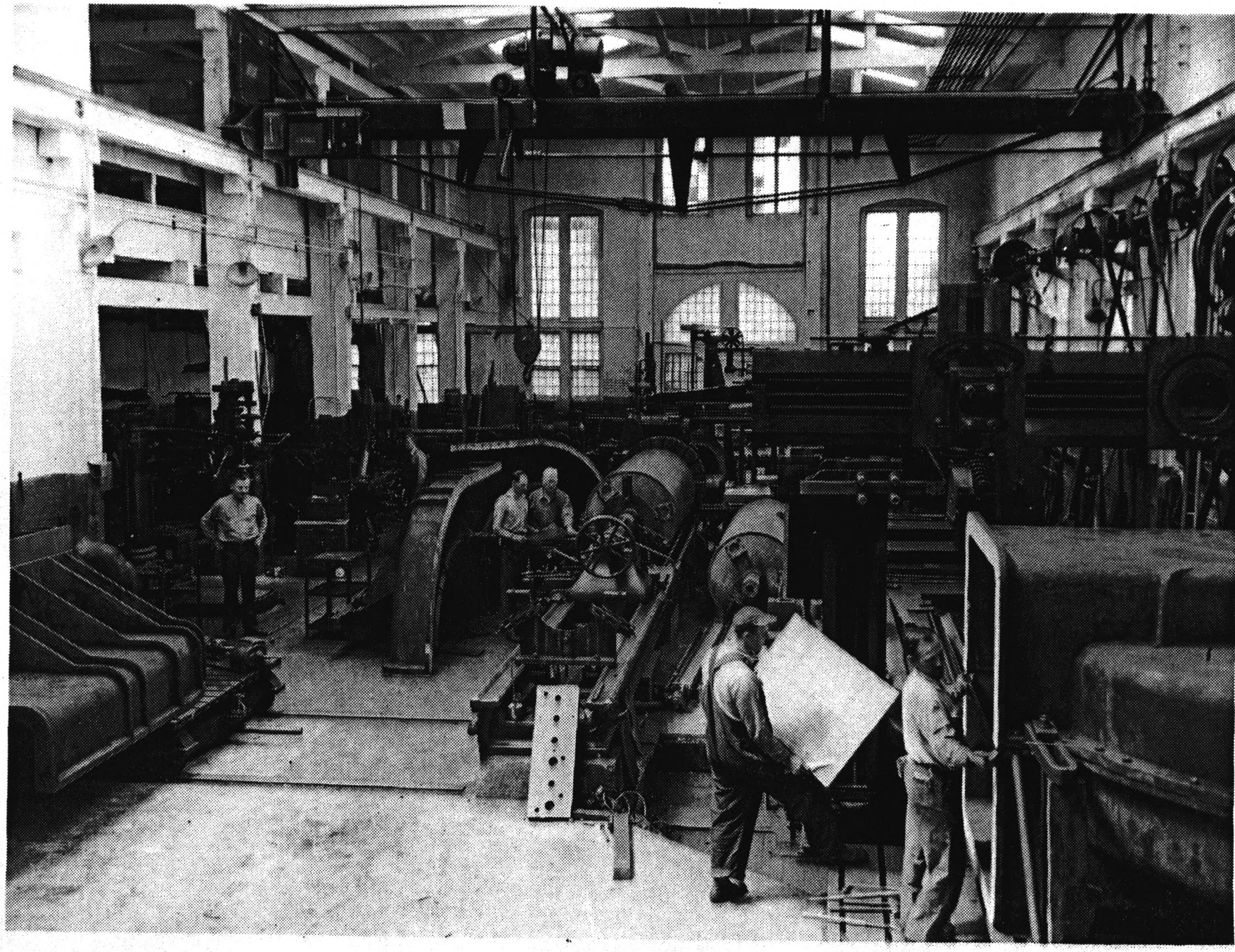

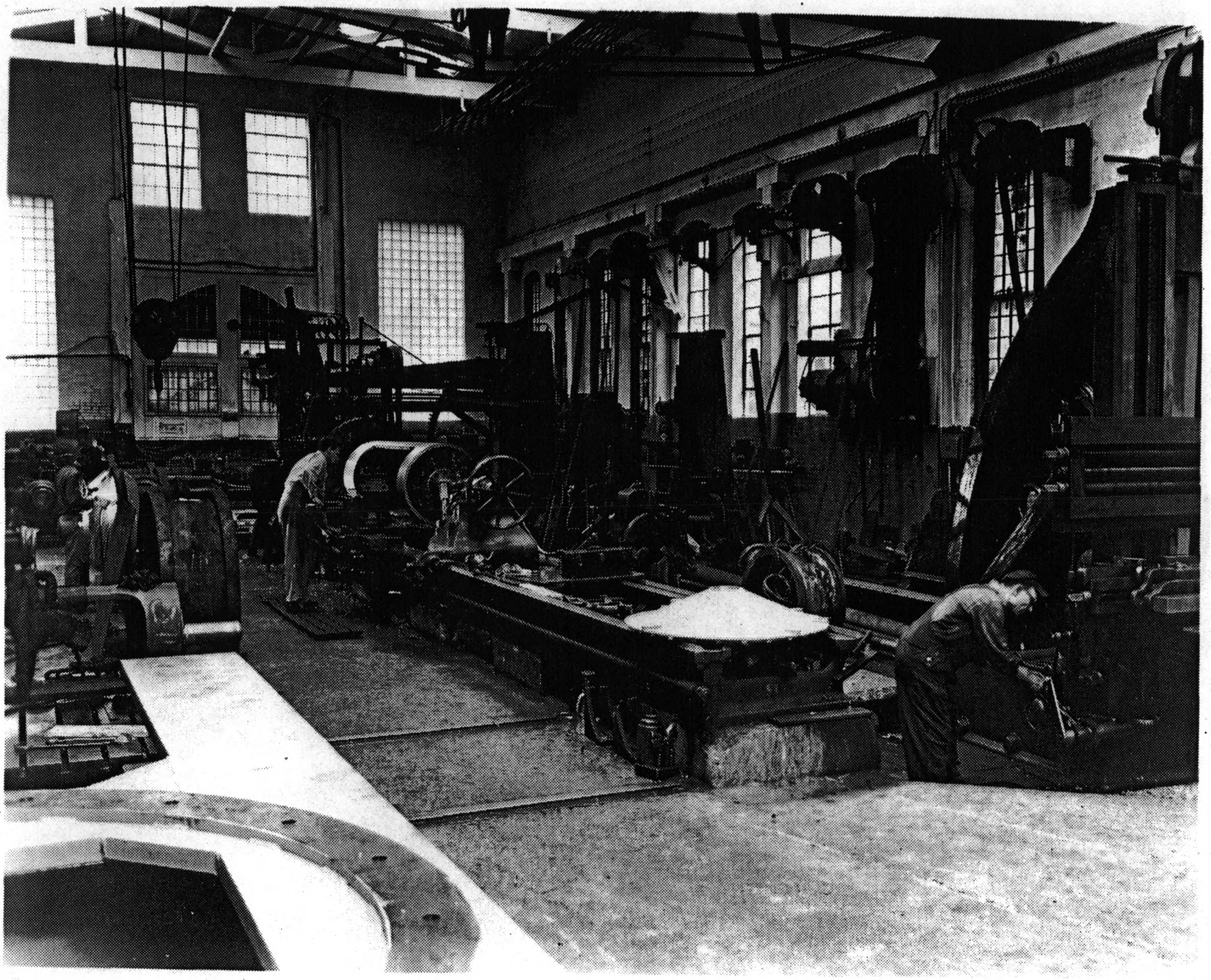

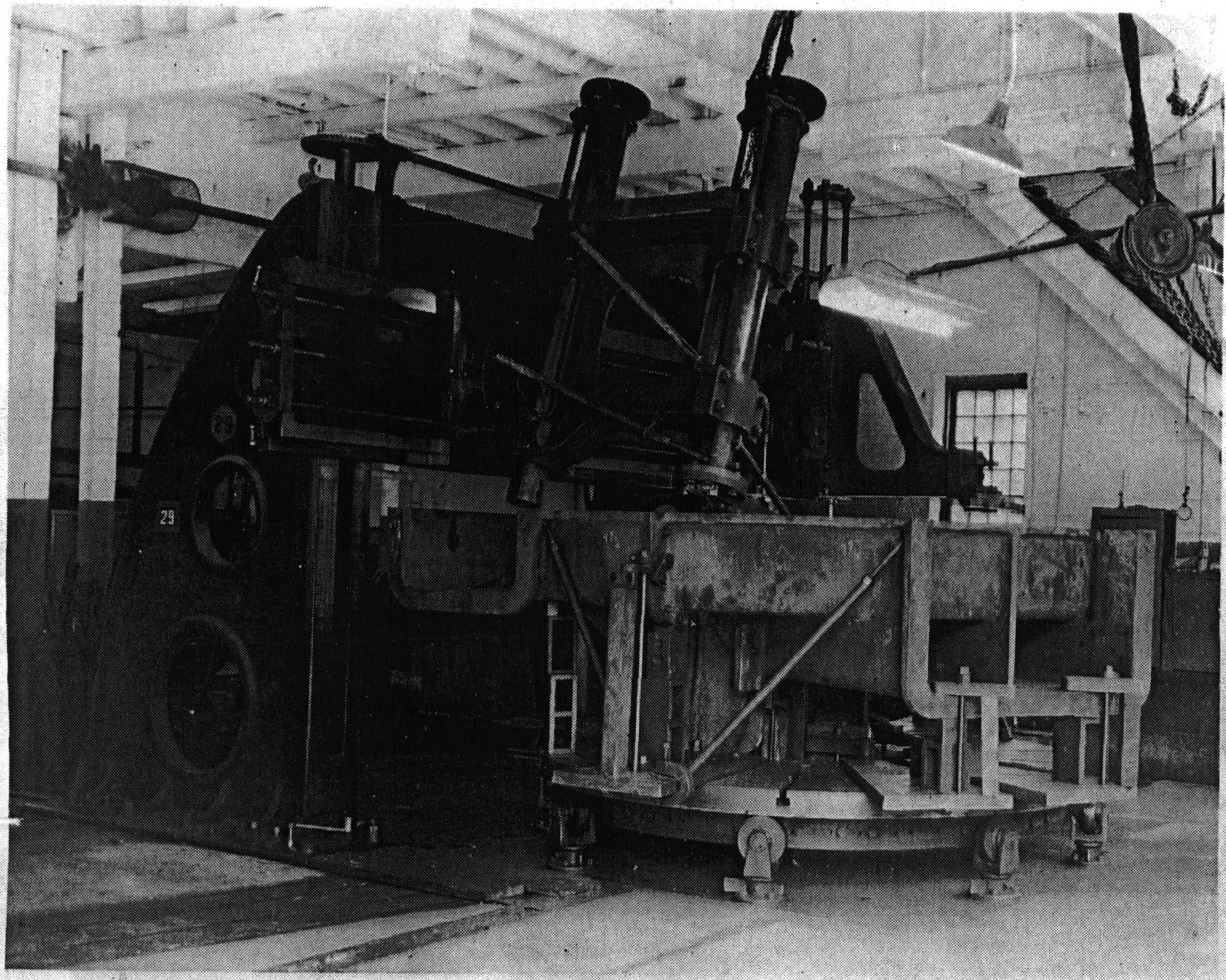
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