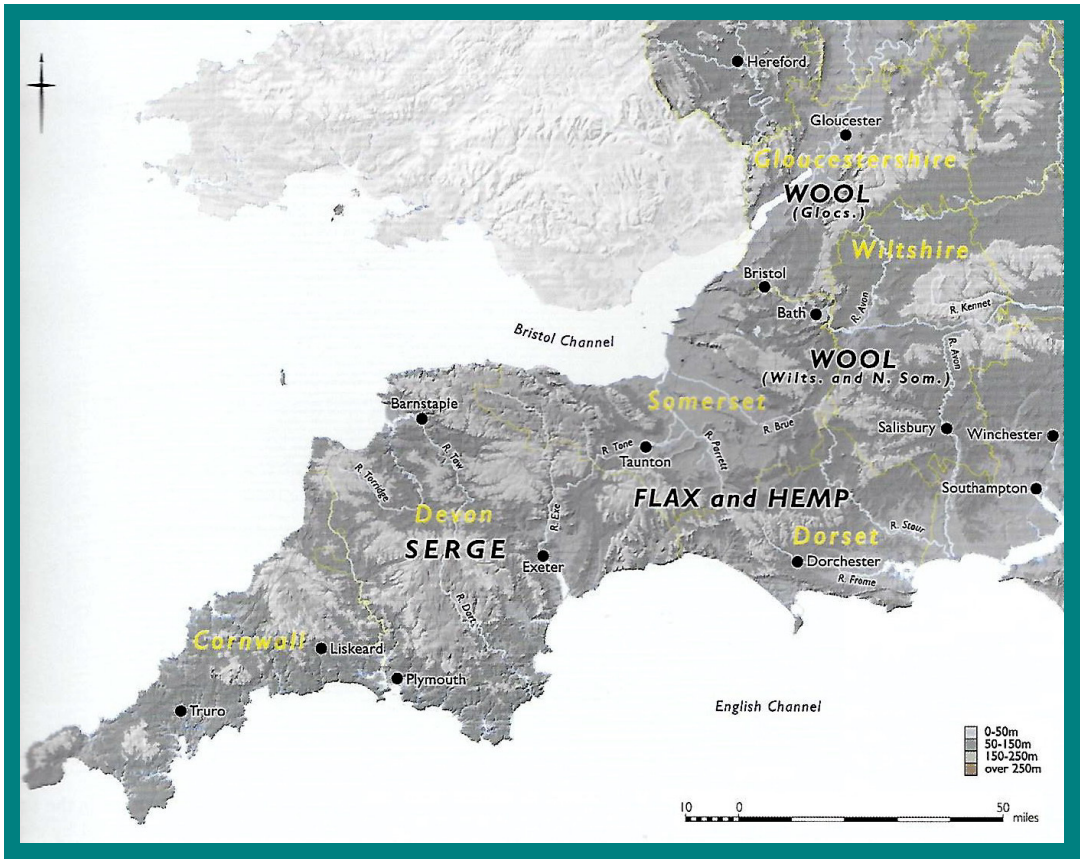


Historic Mills of South West England

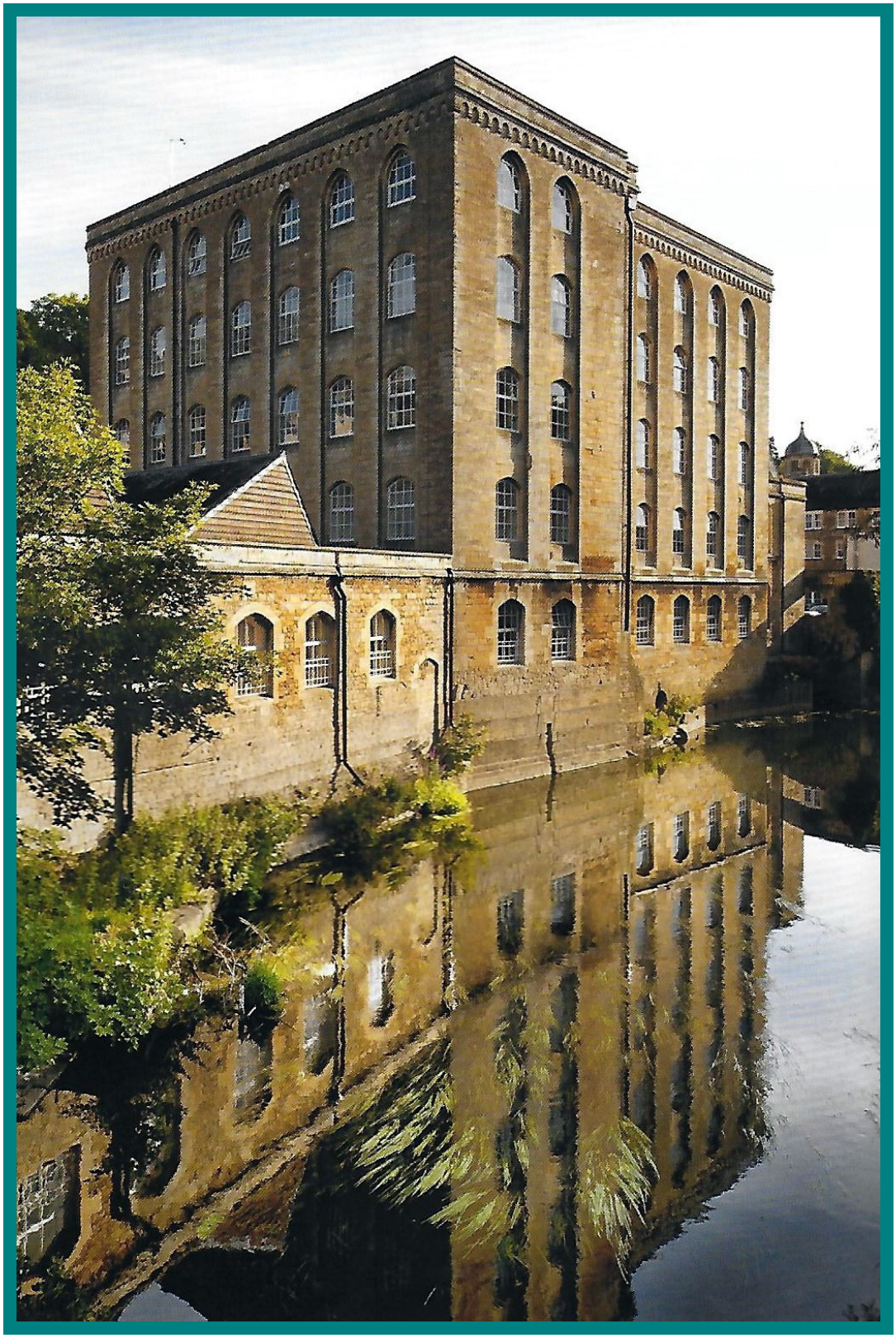
HISTORIC TEXTILE MILLS

ENGINEERING SERVICES: PART ONE

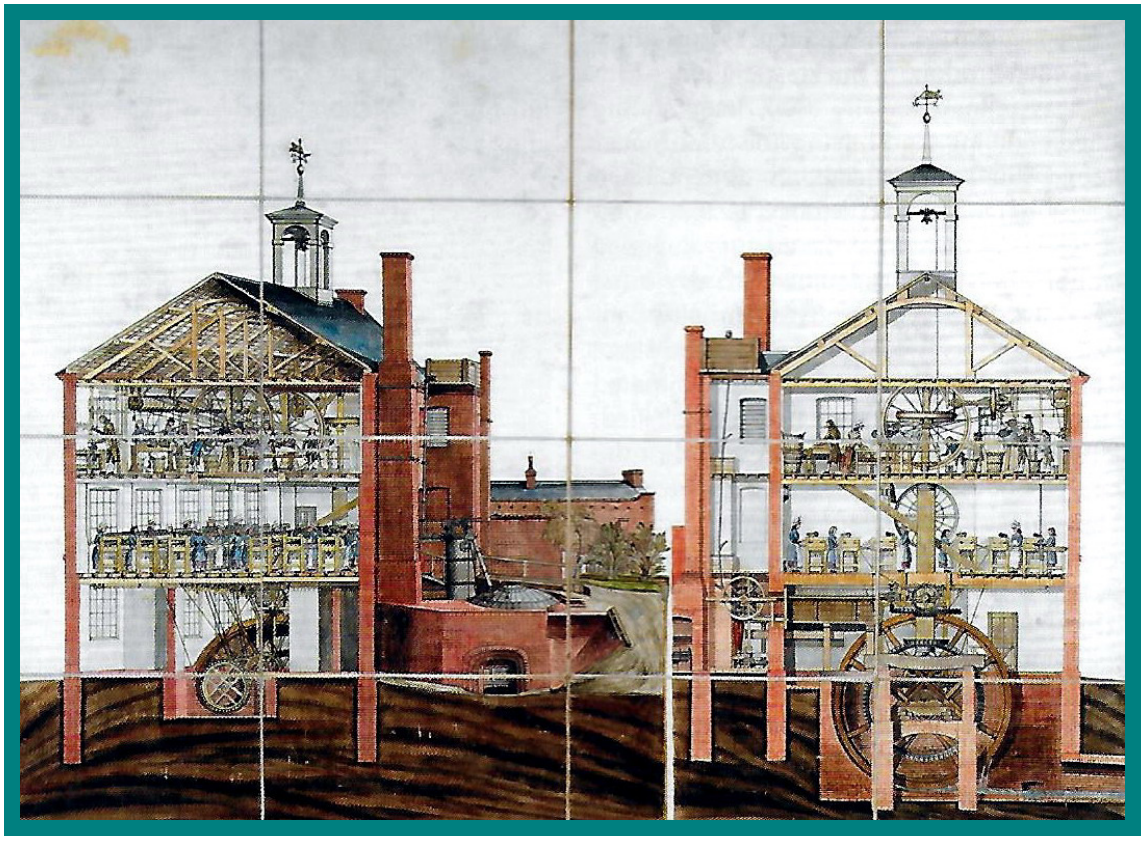
GREAT BRITAIN AND USA

BRIAN ROBERTS

ABBEY MILL, BRADFORD-ON-AVON
WILTSHIRE Late Nineteenth Century



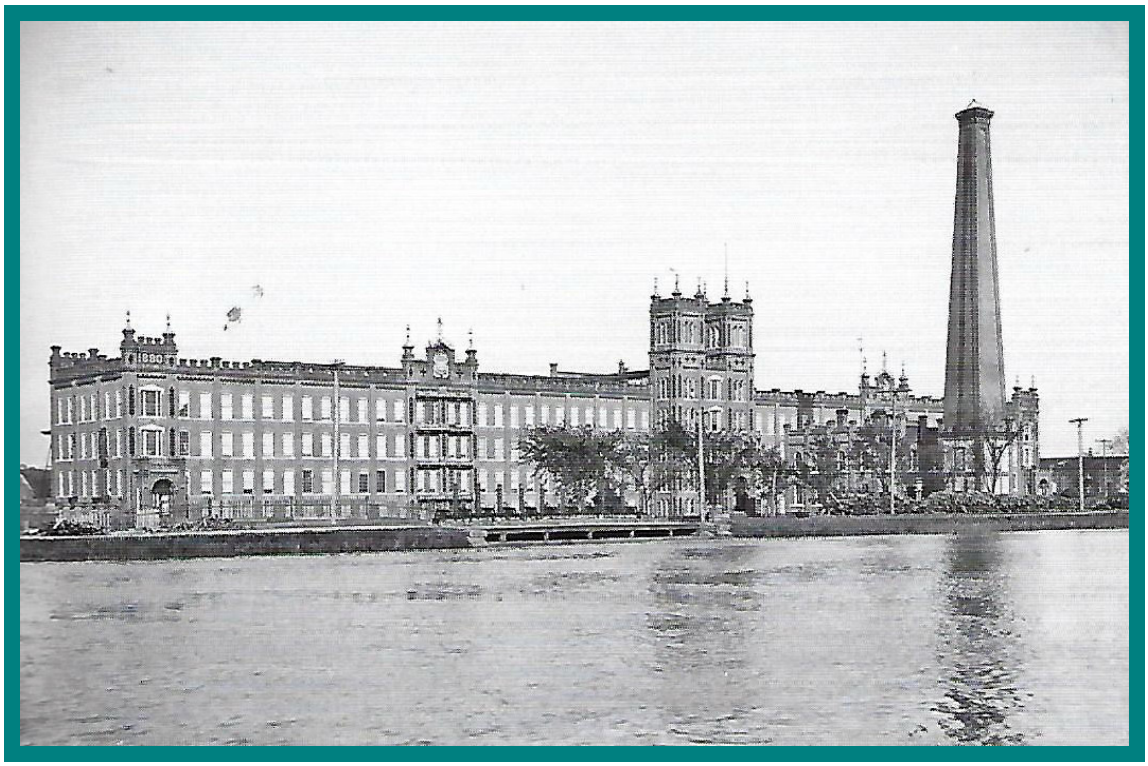
BEDWORTH MILL, WARWICKSHIRE 1791

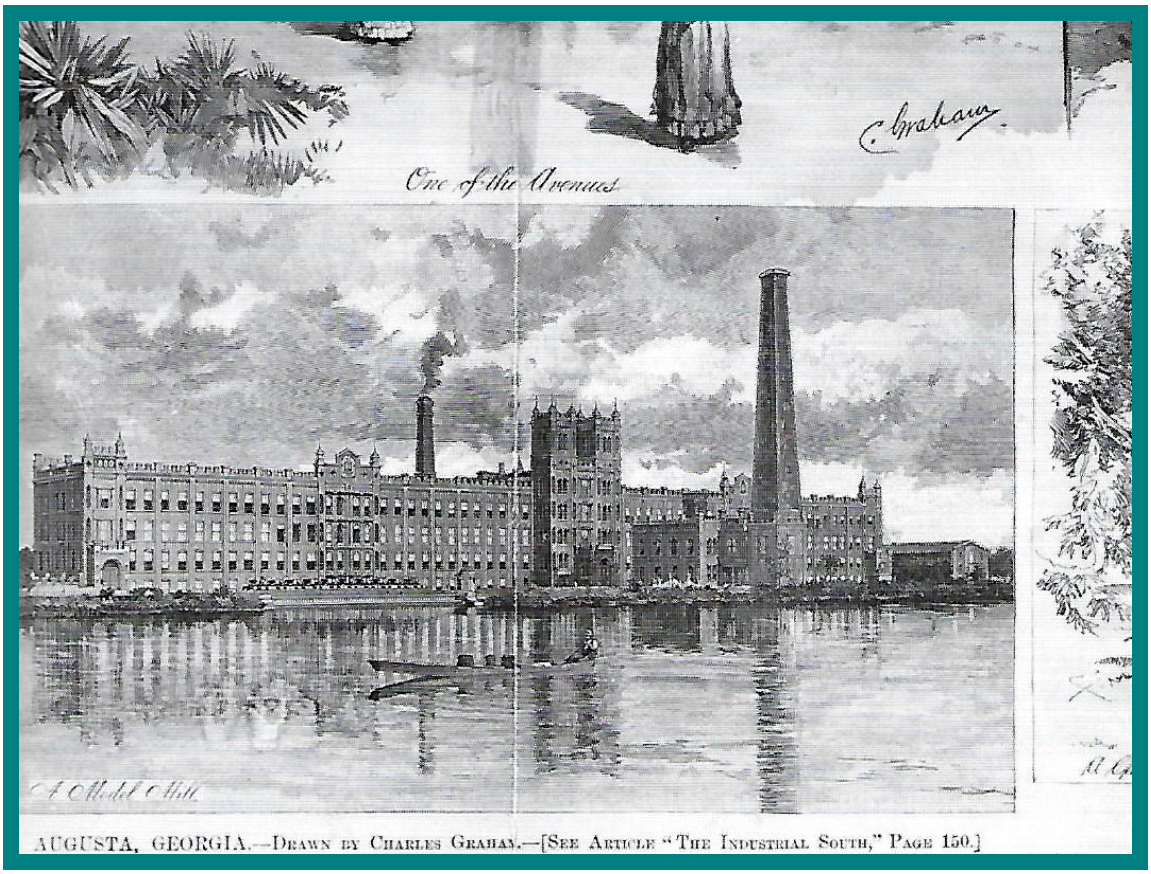


CONTENTS

BMR, Budleigh Salterton 2021.

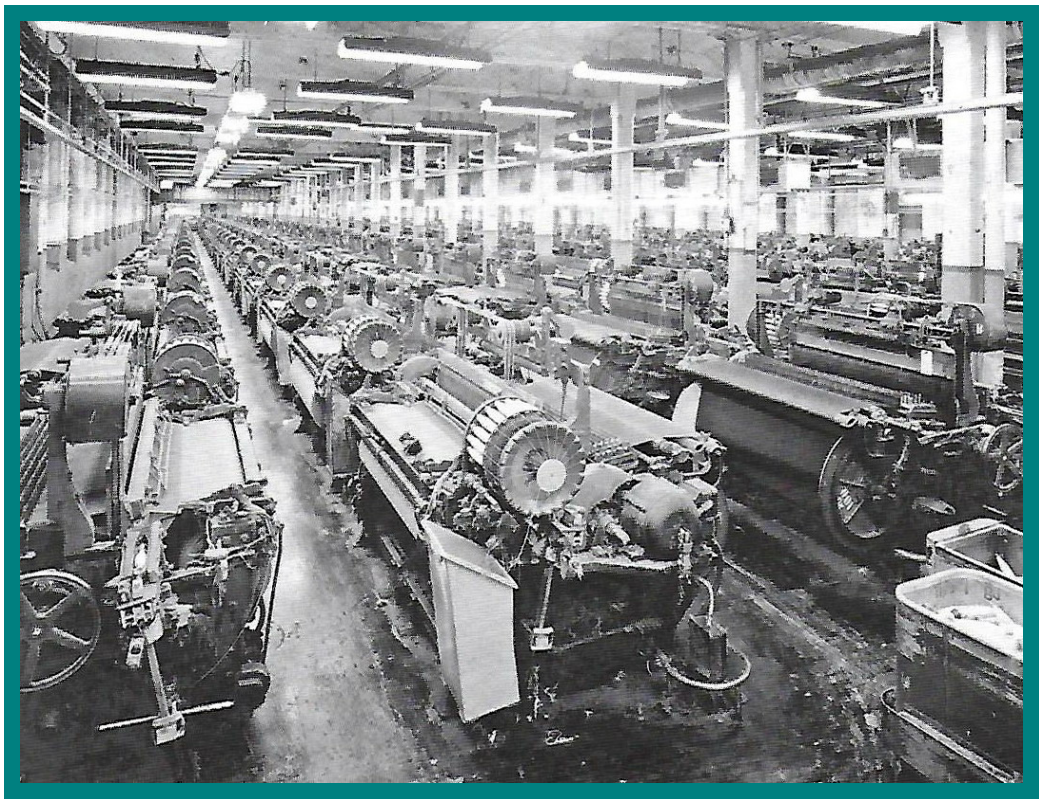
SIBLEY MILLS, AUGUSTA, GEORGIA 1880





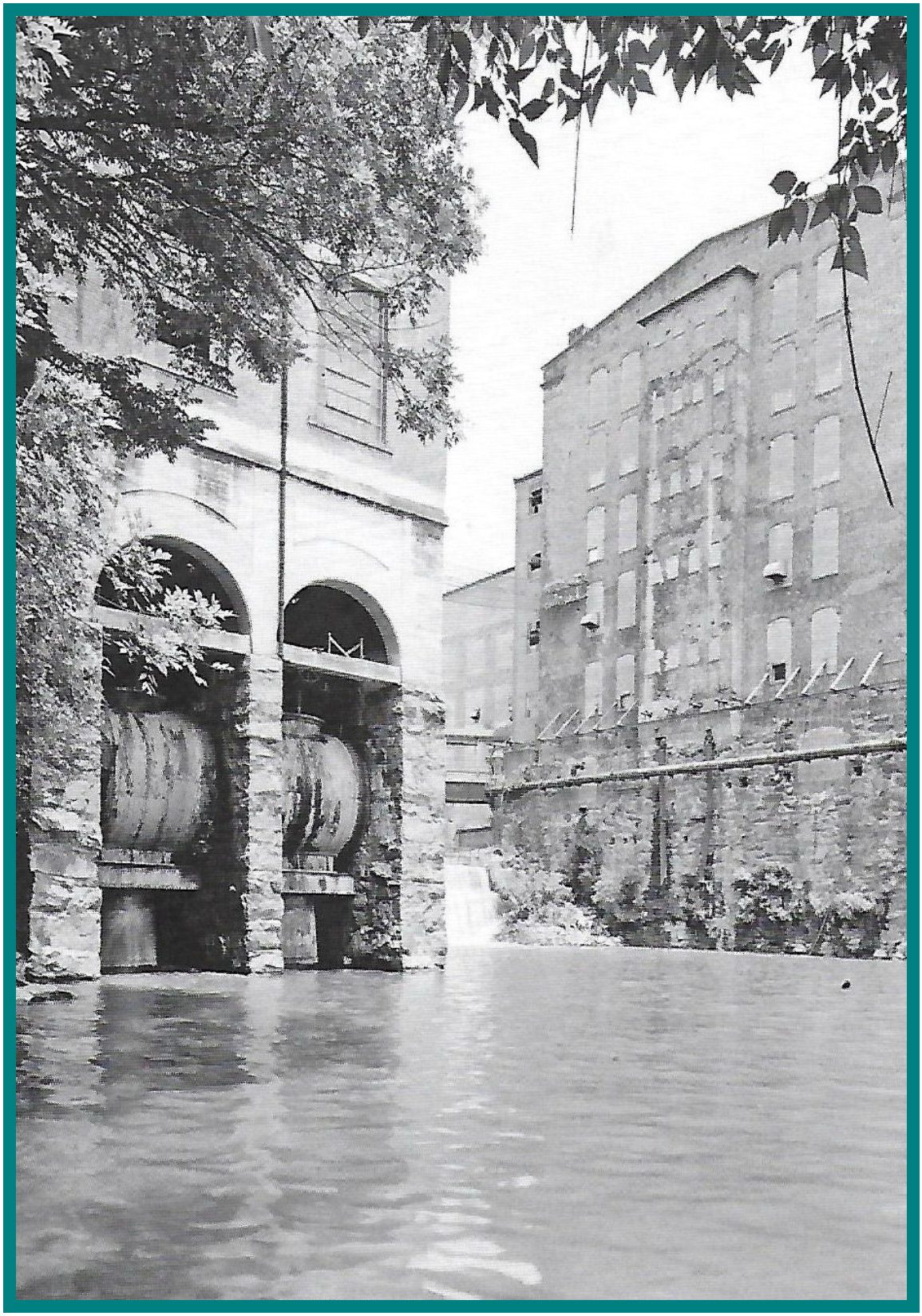
AUGUSTA, GEORGIA.—Drawn by Charles Graham.—[See Article "The Industrial South," Page 150.]

ENTERPRISE MILL ON AUGUSTA CANAL

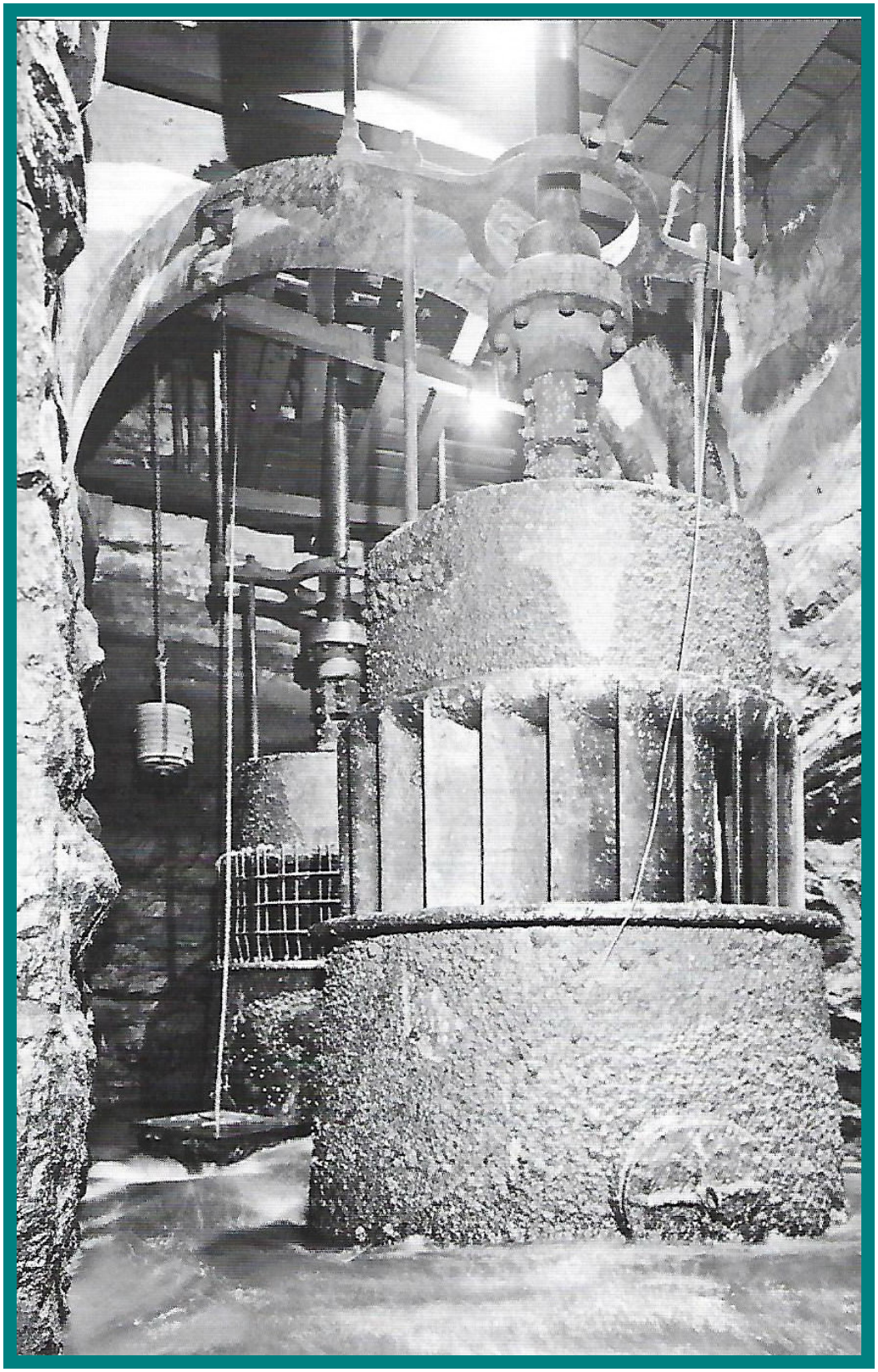


SAVANNAH RIVER COTTON EXCHANGE

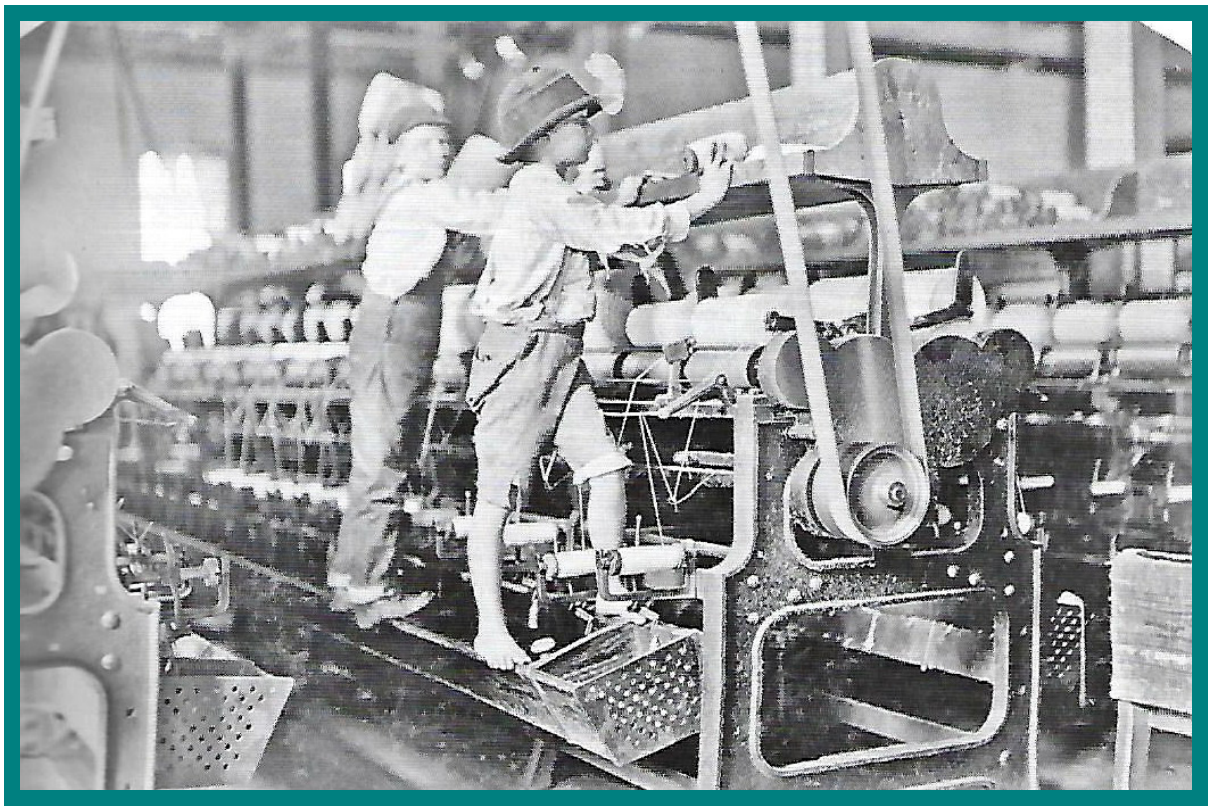
EAGLE & PHENIX HYDROPOWER PLANT
CHATTAHOOCHEE RIVER, COLUMBUS



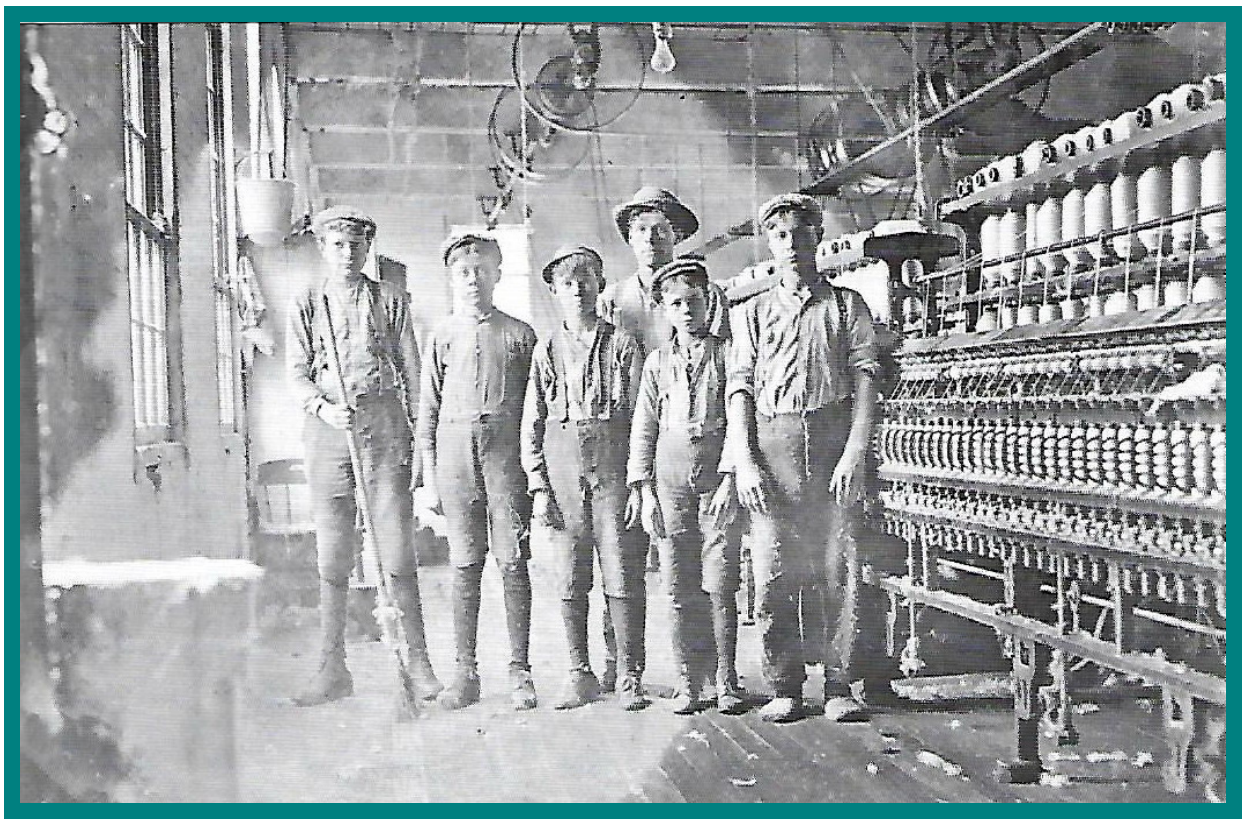
EAGLE & PHENIX MILLS
TURBINE FOR POWERING GENERATORS



BIBB MILL No.1, MACON, GEORGIA
CHILD LABOUR



GLOBE MILL, AUGUSTA
CHILD LABOUR



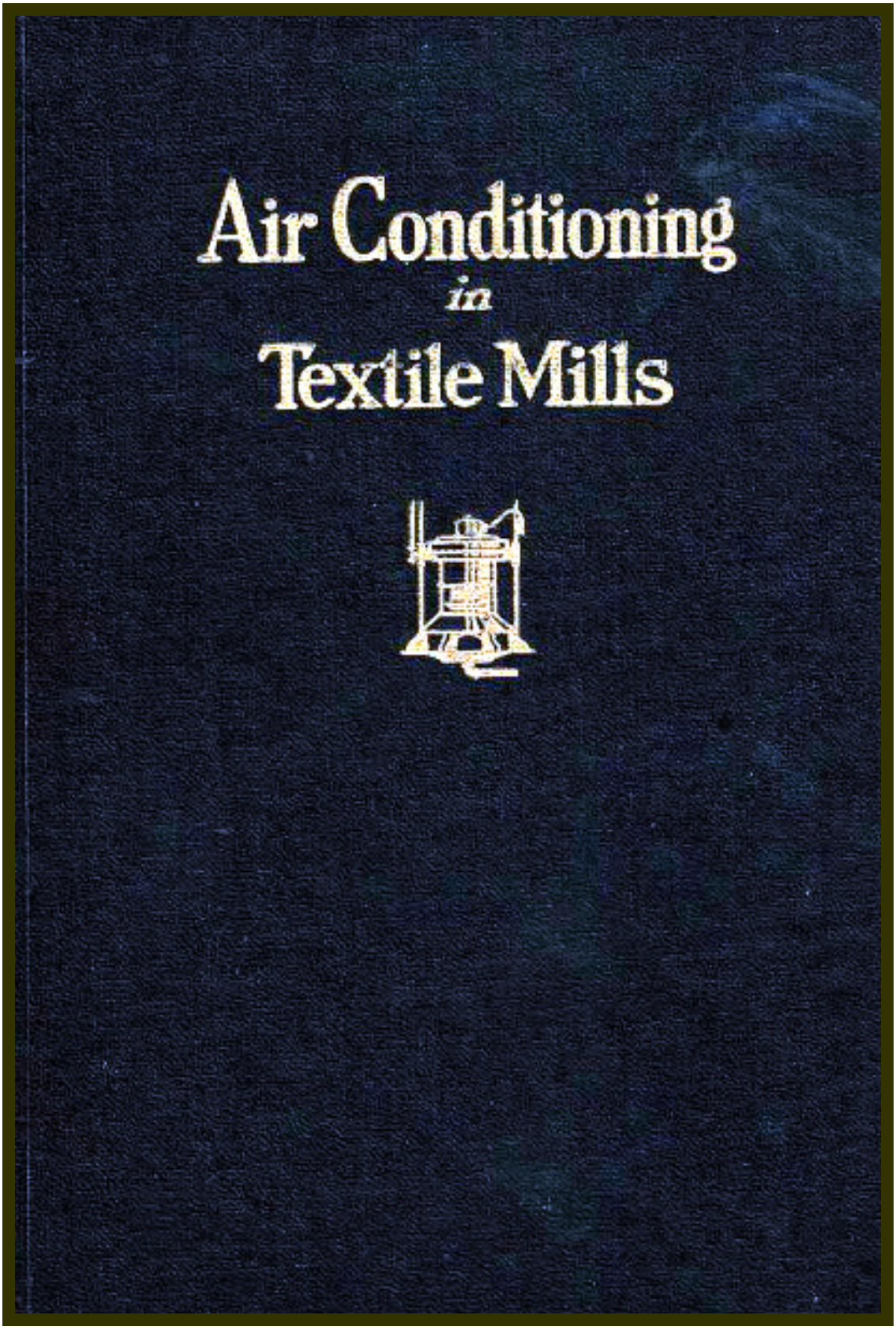
THE TERM AIR CONDITIONING 1906

SOME EARLY HISTORY

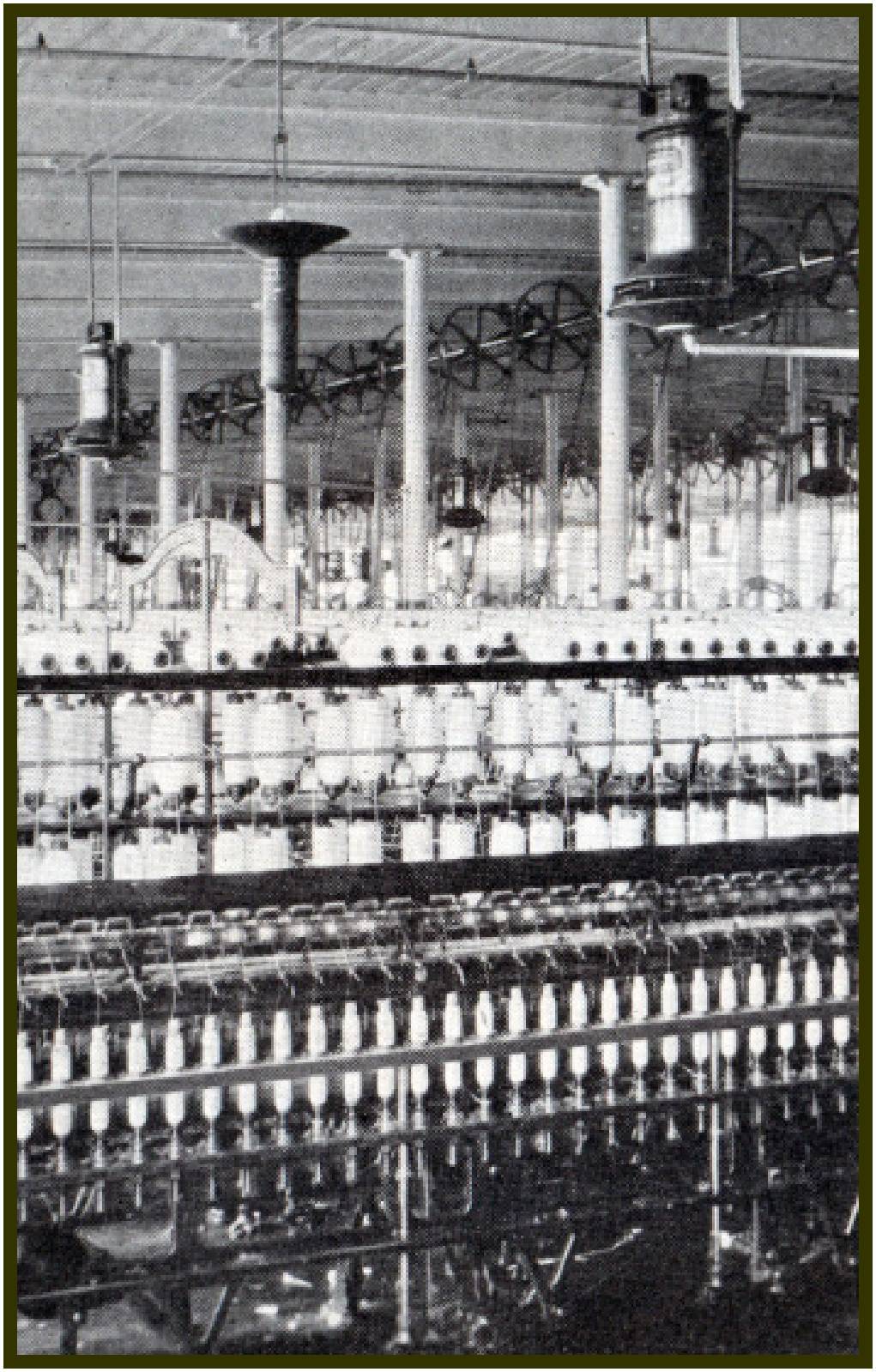
In 1904, Stuart W. Cramer, a prominent textile mill engineer of Charlotte, North Carolina, U.S.A. was engaged in designing and manufacturing humidification and air handling equipment for textile mills. This work was of a pioneering nature based on independent studies of the properties of air and moisture.

To describe the field in which he was working, Mr. Cramer originated the term "air conditioning." He formally introduced this term at a convention of the American Cotton Manufacturers Association in May 1906. In an address delivered before this convention, Cramer defined air conditioning to include humidifying with its resulting evaporative cooling, also air cleansing, heating, and ventilation.

PARKS-CRAMER, USA 1924

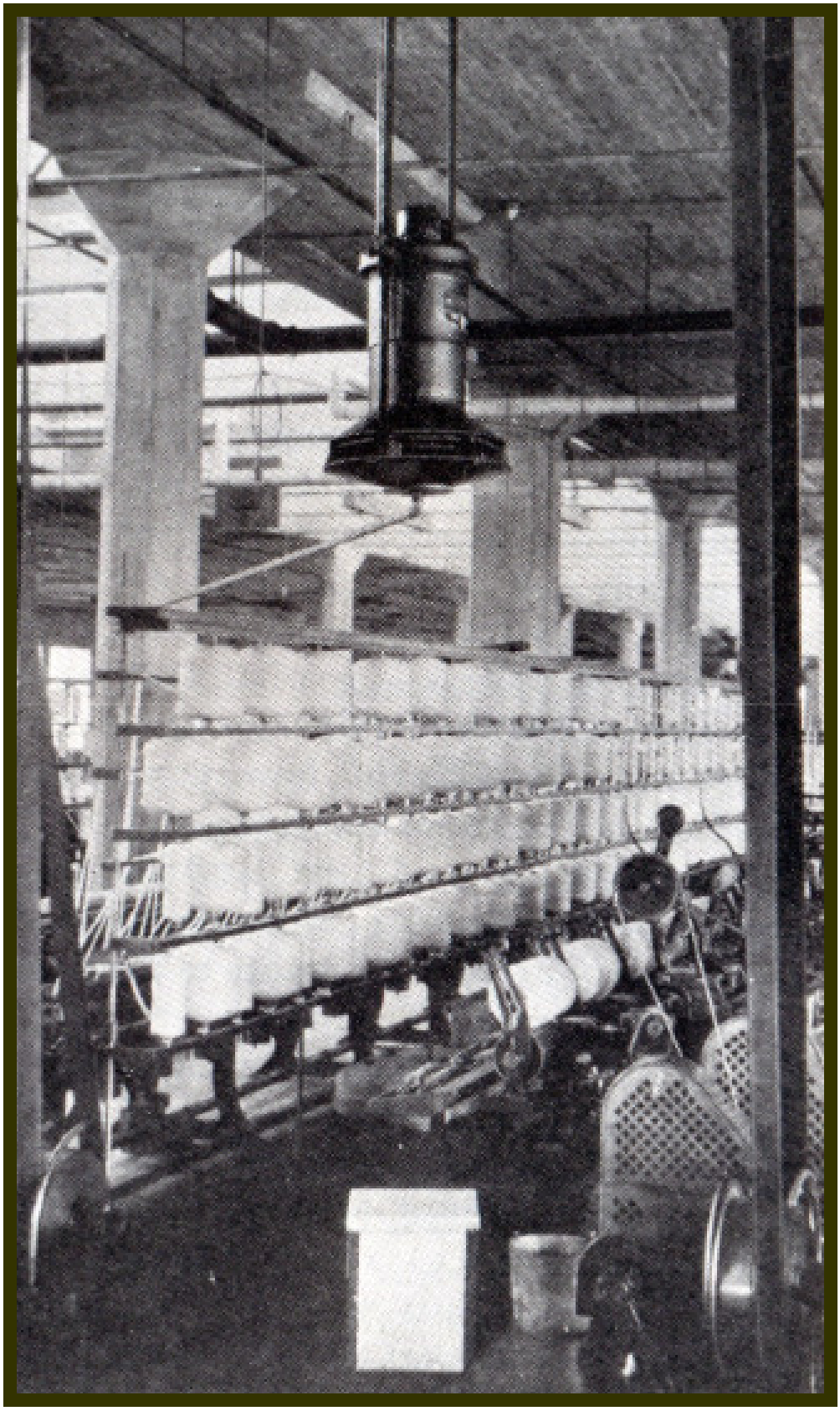


COTTON RING SPINNING HUMIDIFIERS



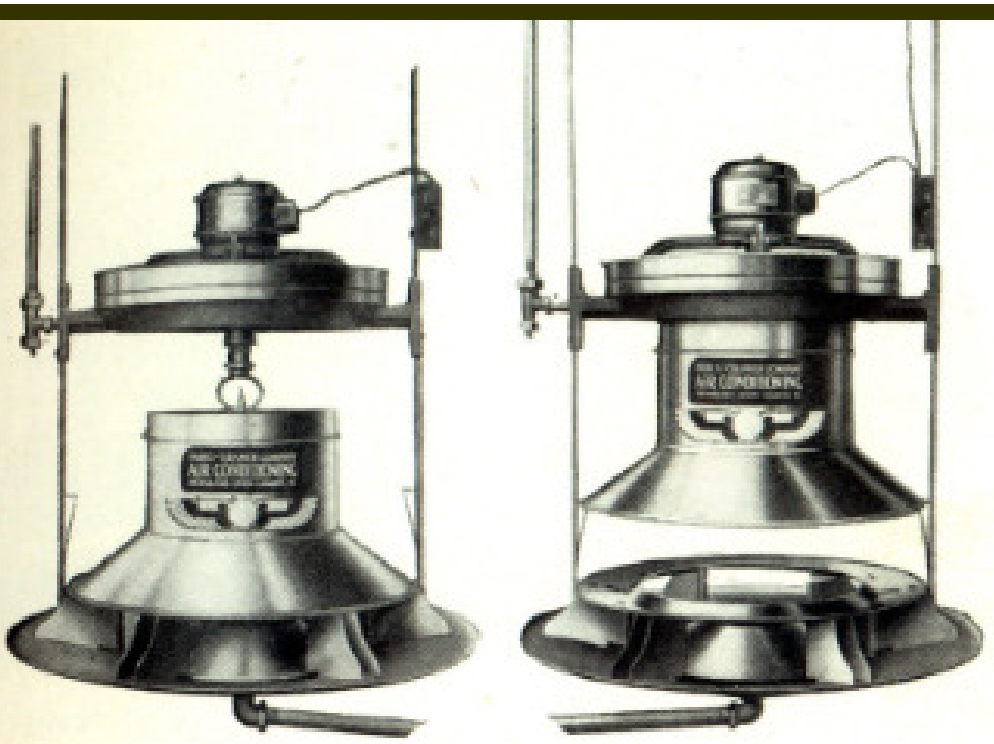
Parks-Cramer.

PORCUPINE DRAWING HUMIDIFIERS



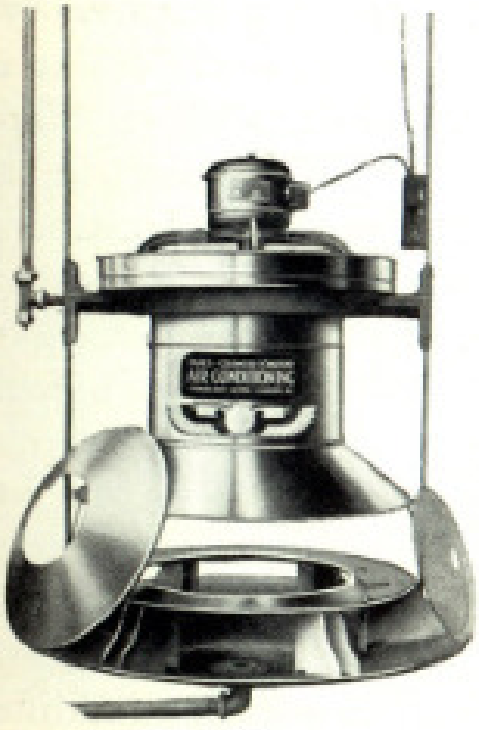
Parks-Cramer.

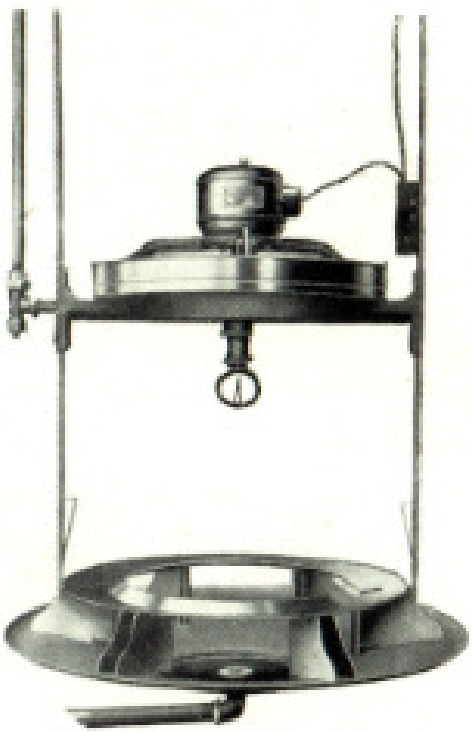
HUMIDIFIERS OPEN FOR CLEANING



Upper casing lowered.

Lower casing raised.





Parks-Cramer.

COTTON DRAWING HUMIDIFIERS

Parks-Cramer.

AIR WASHERS AND HUMIDIFIERS

Catalog 13

Carrier Air Washers *and* Humidifiers

Applied to Public Office and Industrial Buildings

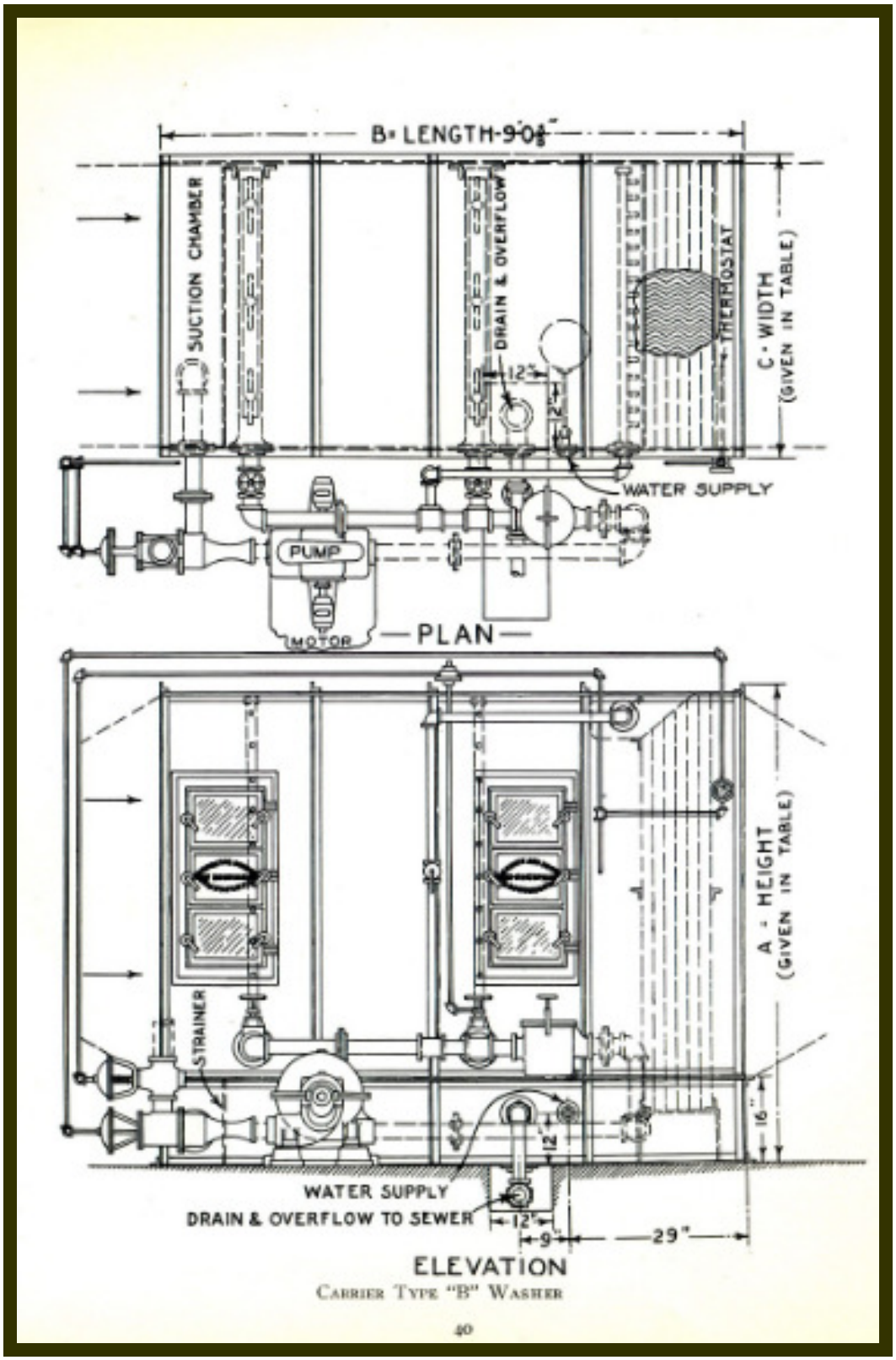
With Notes on Humidity

Patented in the United States
Canada and Foreign Countries

Carrier Air Conditioning Company
of America
39 Cortlandt Street, New York, N. Y.

1913.

AIR WASHER WITH TWO SPRAY BANKS



Carrier 1913.

TEXTILE MILLS HUMIDIFYING

Carrier Engineering Corporation

Carrier AIR CONDITIONING AND DRYING EQUIPMENT

Humidifying, Dehumidifying, Cooling, Drying, Air Washing, Automatic Temperature and Humidity Regulation

Carrier AIR CONDITIONING AND DRYING EQUIPMENT

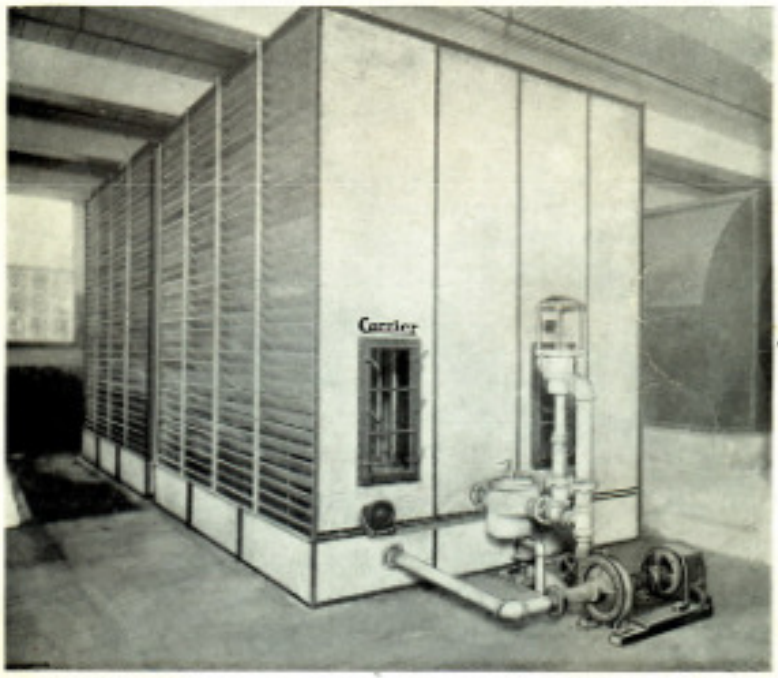
39 Cortlandt Street, New York

BOSTON, MASS 176 Federal St. | PHILADELPHIA Land Title Bldg. | BUFFALO, N. Y. Mutual Life Bldg. | CHICAGO, ILL. Transportation Bldg.

Bulletin No. 103

The

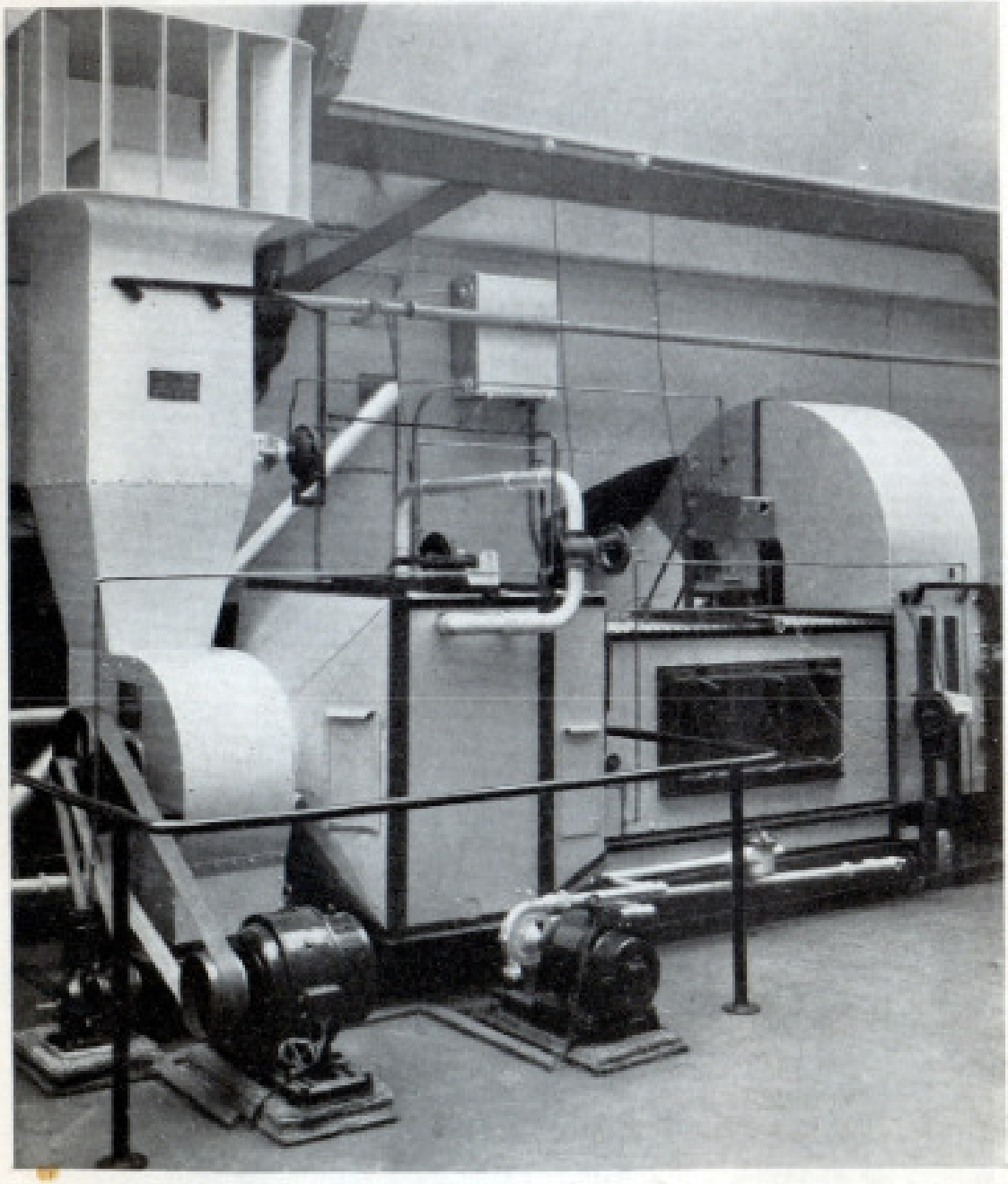
Carrier System of Humidifying as applied to textile mills



Typical Carrier Humidifier with automatic temperature and humidity control. This installation serves the largest alpaca mill in the United States and one in which worsted dress goods and coat linings of the highest quality are made. Farr Alpaca Company, Holyoke, Mass.

1916.

TEXTILE AIR CONDITIONING



Carrier Equipment in the Chamber of Commerce Testing House, Manchester, England. This is the foremost conditioning house in the textile industry and has adopted the Carrier System in preference to all other American and European apparatus.

TEXTILE MILL AIR CONDITIONING

Carrier Engineering Company Ltd.

AIR CONDITIONING IN THE BRITISH TEXTILE MILLS

The old time supremacy of England as a textile nation was due principally to the fact that her climate is moderate, moist, and naturally well-suited to textile manufacture.

In the early days, when the industry was young, most of the machines were driven by hand or foot power, and even when steam power first came into use the machinery was scattered over comparatively large floor areas, so that its mechanical heat was quickly absorbed by the large volume of surrounding air. Today, when textile machinery, running at tremendous speed, is grouped closely on the floor, the mechanical heat is so great that some artificial means of absorbing it must be provided, even in England, in fact, everywhere, because no suitable natural atmospheric condition exists anywhere in the world. The modern mill presents a more complex problem in air conditioning because it produces over a hundred times more yarn or cloth per square foot of floor area, than the early mills.

The pioneer textile manufacturer had to select his mill site with careful regard to climatic conditions, oftentimes sacrificing other advantages to this then essential consideration.

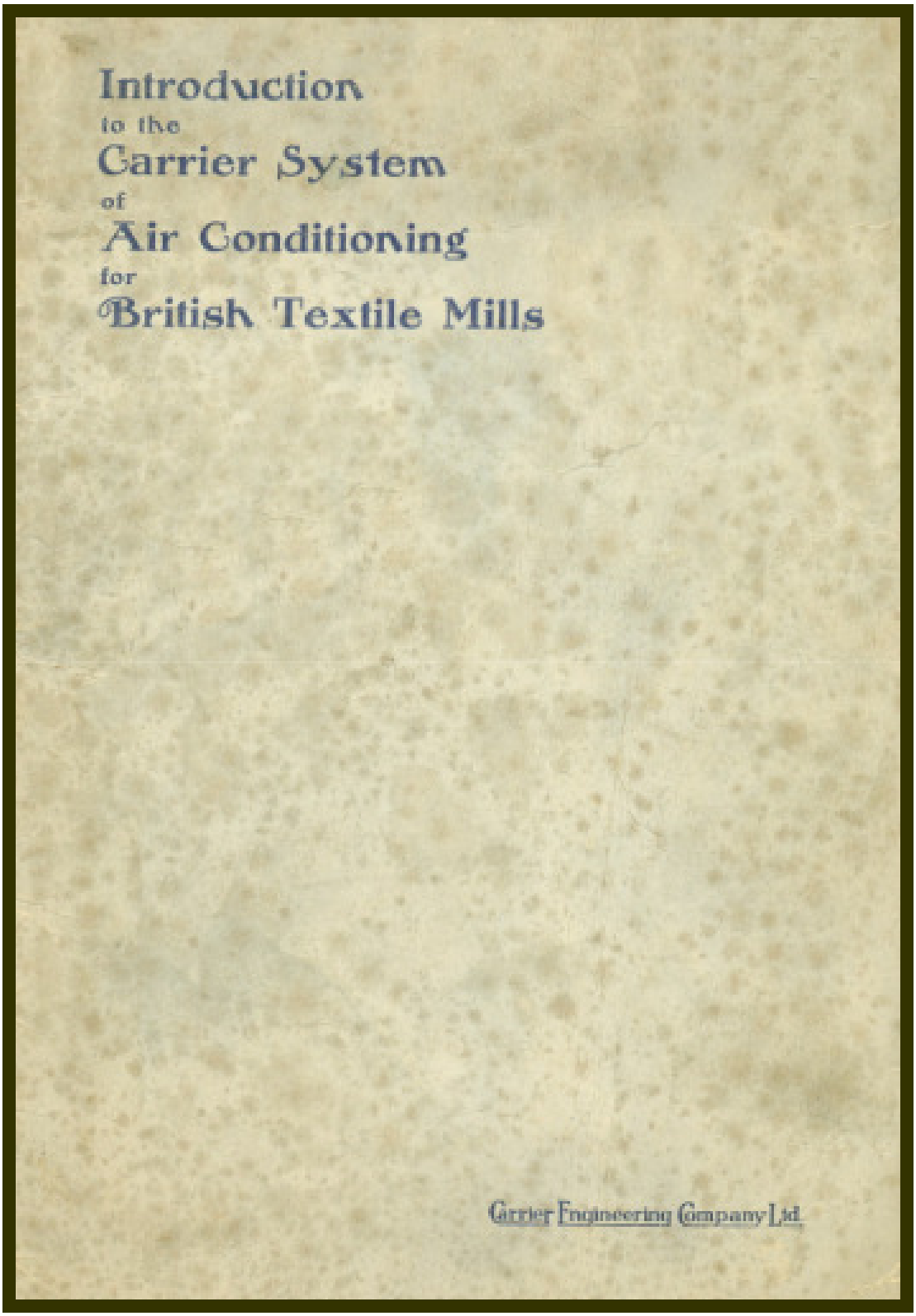
The considerations which guide the manufacturer of today in the location of his mill, should be entirely independent of climate. The modern manufacturer manufactures his own weather, to order.

Take, for instance, a spinning room, 300 ft. long by 100 ft. wide, in which 500 H. P. is used to drive the spindles. The law of Conservation of Energy tells us that we cannot destroy energy, but can only convert it from one form into another. Therefore all of the energy represented by this horse power does not disappear but is dissipated into the mill as heat, being equivalent to 1,270,000 British Thermal Units per hour, which is more than enough to maintain the temperature of the spinning room in the coldest weather.

Take the aforementioned spinning mill as an example, with the following outside conditions:

55 deg. F. dry bulb temperature and 52 deg. F. wet bulb temperature, giving a Relative Humidity of 80%.

TEXTILE AIR CONDITIONING BROCHURE



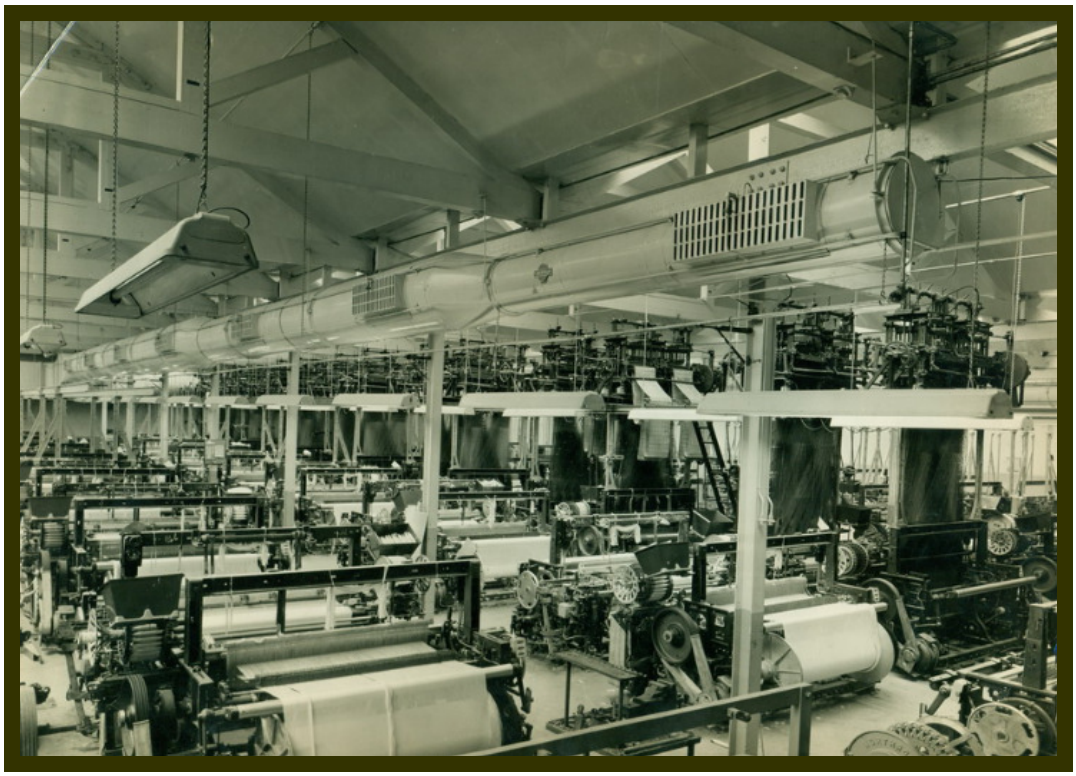
1925.

TEXTILE MILL AIR CONDITIONING

Rhodes No.1 Weaving Shed, Middleton Mill, Lancashire c.1950.

Stanhill Ring Mill c.1950.

TEXTILE MILL AIR CONDITIONING



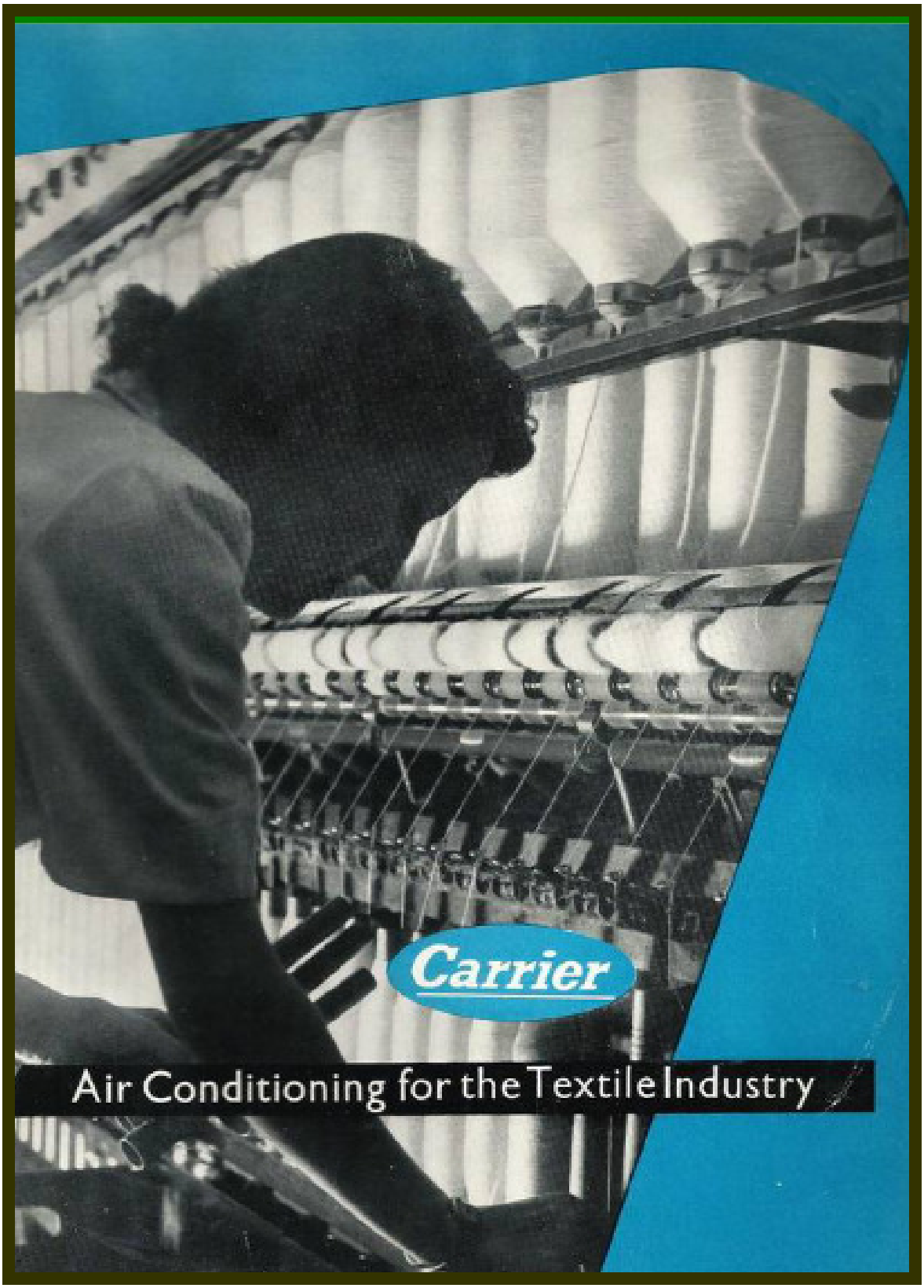
Weaving Shed No.2 Mill, Rock Nook 1949.

Weaving Shed, Waterside Mill 1950.

TEXTILE MILL AIR CONDITIONING

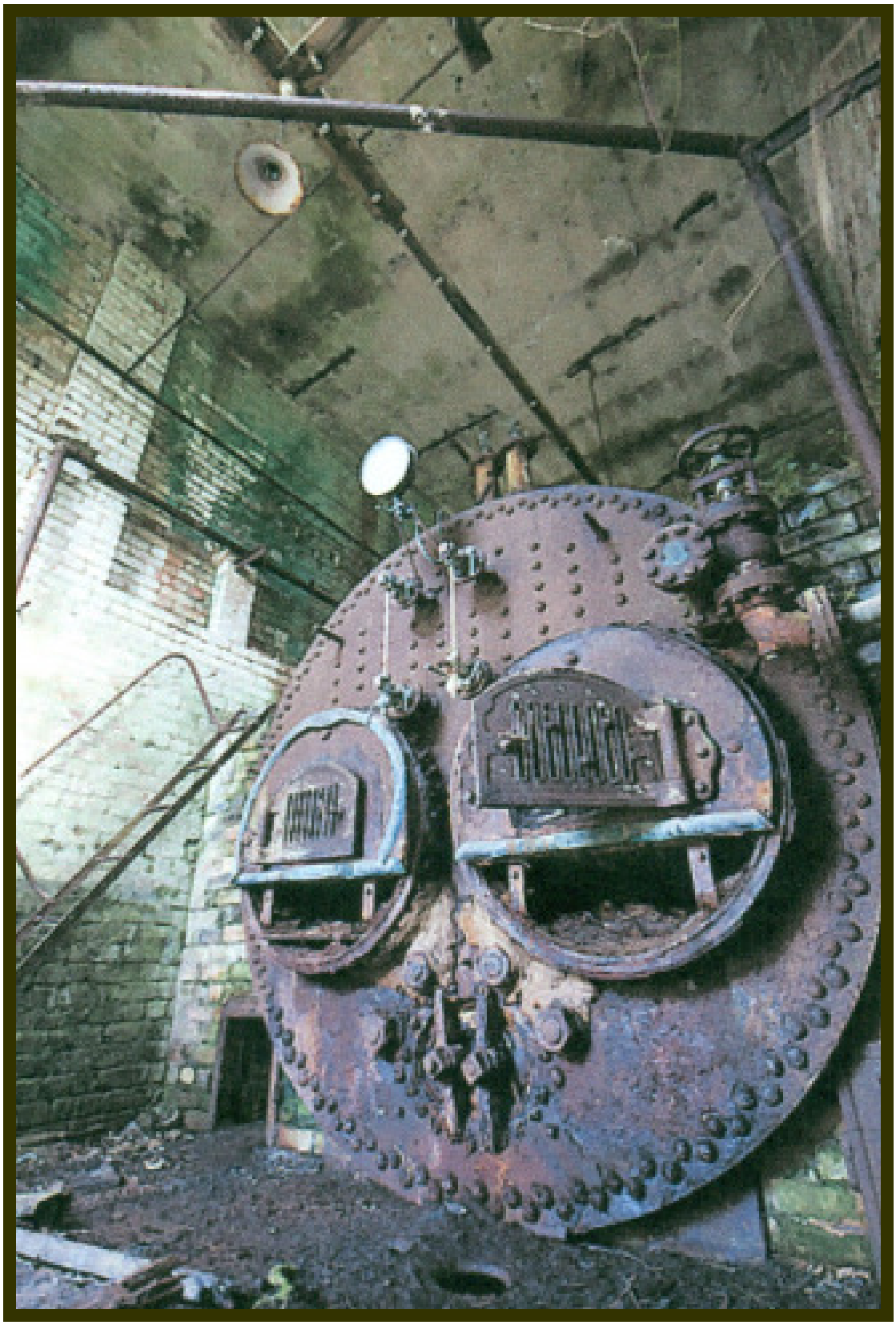
Air conditioning system mixing dampers, Bedford Mill Weaving Shed 1949.

TEXTILE AIR CONDITIONING BROCHURE



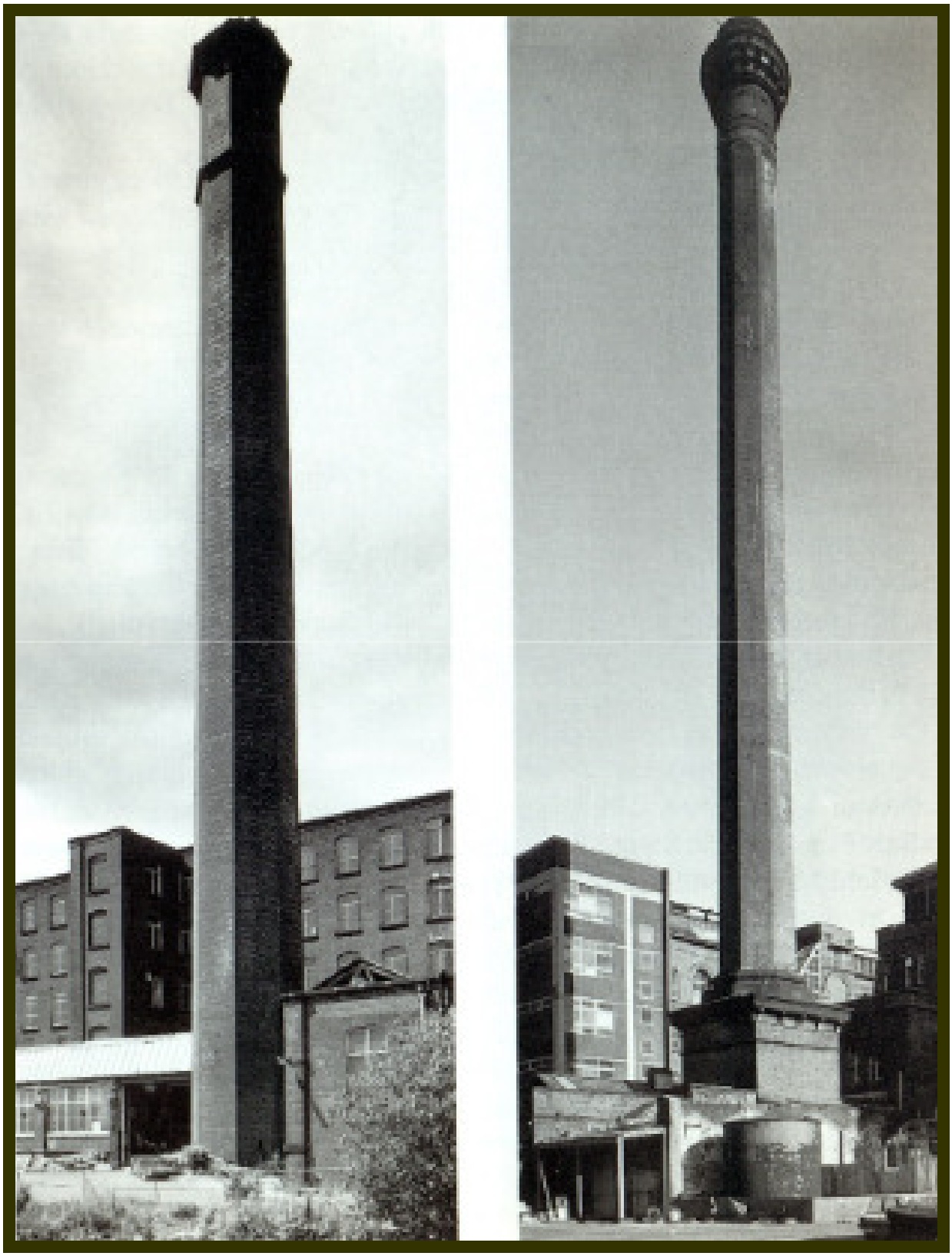
Probably 1950s.

FLAX MILL REDUNDANT STEAM BOILER



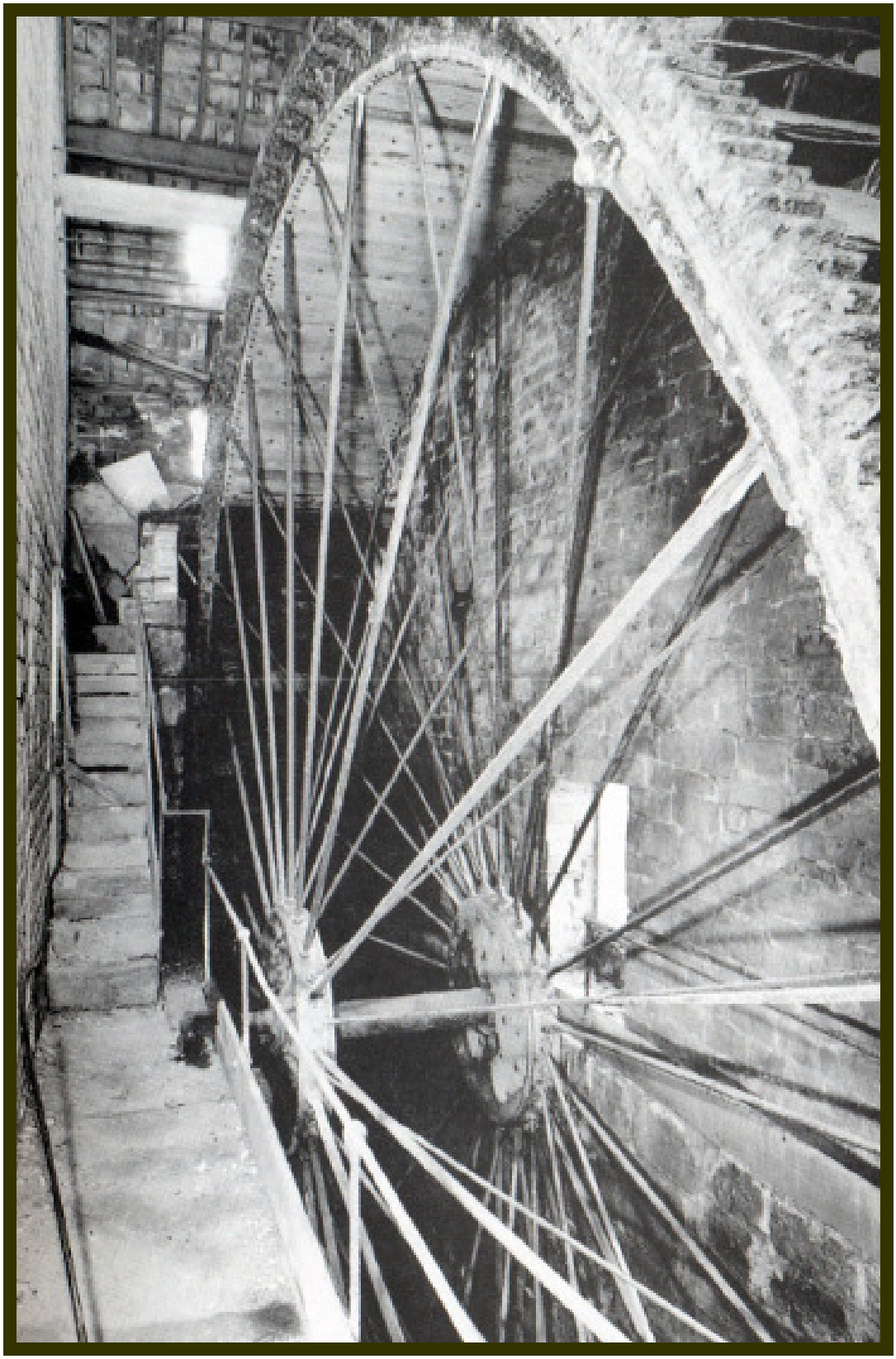
Place and date unknown.

TEXTILE MILL CHIMNEYS



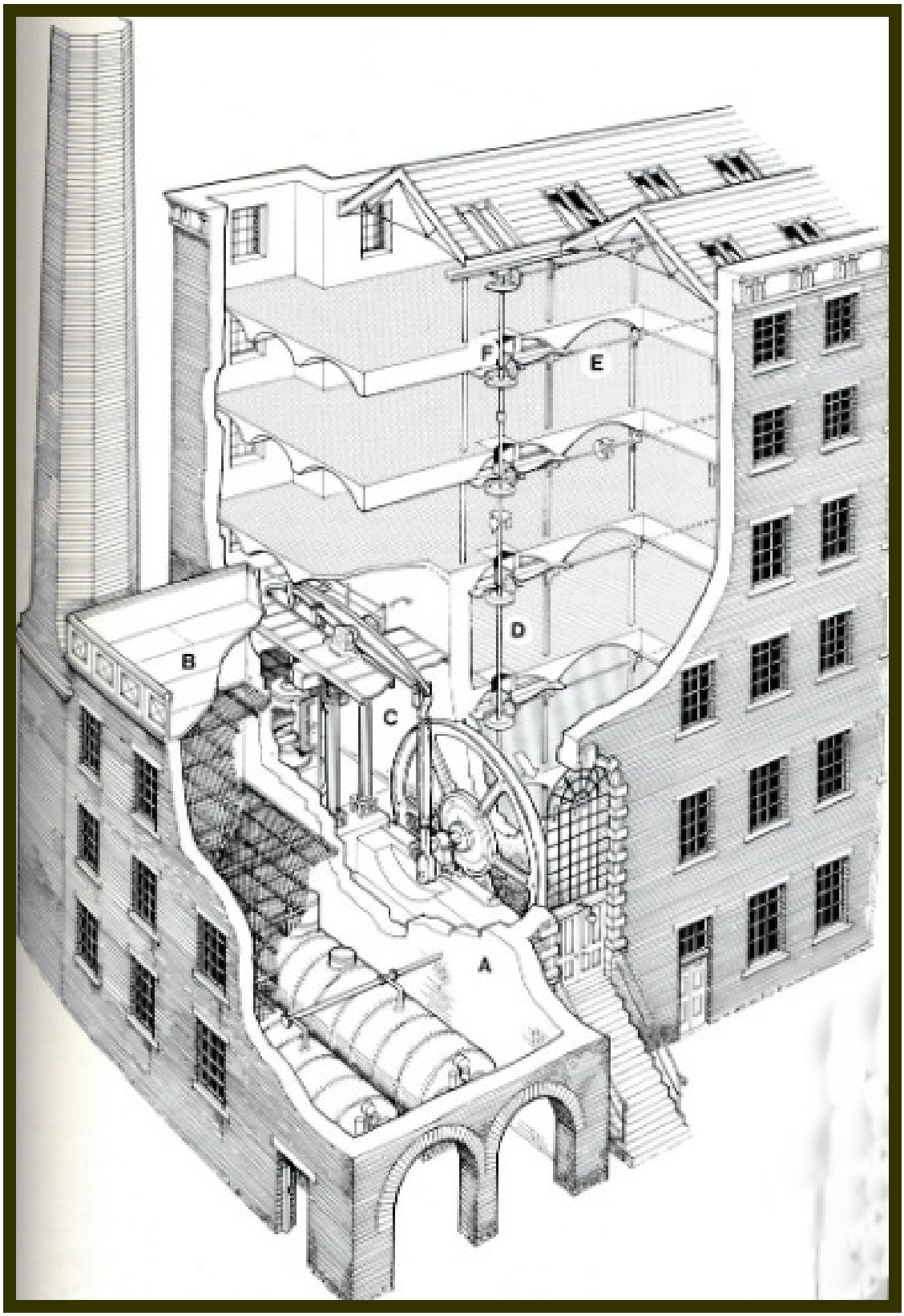
(left) Atlas No.4 Mill, Bolton (right) Houldsworthy Mill, Redditch.
Both late 19th century.

TEXTILE MACHINERY WATER WHEEL



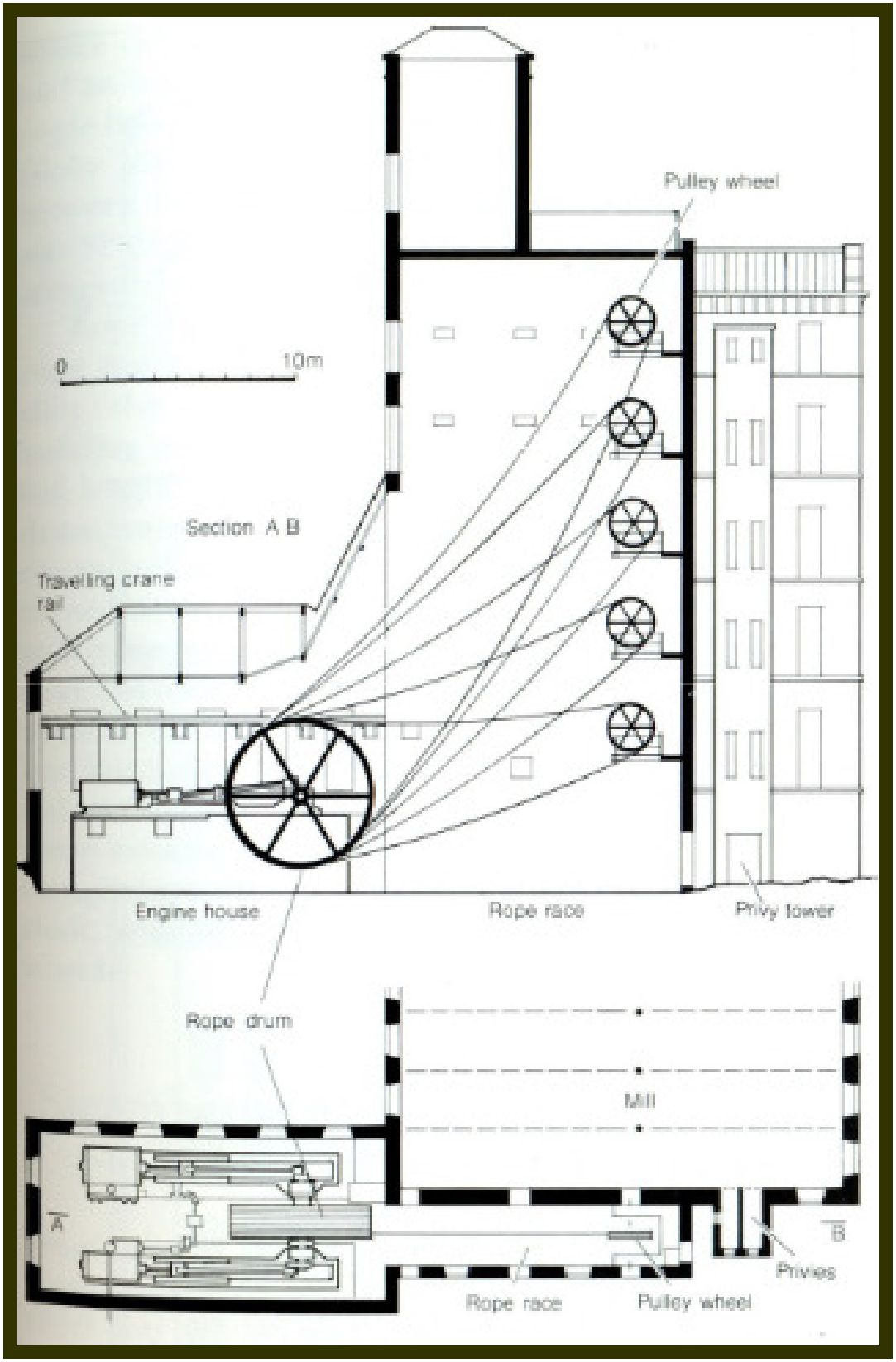
Pitch back water wheel at Lumb Mill, Warley, Yorkshire c.1860
Textile manufacturing was revolutionised by the application of water power.

BOILERS AND TEXTILE MACHINERY DRIVE



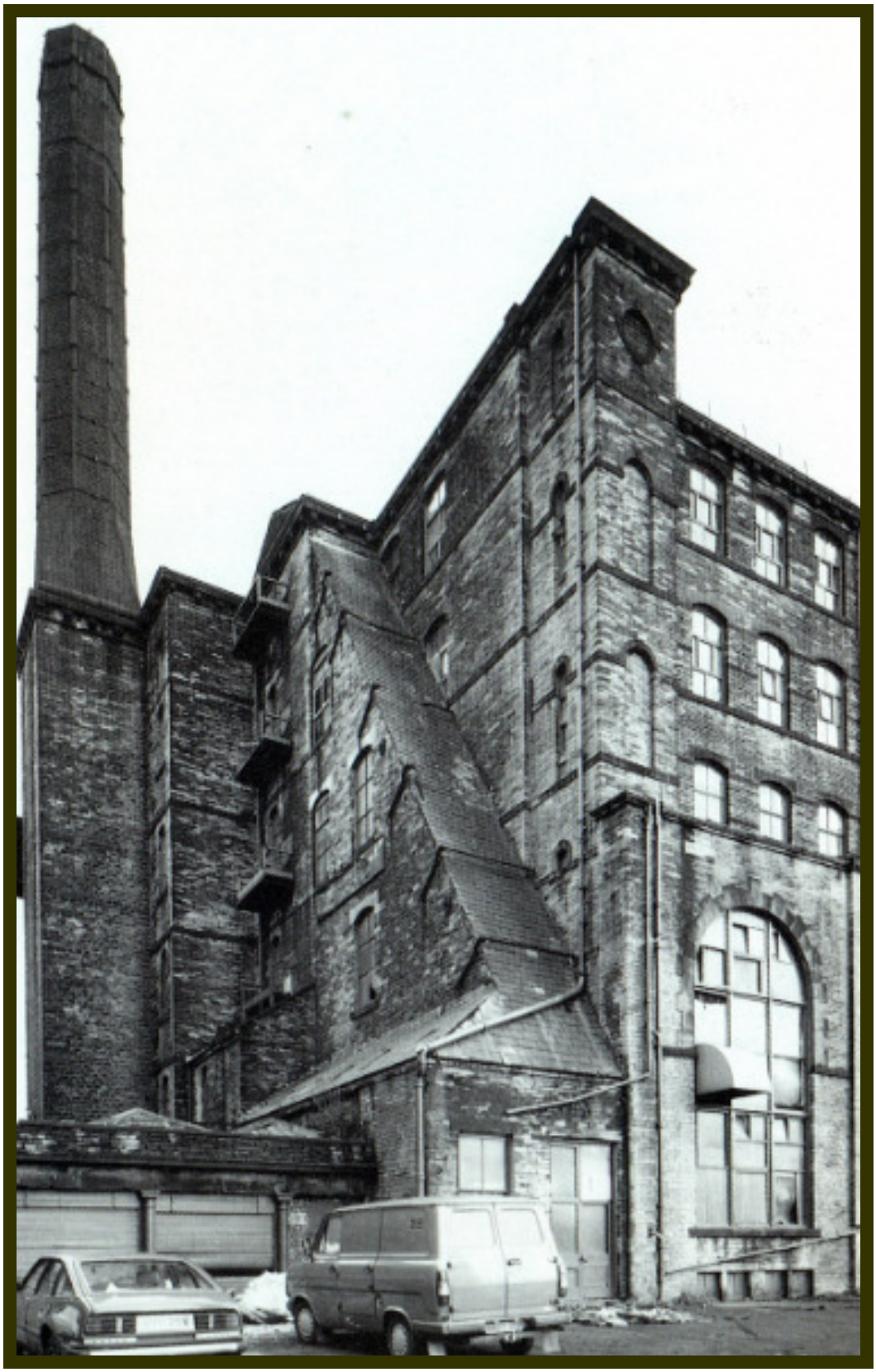
Engine House at Albert Mills. Steam boilers, steam engine and water wheel working in combination driving line shafting to power textile machinery.

TEXTILE MACHINERY ROPE DRIVE



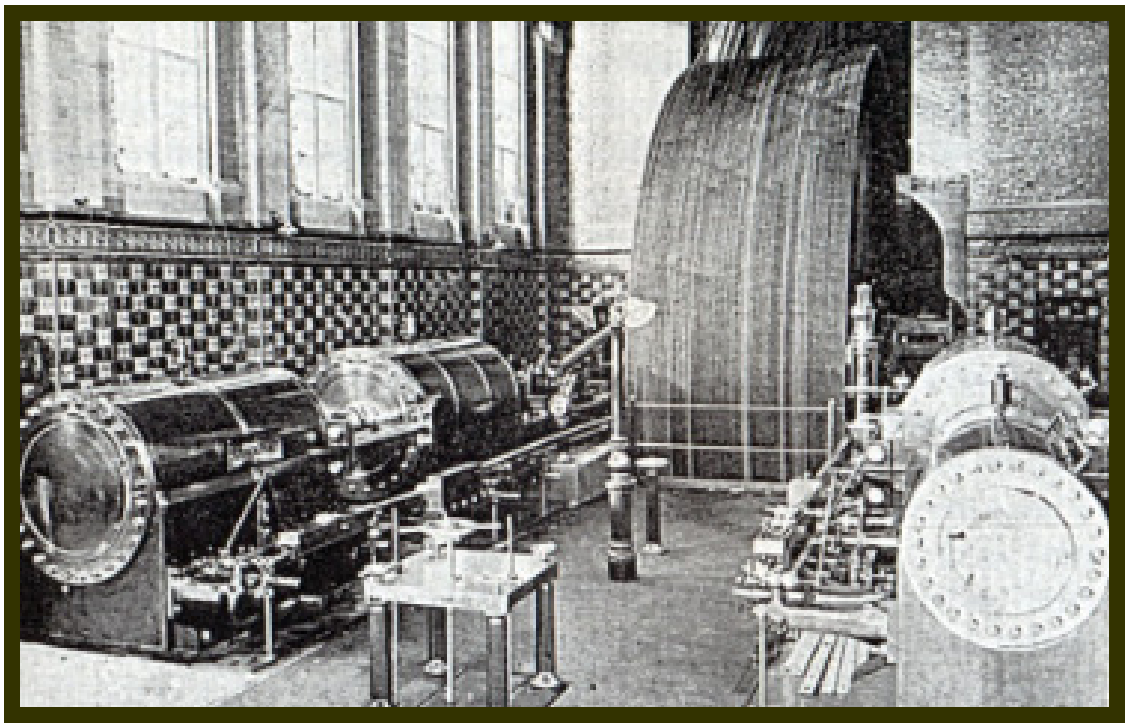
Rope Drive Lowertown Mill, Haworth Yorkshire 1895.

ROPE DRIVE SLOPING ENCLOSURE

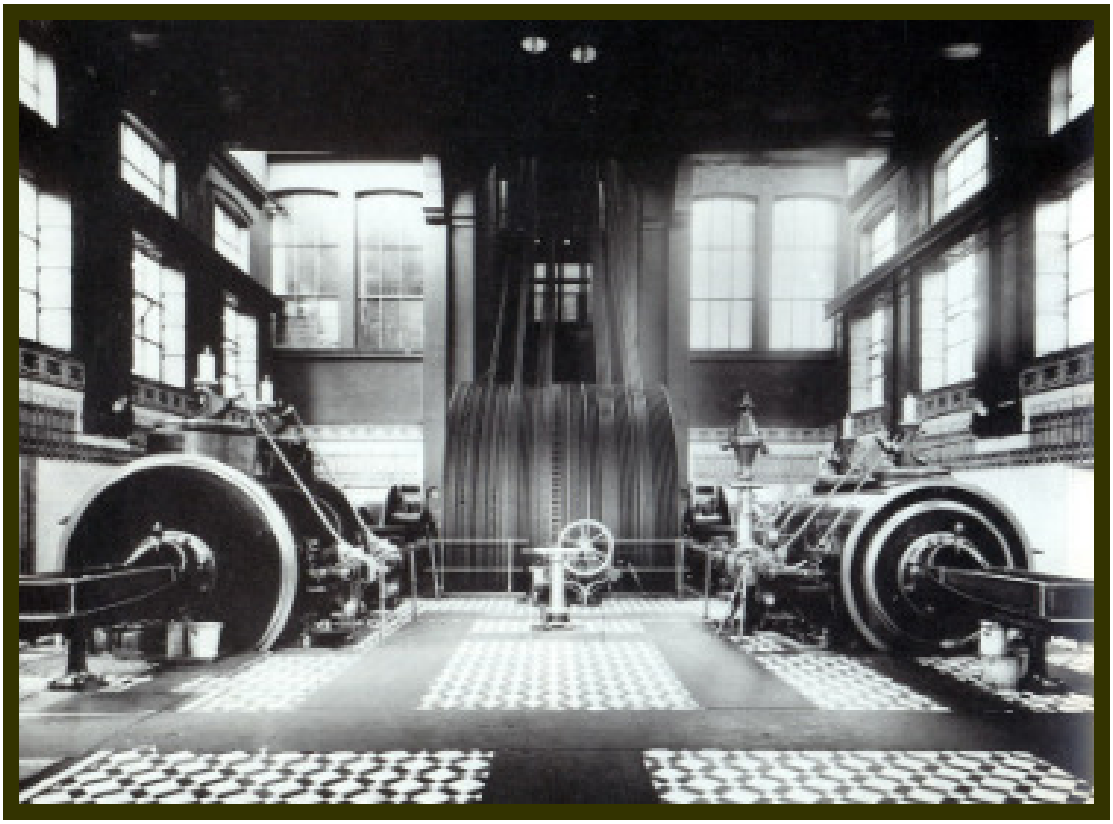


Barkerend Mills, Bradford 1870.

ENGINE POWERED ROPE DRIVES

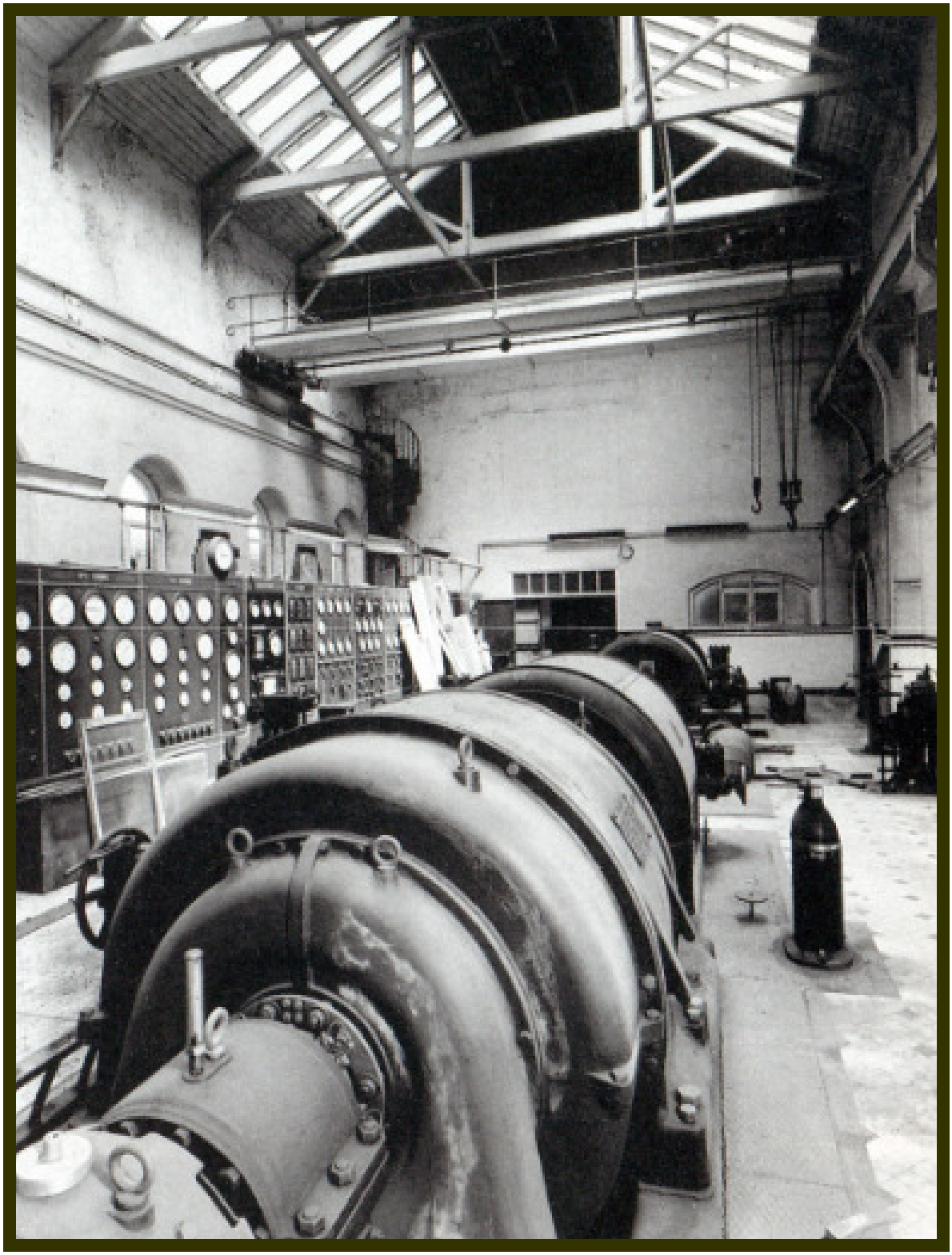


Triple-expansion engines and rope drive, Stockport Mill 1897.



Cross-compound engines and rope drive, Hare Mill, Stansfield 1907.

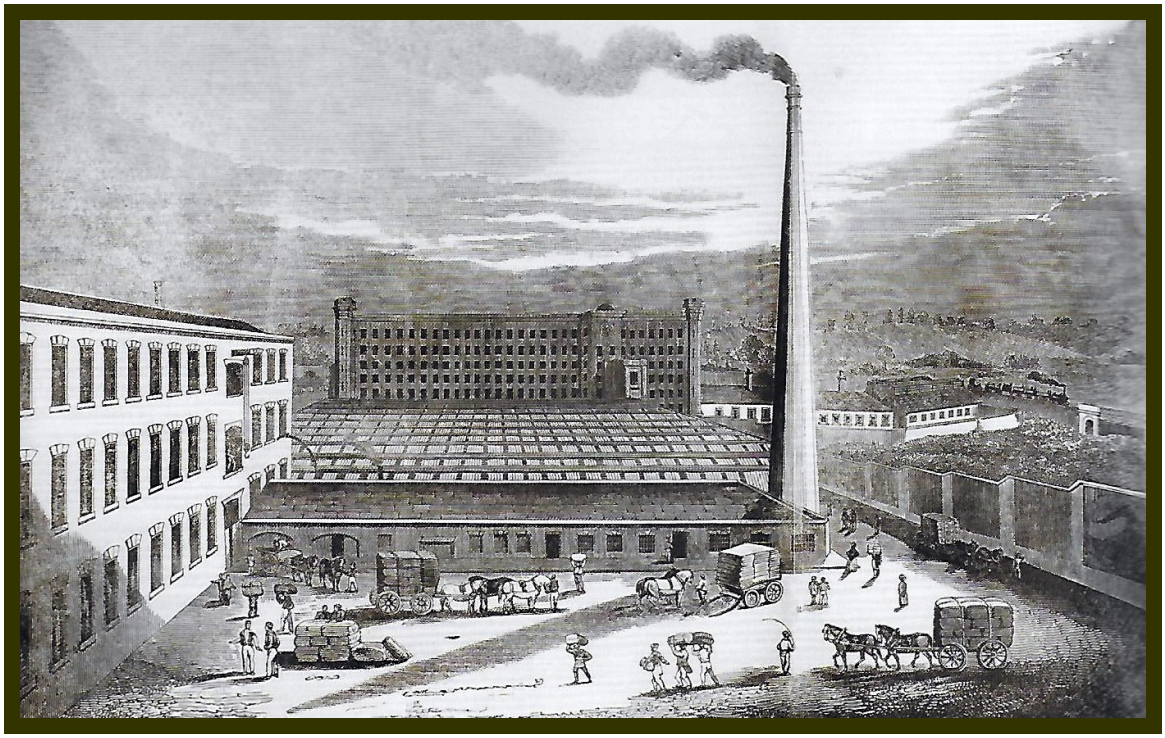
TURBINE ROOM MANNINGHAM MILLS



By 1919, individual electric motors replaced shaft and rope drives.
It was estimated that some 2 million horsepower was then in use.

TEXTILE MILLS IN SOUTH WEST ENGLAND

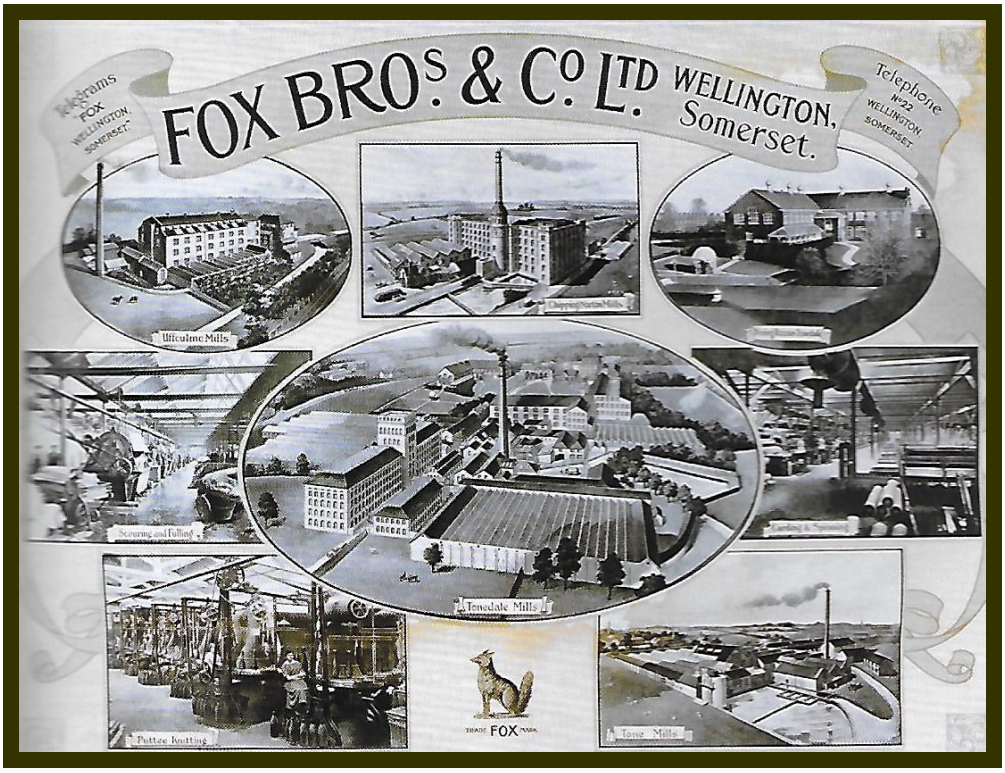
John Heathcoat's Tiverton Factory, converted serge mill c.1820.



The Great Western Cotton Factory, Barton Hill, Bristol 1838.

TEXTILE MILLS IN SOUTH WEST ENGLAND

Patent Renewable Stocking Factory (with gas lighting), Tewkesbury 1860.

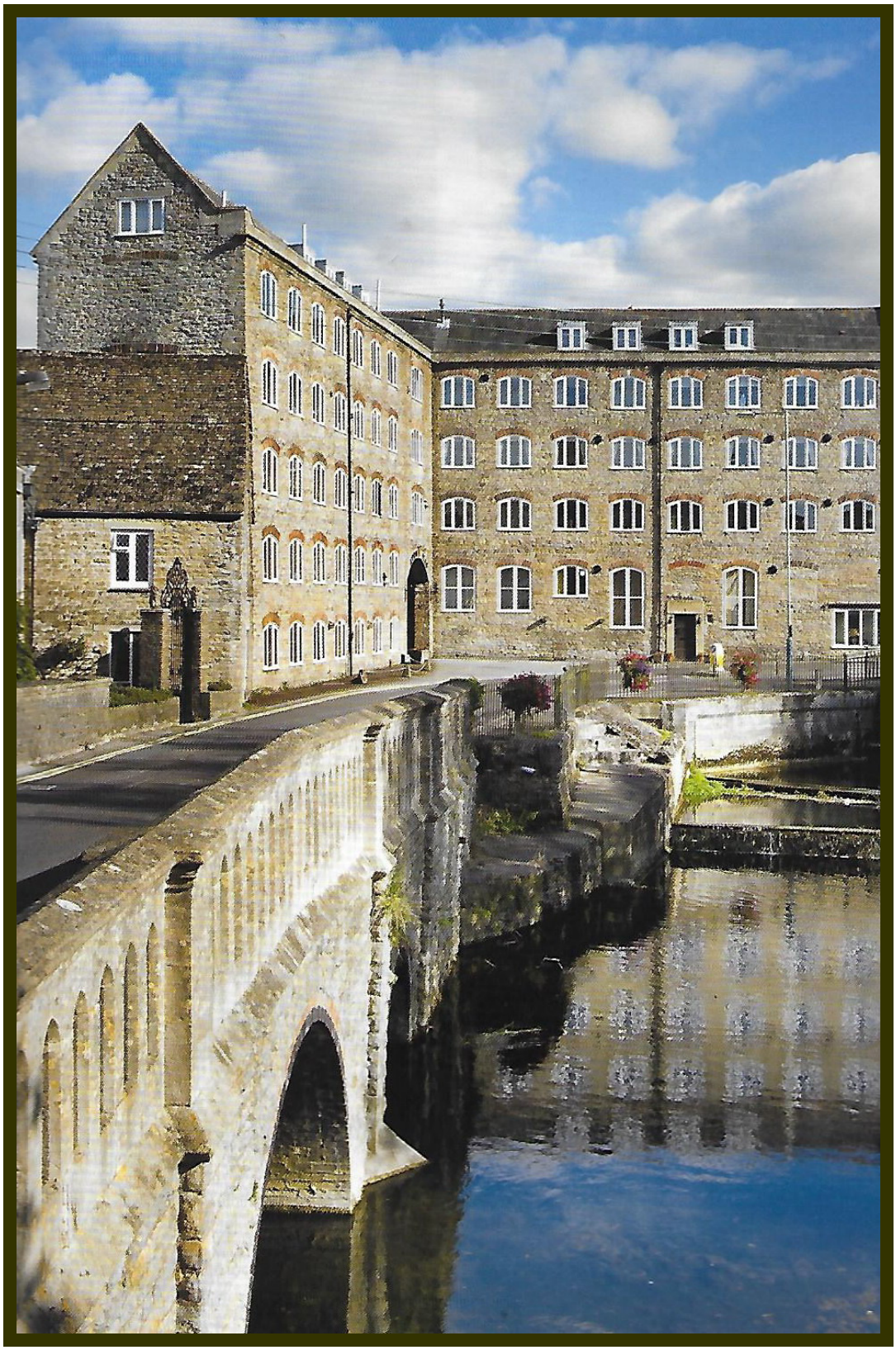


Fox Bros., Wellington, Somerset (once largest textile firm in the South West).

SILK OUTWORKERS

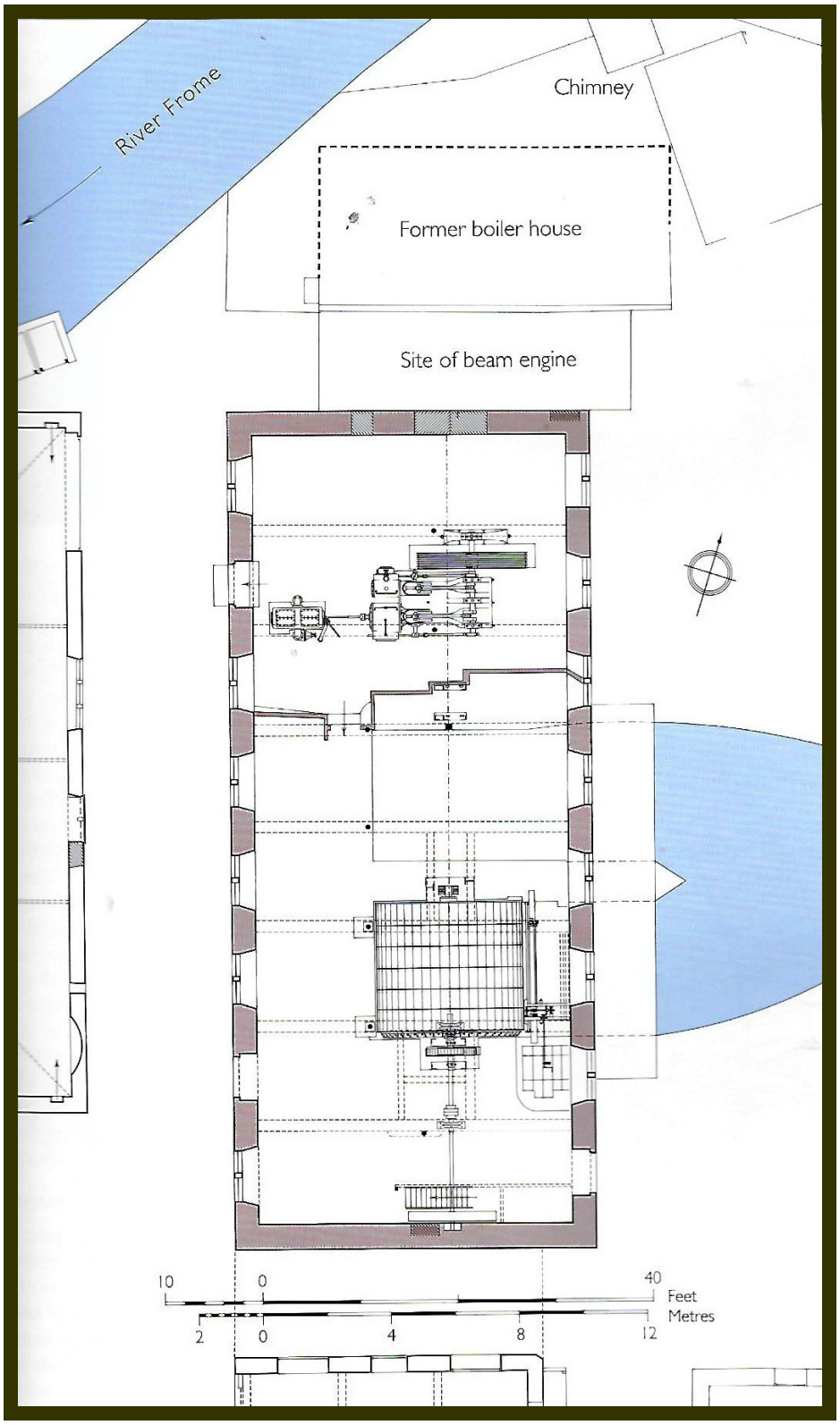
Darshill near Shepton Mallet, Somerset c.1910.

AVON MILLS MALMESBURY WILTSHIRE



Built 1791 at a site suitable for large scale water power.

ST MARYS MILL MICHINHAMPTON GLOS.



Originally side-by-side water wheels, part of integrated complex with two mills, a dry house, loomshop and wool stove. Dates from c.1819. Steam engine and boiler added with later change of use.

COLDHARBOUR MILL UFFCULME DEVON

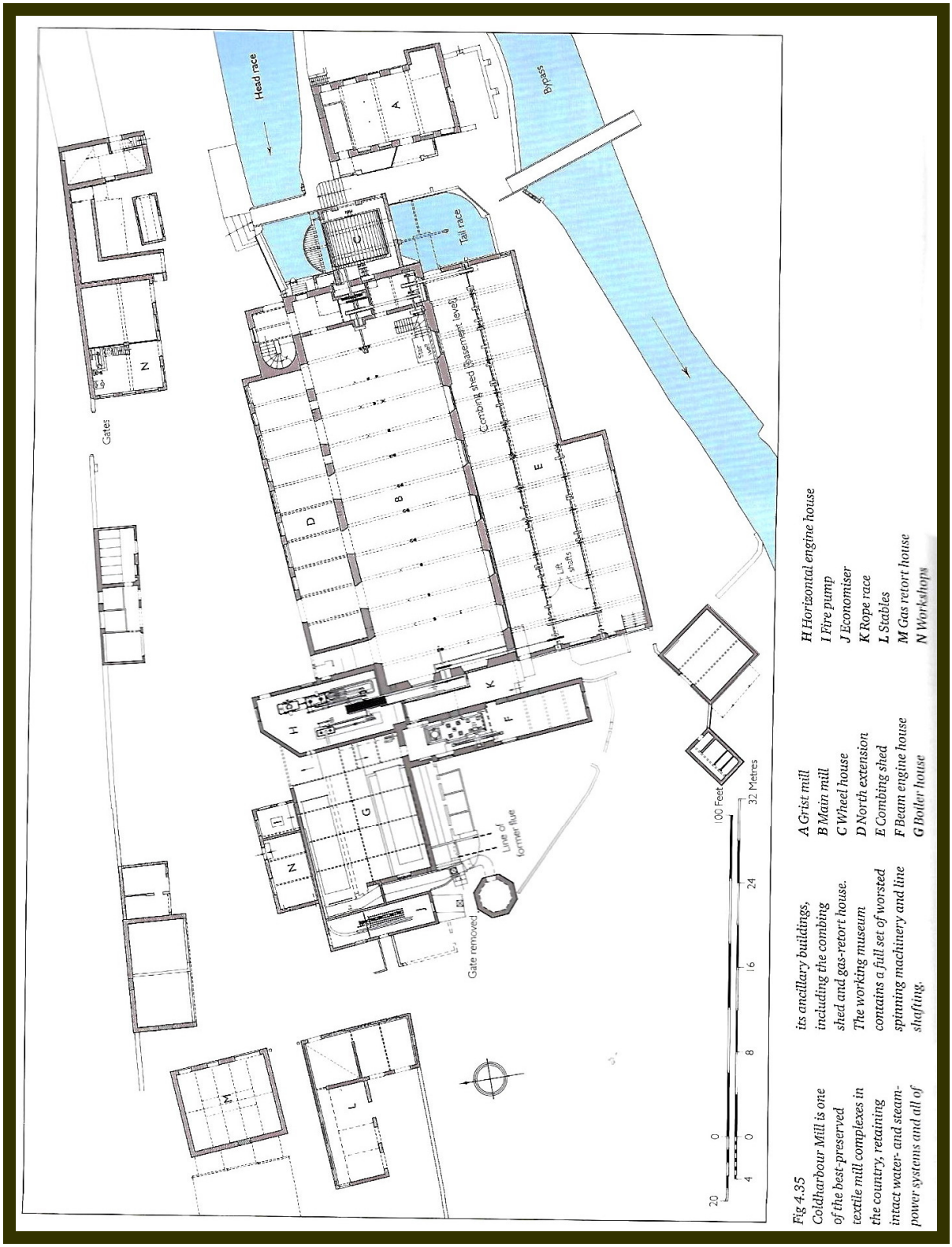


Fig 4.35
Coldharbour Mill is one of the best-preserved textile mill complexes in the country, retaining intact water- and steam-power systems and all of its ancillary buildings, including the combing shed and gas-retort house. The working museum contains a full set of worsted spinning machinery and line shafting.

A well-preserved Working Mill Museum with machinery and power systems, dates from 1797.

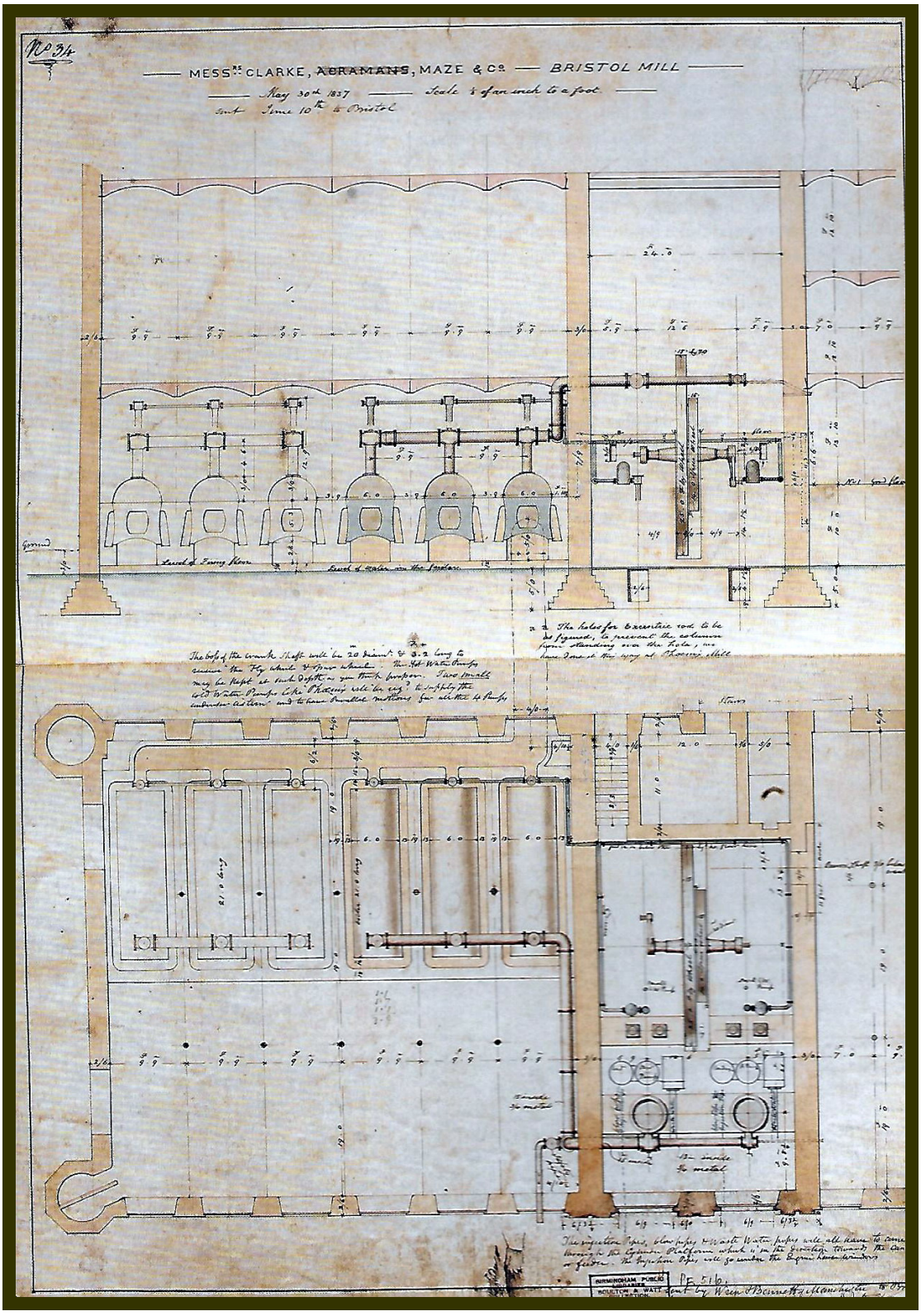
TONE WORKS WELLINGTON SOMERSET

Fig 4.44
The finishing works was completely reorganised within a new north-light shed in 1894, and remained in use until the late 1990s. The line shafting could be driven by steam, water or DC electric power.

***1–12** Scouring machines*
***18–37** Milling machines*
***42, 43** Overhead stretching frames*
***46, 53** Raising gigs*
***55** DC electric motors*
***57** Main belt-drive pulley*
***59, 60** Centrifugal extractors*

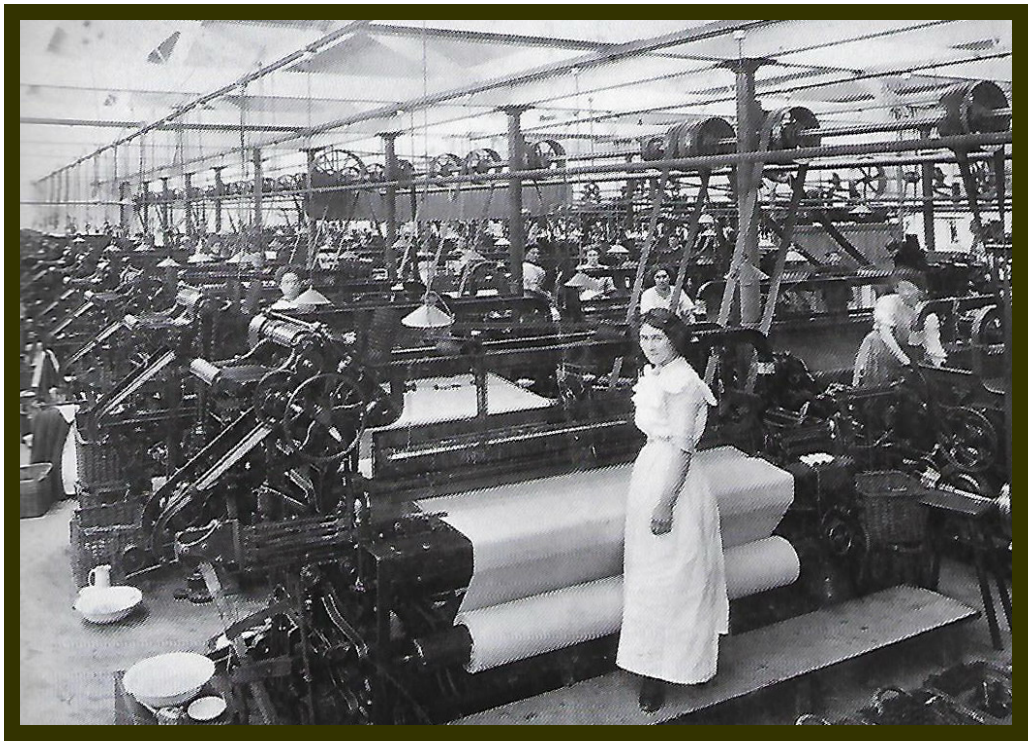
A Spinning Mill built in two phases 1863 and 1873, becoming an industrial complex with centralised steam plant, early fire alarm system and later a DC electricity plant with steam turbine generators.

GREAT WESTERN FACTORY BRISTOL



A five-storey fireproof spinning mill with weaving shed containing 1000 power looms. Having 3 Boulton & Watt engines and 7 Boilers and located alongside the 1809 Feeder Canal, a source of water supply. It is said the first bales of cotton were imported in the maiden voyage of Brunel's *SS Great Britain* (now a Museum in the Bristol Harbour).

GLOUCESTERSHIRE MILLS



Power-loom weaving (with overhead line shafting) at Longfords Mill c.1912.

A later self-acting very long Spinning Mule at Stanley Mill (photo of 1910).

A VARIETY OF BOBBIN MACHINES

REFERENCES AND FURTHER READING

Ebley Cloth Mills, Stroud c.1850: (below) Longford Mills Dye House, Stroud c.1912.

1913 Carrier Air Washers & Humidifiers, Catalogue 13, New York.
1913 Some Silk Mills, Carrier Air Conditioning of America, New York.
1916 Carrier System of Humidifying as Applied to Textile Mills, Bulletin No.103, New York.
1924 Air Conditioning of Textile Mills, Parks-Cramer Company, USA.
1925 Introduction to the Carrier System of Air Conditioning for British Textile Mills, UK.
1952 Father of Air Conditioning, Margaret Ingels, Country Life Press, Garden City, USA.
1962 Textile Air Conditioning, Parks-Cramer Company, USA.
1991 Trouble at Mill, Brian Roberts, *Building Services Engineering*, August, pp.34-35.
1992 Cotton Mills in Greater Manchester, Mike Williams with D. A. Farne.
1993 East Cheshire Textile Mills, Royal Commission for Historic Monuments in England.
1995 Yorkshire Textile Mills 1770-1930, Royal Commission for Historic Monuments etc.
2013 Textile Mills of South West England, Mike Williams, English Heritage.
2017 Central Georgia Textile Mills, Billie Coleman, Images of America,
Arcadia Publishing, Charleston, South Carolina.

Publications by Parks-Cramer and Carrier are held in the Heritage Group Archive with examples on the Heritage website.