THE COTTON CENTENNIAL

1790-1890

GEO. W. S[illegible] MFG. CO.

BUILDE[illegible] HINERY,

WORKS AND OFFICE:
Harris Avenue, Acorn and Elizabeth Streets,

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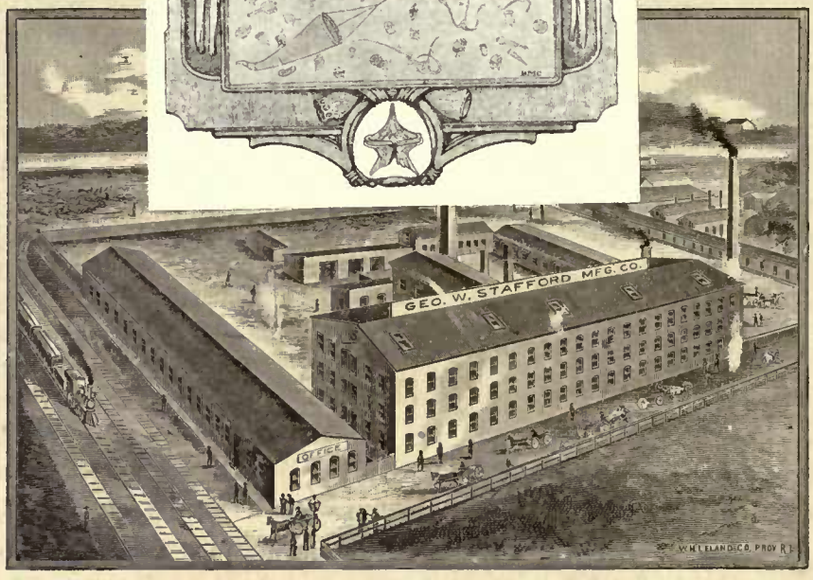

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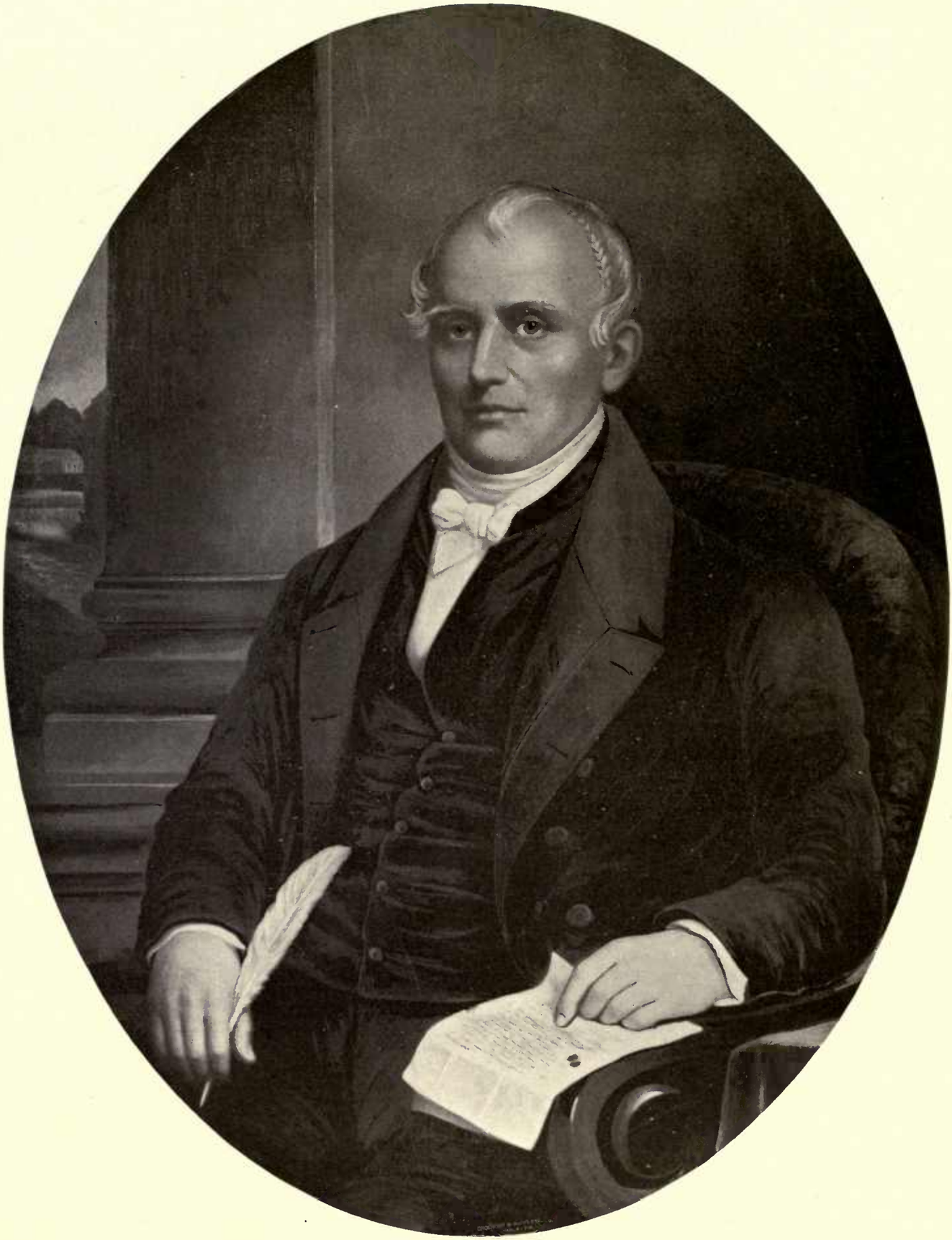

Samuel Slater

FROM THE PAINTING BY LINCOLN, IN SAYLES MEMORIAL HALL, BROWN UNIVERSITY.

THE COTTON CENTENNIAL.

1790-1890.

Carding and its Uses, the Inception and Development of the Cotton Industries of America,
and a Full Account of the

PAWTUCKET COTTON CENTENARY CELEBRATION.

HISTORICAL SKETCHES OF SAMUEL SLATER AND OTHER PIONEER MANUFACTURERS, WITH NOTICES OF SOME OF THE FAMOUS COTTON MILLS OF TODAY, AND A COMPREHENSIVE ACCOUNT OF THE LEADING COTTON MANUFACTURING CENTRES OF NEW ENGLAND AND THE UNITED STATES.

BY

ROBERT GRIEVE AND JOHN P. FERNALD.

ILLUSTRATED

By Portraits, Landscapes and Street Views.

PROVIDENCE: R. I. J. A. & R. A. REID, PUBLISHERS AND PRINTERS.

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INTRODUCTION.

No endeavor has been made in this book to deal with the history of the cotton manufacture in an exhaustive manner, but only to treat its most salient points, and to give at the same time a comprehensive view of the whole field. The work and struggles of the great inventors are briefly but connectedly told, and the evolution of the wonderful machinery, with its great effect in changing industrial conditions, is traced from its rude beginning to the great perfection of the present. As was fitting and proper, the origin and development of the industry in America at Pawtucket has been entered into more extensively than any other single phase of the subject, and, from the necessities of the case, Samuel Slater, "the father of American manufactures," is the central figure of the story.

In tracing the relation of events, it was found necessary, in connection with an extended account of the Centenary Celebration, to give a short sketch of the history of Pawtucket, the growth of its industries, and its present condition and future prospects. Following along naturally, the rest of Rhode Island claimed attention, since here the industry originally centered, and has since always continued prominent, while the chief city, Providence, owes its development to the manufacture. The great cotton manufacturing centres throughout New England then came in for mention, and in conclusion a sketch of the progress of the industry throughout the country is presented.

The first four chapters and the last three, with the exception of portions of chapters three and nine, and the descriptive notices at the end of chapters eight and nine, were written by Mr. Robert Grieve, of Providence. The fifth, sixth and seventh chapters, a considerable part of the eighth and a portion of the third, were written and compiled by Mr. John P. Fernald, of Boston, who also wrote nearly all the descriptive notices of industries at the end of the various chapters.

Nearly all the portraits and a large majority of the other illustrations were made specially for this work, from original photographs, by the new half-tone process that has so recently come into use. The superior character of these pictures as compared with ordinary engravings or with the usual effects produced by mechanical processes, will be readily seen. The credit of producing these excellent results belongs to the Crosscup and West Engraving Company, of Philadelphia, and is due not only to the excellence of its methods, but also to the artistic skill of its managers, artists and engravers.

Some of the illustrations of processes in the cotton manufacture in the past and present, were obtained from the publishers of the *New England Magazine*, and had been used in that periodical in articles relating to the cotton industry. The cuts of the distinctive machines—the spinning frame, the mule and the power-loom—were obtained from leading American establishments at present engaged in their manufacture. From the Willimantic Linen Company some excellent illustrations were obtained. Several of these are pictures of historic methods, and were used in the first chapter. Others depict phases of existing processes, and the remainder are views of buildings. All of these are published in the little book entitled, "A Spool of Thread," issued by that company.

The brief description of modern processes in the cotton manufacture, found on pages 20, 21 and 22, was submitted in proof to Mr. Daniel W. Gray, superintendent of the mills of the Forestdale Manufacturing Company, who made a number of essential changes and corrections. Mr. Ansel D. Nickerson, of Pawtucket, Secretary of the Cotton Centenary Committee, rendered valuable aid in looking over and suggesting corrections in the proofs of the matter relating to Pawtucket and the Celebration. In the line of historical materials, very great assistance was obtained at the rooms of the Rhode Island Historical Society, at the Pawtucket Free Library and at the Providence Public Library, from the respective librarians and their assistants. To all those mentioned and to many others who have extended courtesies in various ways that have helped to increase the worth of the book, the publishers extend their sincere thanks.

THE PUBLISHERS.

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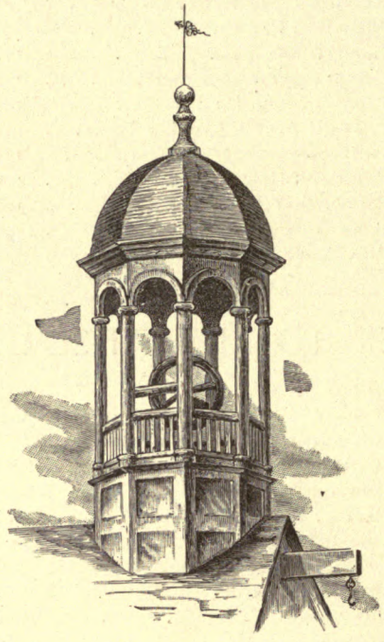


Chapter I.

COTTON AND ITS MANUFACTURE.

How Men First Clothed Themselves—The Philosophy of Clothes—Early Use of Wool and Linen—Cotton First Cultivated and Manufactured in India — Primitive Methods of Manufacture — Invention of the Spinning Jenny by Hargreaves—Sir Richard Arkwright's Inventions of Roller Spinning and Adaptation of the Preparatory Machinery—Samuel Crompton and the Invention of the Mule Jenny—The Power Loom Constructed by Rev. Edmund Cartwright — Radcliffe's Dressing Machine — Cotton Gin Invented by Eli Whitney — Invention of the Steam Engine and its Effect on the Cotton Industry — Growth of the Business—Kinds and Variety of Cloth and Other Goods Produced from Cotton — Present Conditions and Prospects in the United States — The Cotton Plant and its Varieties — Where it Grows — Beginnings of Systematic Cultivation — Sea Island Cotton — Common American Cotton — The Cotton Belt — Seed Planting and Cotton Picking — The Yazoo Delta — Indian, Egyptian and other Cottons — Cotton Seed Oil and its Wonderful History — Manufacturing Processes from the Raw Cotton to the Finished Cloth — General Results.

THE SPINSTER.

THE clothing first worn by mankind was probably the leaves of trees, and as the race originally developed in warm cliates, the broad leaves of tropical plants afforded all the protection that the weather or the first feelings of modesty rendered necessary. The next step in all likelihood was the use of the skins of animals. Then came, as men emerged from barbarism, rude manufactures of wool, linen and cotton, by slow and laborious manual labor. Finally, in the course of evolution, there was developed, within a short period, the elaborate manufacture of various vegetable and animal fibres by wonderful machinery, the production being so great as to be sufficient to clothe all the millions of the earth's inhabitants. Yet every phase of these methods, from the time of garments of fig-leaves to the present, is now in existence. The spinning wheel, the distaff, and the hand loom are yet in use in remote sections of nearly all civilized countries, and are in general use in India and the Orient. Some savage tribes clothe themselves in the most primitive way, while in civilized communities the skins of animals — furs — are very fashionable and expensive articles of apparel.

"The philosophy of clothes" is a very great subject; what men and women have worn and do wear; how and why they wear what they do; and the whole aim, purpose and meaning of clothes have great significance and human interest. Whether for good or evil, the mere question of "what to wear" has not only an individual but a national and international aspect, and many of the pageants of life are alone seen in their true significance when their relation to clothes is understood. War and diplomacy have in the past attempted to deal with many vital questions but have made little progress in settling or solving them, while, on the other hand, peaceful arts and new inventions have done more to change the current of the world's life and to remake history than any other agencies. The rise and development of textile industries is on this account undoubtedly the greatest series of occurrences in the past century.

The use of wool and linen long preceded that of cotton among the Greeks and Romans. In early times linen was largely used among the nations known to history in Eastern Europe, Asia and along the shores of the Mediterranean Sea, and in Palestine, Persia, Syria, Asia Minor and Arabia it was the chief material of clothing. Kings and princes clothed themselves in "purple and fine linen," the purple probably being exquisite woolens. For thousands of years to say that one was born to the purple has carried the meaning that the person to whom it was applied was born of a royal or noble race. Coarse woolen garments, sackcloth, or camel's hair constituted the clothing of the common people.

Since very early times cotton has been used and cultivated in India and the East Indies. Herodotus, the

ROMAN GIRL WITH DISTAFF.

ancient Greek historian, writing about five hundred years B. C., describes the cotton tree and the manufacture of the product into cloth. Although this is the earliest historical mention, it is likely that the Hindoos had long before known the use of cotton. From this period, however, the fact is quite certain that the clothing of the people of India consisted chiefly of cotton garments of domestic manufacture. Very slowly the use of cotton cloth spread over the rest of the world, and not until shortly before the Christian era was it known in Rome, when it was introduced by Cæsar and other generals for tent coverings and awnings. The first cultivation in Europe of the cotton plant was in Spain by the Moors in the tenth century, and very gradually it was introduced into other countries in Southern Europe.

Not until the fifteenth century was cotton imported into England, when it was brought into the country in small quantities, and in 1700 the annual consumption was only 1,000,000 pounds. From that time there was a gradual but slow increase in the amount imported until after the year 1786, when in consequence of the invention of machinery, the increase was enormous, and has continued until the present at a great ratio. The Mexicans and Peruvians understood the manufacture of cotton cloth before the discovery of America, and used it for clothing, draperies and other purposes.

The original methods of converting cotton into yarn and cloth were very primitive. In India, the home of the industry, the contrivances were so crude and simple as scarcely to be dignified by the name of machines. The spinning was done with the aid of the distaff, which was simply a forked stick that held a bunch of cleansed or carded fibre. This instrument was held under the left arm, while with the right hand the cotton was drawn out, twisted into a thread, and then wound, as it was thus made, on a round stick called a spindle. The spinning wheel, which was invented in India, was a great advance on this method, as the spindle was kept revolving by a band from the wheel, and a twist was thereby given to the yarn, while, by the continuity of the motion, greater evenness was obtained. Spinning wheels were either run by hand or by a foot treadle. The looms on which the Hindoos wove their cloth were even more simple than their spinning contrivance. A few upright sticks placed under a tree, a hole dug for the weaver to sit in, his web of threads spread out on the grass before him, the reed — the only semblance to anything in modern machinery about the whole affair — in position, and the workman was ready for his labor. The whole of such weaving must necessarily have been done by hand, yet the quality and fineness of the cloth thus produced has hardly been surpassed by the products of the machinery of modern times. During all the two thousand years that the manufacture of cotton had been practiced by the people of India no improvement, unless the spinning wheel be reckoned as such, had been made in methods.

In England until the time of Henry VIII the distaff was the only spinning instrument in use, and the women who worked at the occupation were known as "spinsters." The spinning wheel, by some authorities said to have been invented in 1530, and by others to have been brought from India, then came into use and for a time helped to keep up with the demand of the hand-loom weavers for cotton and woolen yarns for their looms.

The invention of the fly shuttle in 1733 by John Kay of Bury gave such an impetus to domestic hand-loom weaving that the spinning wheel could not keep up with the demand for yarn, and men began to cast about for a speedier method of spinning. This want was supplied by the spinning jenny, invented in 1767 by James Hargreaves, an illiterate workman in Stand-Hill, Lancashire, England. In 1770 Hargreaves obtained a patent. This

INDIAN GIRL SPINNING.

machine was a development of the spinning wheel, and consisted of a frame in which were set eight spindles which were made to revolve together. Hargreaves still further developed the machine, and finally constructed one with eighty spindles. The jenny could do so much more work than the old spinning wheel that the spinners in the neighborhood fearing their means of livelihood would be taken from them through its agency, broke into Hargreaves' shop at Blackburn, destroyed his machines and drove him out of the place. He went from there to Nottingham where he built a small mill and established a spinning business. Besides inventing the spinning jenny Hargreaves had previously adapted the stock cards in use in woolen manufacturing to the carding of cotton, and he continued to make improvements until cylinder cards were developed as early as the year 1762.

The great inventor of cotton machinery was Richard Arkwright. He was born in Preston, England, December 23, 1732, and in his youth learned the trade of a barber. Afterward he engaged in business as a manufacturer of wigs and a dealer in hair, which occupations he followed until he was thirty-five years old, and during this period of his life he traveled and worked in various places in England and Scotland. Owing to the change in fashion that brought about the disuse of wigs, Arkwright's business declined, and he began to turn his attention to mechanical pursuits. There is good reason to believe that the great idea of spinning by rollers was fully developed in his mind as early as the year 1767, but it was not until two years later that he had a machine in operation. The experiments were conducted in company with a clock maker named John Kay, in his native place, Preston, but when success had crowned his efforts he removed in 1769 to Nottingham, which was a manufacturing centre. He secured a patent July 3, 1769, and having obtained capital from some men of wealth who saw the merits of his invention, he immediately proceeded to systemize the whole operations of the manufacture in a small mill which he started.

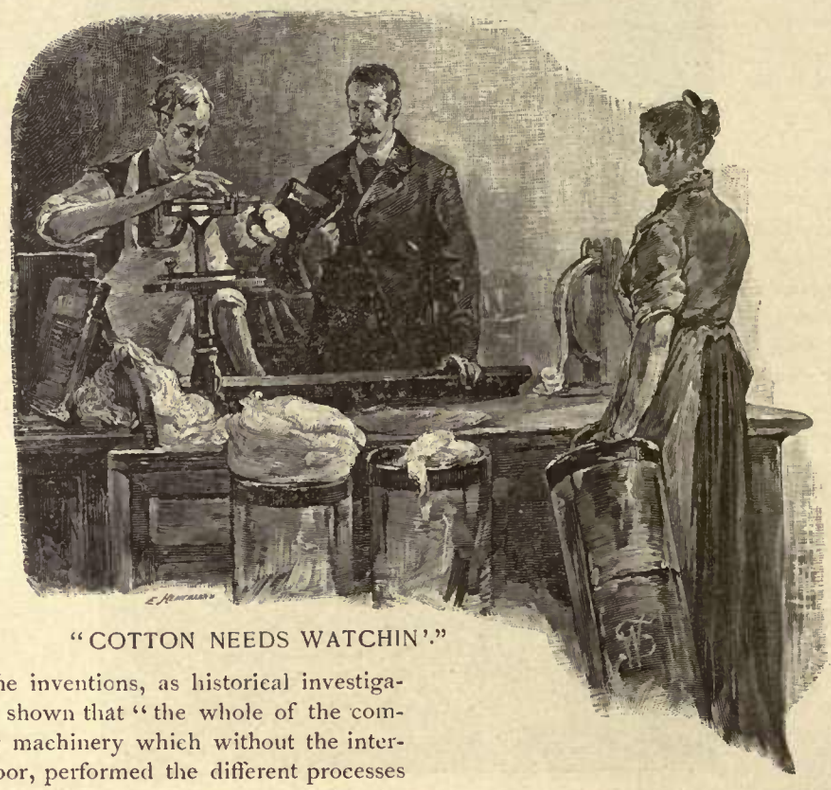
SIR RICHARD ARKWRIGHT,

INVENTOR OF ROLLER SPINNING.

The invention of roller spinning, as applied in the spinning frame by Arkwright, introduced an entirely new principle, and was a great advance over the spinning jenny of Hargreaves. The delicate adjustment of the various parts of the machine, all operating in unison for the accomplishing of one purpose, constituted the spinning frame the first automatic spinning machine invented, and the first of that wonderful series of mechanical contrivances that in the cotton and other industries have since that time revolutionized manufacturing. No subsequent invention has either superseded or substantially modified Arkwright's spinning frame, although many minor improvements have been invented. The invention substantially consisted in drawing out the roving by passing it between a series of three sets of rollers, those in front running at a higher rate of speed than those behind, the lower ones being fluted and the upper ones covered with leather, with the result that the staple was lengthened and some twist given to it; at the same time the revolution of the spindles gave a further twist to the yarn and other mechanical adjustments operated to wind it on the spindles, to perform various minor but necessary motions, and to keep all this mechanism in harmonious, co-related working order. Not only did Arkwright invent this wonderful machine, but he improved existing machines in use for the preliminary work of preparing the cotton for spinning, and may indeed be said to have invented the whole list of preparatory machines, so thorough and well devised were his improvements and adaptations, while the combining of them all in a connected series, in which one took up the work where the other left it, was entirely due to his genius, energy and practical ability.

Arkwright's first mill at Nottingham was driven by horses, but this species of motive power was soon found to be too expensive. In 1771 he entered into a partnership with Mr. Jedediah Strutt and Mr. S. Need, and they erected a mill at Cromford, on the banks of the river Derwent, and operated it by water-power. This was the first cotton mill in the world to be driven by a water-wheel, and from this circumstance the spinning machines were called water frames. The yarn made in this mill, which was in fact the first wholly successful one, was very much more even, firm and hard than that previously made by the spinning jenny, and it was first used by Mr. Strutt to make stockings by his patented process. In 1773 the firm began to make calico wholly of cotton,

and this was the first cloth manufactured in England entirely of this material, linen always having previously been used for the warp. Although Arkwright and his partners had invested upward of £12,000, such were the difficulties encountered that they secured no adequate income until after 1774. In 1779 a new and expensive mill that they had erected at Chorley was destroyed by a mob, because of the popular feeling that the new machinery would throw workmen out of employment. Meanwhile Arkwright was developing the machinery as already described, in the mill on the Derwent, and in 1775 he obtained patents. His patent for the roller spinning frame had been contested in 1772, but a verdict was rendered in his favor. A suit as to the validity of the patents of 1775 was decided against him in 1781, but in 1785 he secured a favorable verdict. This result created such consternation among manufacturers who had begun to use the Arkwright machines after the adverse verdict of 1781, that a combination was formed against Arkwright. A new trial was had, and the patents were canceled on the ground that the specifications were defective. Another trial was denied Arkwright, although there is little doubt that he could have made clear his undoubted right to the inventions, as historical investigation has practically shown that "the whole of the complicated self-acting machinery which without the intervention of hand labor, performed the different processes necessary to change raw cotton into yarn suitable for warp, was substantially his invention." At the time that he thus lost exclusive control of the new cotton machinery he had over 5,000 people in his employment, and was rapidly acquiring an immense fortune from his mills and the sale of his patents.



"COTTON NEEDS WATCHIN'."

The canceling of the patents, instead of interfering with Arkwright's success as a manufacturer, seemed only to spur him on to further and greater efforts, his enterprise reached out in all directions, and he continued perseveringly to extend and develop his business. He established mills in various places in England, and was interested in those started by Daniel Dale at New Lanark in Scotland, where subsequently Robert Owen put his socialistic experiment into operation. His genius was manifested in the conduct and management of his mills, no less than in his invention of the machinery, for he introduced excellent methods in all departments, and by the systematic training of his employés, developed them into well-trained and capable assistants. This was the beginning of the "factory system," so called from the fact that those engaged in manufacturing worked together under one roof where all the details of the industry were conducted, instead of being employed in their homes or in small shops as had been the custom previously. Arkwright began to use Boulton & Watt's steam engine in his mills at Nottingham in 1790, and this was probably the first application of steam-power to cotton machinery. In 1786 the inventor was knighted and became Sir Richard Arkwright. He died August 3, 1792, at the age of 60. Arkwright's career is one of the most wonderful on record. With no academic education, and little or no experience in mechanics to begin with, by his own energy and ability he developed agencies that increased the productive power of the world to a greater extent than any single individual has, either before or since.

As an immediate result of the setting aside of Arkwright's patents in 1785 cotton mills were erected in all parts of Lancashire and adjoining regions, and what in modern times would be called a great boom in manufacturing ensued. Indeed the great and constantly growing demand for raw cotton dates from 1786.

It was brought out in the evidence at the trial of the Arkwright patents in 1785, that a machine for roller spinning had been invented in 1738 by John Wyatt and a patent taken out in the name of Lewis Paul, Mr. Wyatt's partner, but this machine failed to be effective and was probably lacking in essential elements. Indeed it is thought that this early machine lacked the necessary feature of fluted rollers, such as the under tier was in Arkwright's machine, and besides it had no such combination of elements as the perfect machine possessed.

The next event of importance in the cotton manufacture was the invention of the mule, or, as originally known, the mule jenny, by Samuel Crompton of Bolton, Lancashire, in 1779. This machine was a compound of Arkwright's roller spinning frame and Hargreaves' jenny, from which circumstance it received its unique name. The mule consisted of a long bank of rollers, and a movable carriage on which were the spindles. The

carriage ran in and out from the rollers, drawing out the yarn on the outward trip, while the spindles revolving at the same time gave a twist to the threads, and on the inward journey by a reversal of the motion the yarn was wound on the spindles. The best features of both the jenny and the spinning frame were thus combined, the result being a spinning machine from which the best results have been obtained, as by its means yarns of unexampled fineness, evenness and strength have been produced. Crompton was a man of timid, retiring temperament, and was so lacking in business foresight that he failed to patent his invention. He operated a little manufacturing establishment, and "though his means were but small, his economy in living made him always in easy circumstances." In 1812 Parliament granted him £5,000 in recognition of his services as an inventor, and at that time there were in operation in the United Kingdoms between four and five million mule spindles. This money he and his sons used to start a bleachery, but the enterprise proved a failure and Crompton was reduced to poverty. Some of his friends in 1824 raised enough money to buy him an annuity of £63, but he only enjoyed this two years, as he died January 26, 1827.

The mule as first invented was only partially automatic in its action, the attendant, called the spinner, being required to bring out and push back the carriage, and guide other portions of the machine as well. In 1792 William Kelly of Glasgow, Scotland, improved the machine so that it could be moved to a much greater extent by power, and the spinner only had to guide the carriage on its inward trip. In 1824 the self-acting mule was invented in England by Richard Roberts, and patented in the following year. In 1830 the inventor obtained another patent for an improvement that still further perfected the machine, and in principle made it what it is to-day. This perfected machine did not come into general use until after 1860, many hand-mules remaining until that time, in the factories both in Great Britain and America. Since then it has been greatly improved in its automatic character, performing a great complexity of motions and only requiring attendants to piece the broken threads and supply the roving. This machine is the largest employed in the cotton manufacture, many pairs of mules in the present factories containing over two thousand spindles.

ELI WHITNEY,

INVENTOR OF THE COTTON GIN.

Nothing is more remarkable in connection with the invention of the cotton machinery than the fact that as soon as the necessity arose for a new machine to take up and continue the work of those already in existence some inventor arose who supplied the want. Thus the spinning jenny was a result of the greater demand for yarn caused by the invention of the fly-shuttle, and the water frame performed the same duty which had become too great for the spinning jenny to fulfill. All of the Arkwright machines supplemented each other in the same manner, each one growing out of a demand created by its immediate predecessor. These seemingly providential occurrences gave rise to the theory that the demand for any improvement will in the nature of things soon be followed by a device or an arrangement that will supply it. Such a theory is not however, borne out by universal testimony or experience, since both before and after this period of invention, there have been great public wants in mechanics, in society and in national affairs that have brought no corresponding supply to satisfy them. It is undoubtedly true, however, that many mechanical devices have originated in response to the recognition of an urgent need for them, which has stimulated inventors to work along clearly perceived lines, to secure particular results. Two notable inventions, which completed the list of the cotton machinery, and finally rendered the modern growth of the manufacture possible — the power loom and the cotton gin — illustrate this fact in a graphic manner.

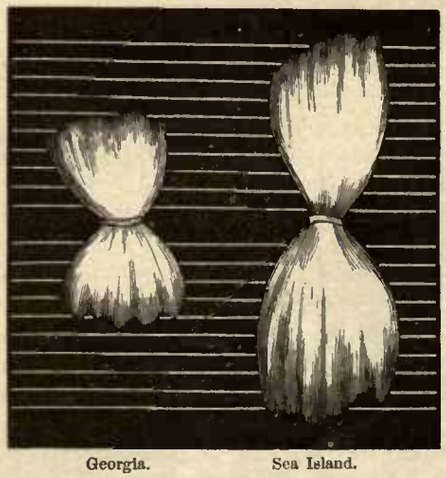
The power loom was invented in 1785, by Rev. Edmund Cartwright, a clergyman of the English Established Church. His attention had been called to the great desirability of a machine for weaving, through a conversation with some Manchester manufacturers, at a place called Matlock, in the summer of 1784. One of the company said that so much yarn would be produced when the Arkwright patents expired that there would not be people enough in England to weave it into cloth. Mr. Cartwright thought such a machine could be constructed, but the manufacturers argued that it was impossible, and mentioned various technical difficulties that in

THE PICKING ROOM AND THE BOSS PICKER.

their opinion would render it impracticable. Mr. Cartwright was unable to answer these objections as he was totally ignorant on the subject, and had never seen a person weave, yet he controverted the position of the manufacturers and instanced the chess playing figure that had been exhibited in London, as an example of what complicated movements could be performed by machinery. This conversation set him to thinking about the subject, and although he had never seen a loom, he came to the conclusion that only three movements were necessary. He immediately employed a carpenter and smith to construct a machine embodying his ideas, and getting a weaver, he had it set at work as soon as finished. Although a very crude device, requiring two strong men to work it, the result was satisfactory as it did weave a piece of cloth. Mr. Cartwright then secured a patent, thinking he had solved the problem, but after seeing how easily the hand looms then in use worked, he very materially improved his loom, embodying all the essential principles of the loom as it now exists. This was not accomplished until 1787, when he took out his final patents. These patents were not only for plain weaving but also for checks. Mr. Cartwright was not successful as a manufacturer, as he sunk a large fortune inherited from his father, but he obtained a grant of £10,000 from Parliament in 1809, in recognition of his services as an inventor. Like other inventions, the power-loom excited the fears of the work people that it would deprive them of employment, and one of Cartwright's establishments at Manchester, containing 500 looms, was destroyed in 1790 by a mob. Mr. Cartwright also invented a wool combing machine.

One very great difficulty that stood in the way of the successful operation of the power-loom at first was the necessity of stopping the machine every few minutes to dress the warp. Probably the failure of Mr. Cartwright as a manufacturer was due to the heavy expense entailed by this requirement. This obstacle was not overcome until 1803, when a dressing machine was invented by Thomas Johnson, a weaver in the employment of Radcliffe & Ross, cotton manufacturers, Stockport. The honor of this invention, however, really belongs to Mr. Radcliffe, as it was under his direction, with this end in view, that Johnson and other workmen conducted their experiments. This machine rendered the power-loom thoroughly available, as the warp could be used continuously without stoppage for any purpose except piecing or renewing the warp and filling. The original dressing machine, like the mule, was not a thoroughly automatic machine, but subsequent improvements have brought it to the same degree of perfection as the self-acting mule, and these improved "dressers," commonly known as slashers, are now in general use. Substantial improvements were made in the power-loom by H. Horrocks, a manufacturer of Stockport, England, in 1803 and in subsequent years. Very soon after the loom was invented it was introduced into Scotland, and was there brought to a high degree of perfection sooner than in England, so that a larger number were for years in use there than in the original home of the invention, south of the Tweed. It was the "Scotch Loom" that was introduced into Rhode Island at Lymansville in 1817, and it was the type of the prevailing styles of American looms.

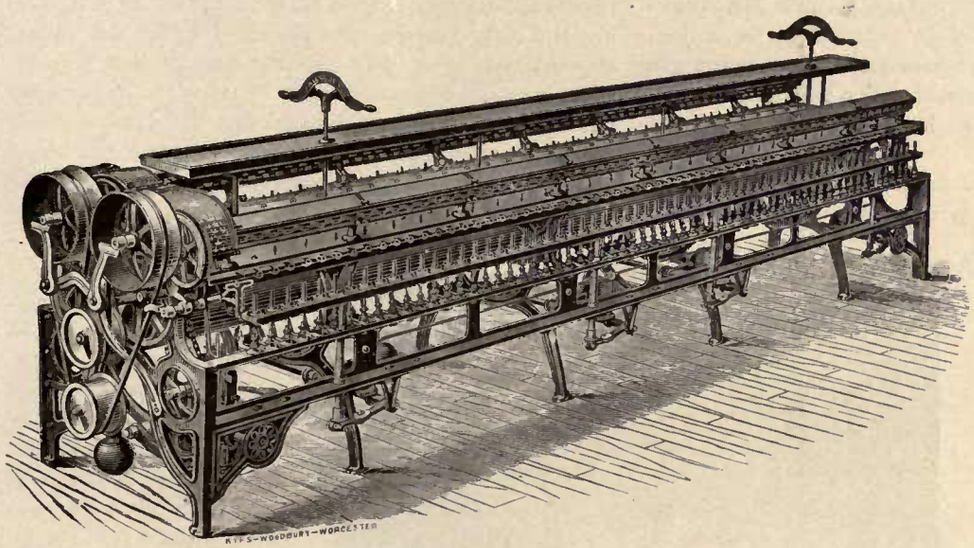
Vast improvements have been made in all the cotton machines in the direction of making them self-acting or



Georgia. Sea Island.

COTTON STAPLE—FULL SIZE.

automatic, enlarging the scope of their action by additions to the mechanism, and by readjustments and simplifications that have rendered them more effective. Examples of the first method have already been given in the mule and the dressing machine; the second is illustrated by the history of the loom, to which a great

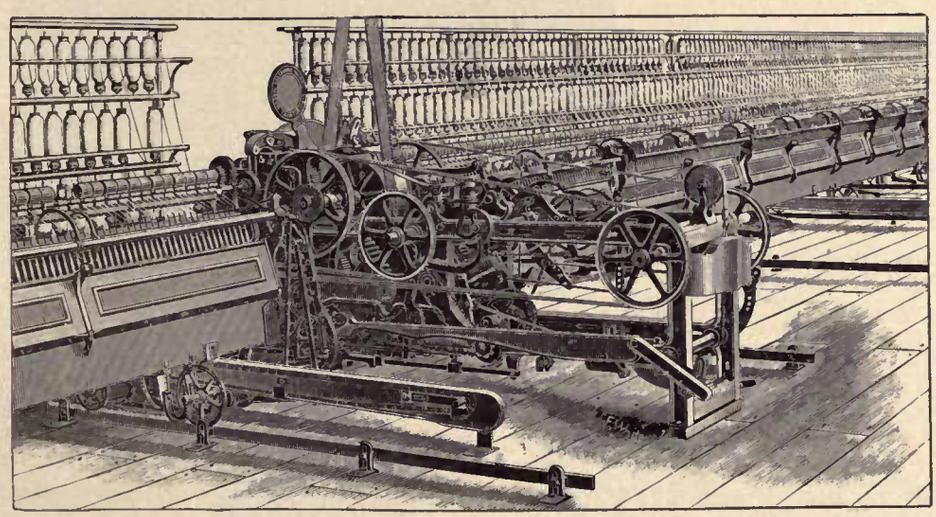


THE MODERN SPINNING FRAME. (FALES & JENKS.)

variety of attachments have been invented, rendering possible all descriptions of fancy and pattern weaving; while the third method has been applied to nearly every one of the machines.

These inventions stimulated the demand for cotton to a very great extent, especially after the canceling of Arkwright's patents in 1786. Until near the close of the eighteenth century, three-fourths of all the cotton used in England came from the West Indies. After the peace of 1783, at the close of the Revolutionary war, the rumors of the wonderful English inventions, had the effect of inducing the planters in the Southern United States, to attempt the more extended cultivation of the cotton plant, which had previously been grown only on a small scale for domestic use. But the difficulty of separating the seed from the fibre was so great that it was a day's work for one person to produce a pound of clean staple. Under these circumstances the extensive raising of cotton for market was heavily handicapped.

In 1793, however, a machine was invented by Eli Whitney, which successfully accomplished this much desired result. Whitney was a native of Massachusetts, and a graduate of Yale college. He was engaged to go to Georgia in the autumn of 1792, as a private tutor, but on arriving at his destination found that the situation had been filled. Being entirely without resources this was a serious predicament, but having on his journey south formed the acquaintance of the widow of General Nathaniel Greene, the famous Rhode Island revolutionary hero, he was invited by her to make his home at her plantation near Savannah. Several officers who had served under General Greene visited the house soon after, and during a conversation on the desirability of a machine for cleaning cotton, Mrs. Greene suggested that Mr. Whitney construct one, avowing her belief that he would succeed from the fact he had already made several mechanical contrivances for herself and the children. Soon after, Mr. Whitney began to experiment in the basement of the house, the only persons in the secret being Mrs. Greene and Mr. Phineas Miller, who subsequently married Mrs. Greene. Although he had very rude materials and appliances to work with, having even to draw the wire he used,



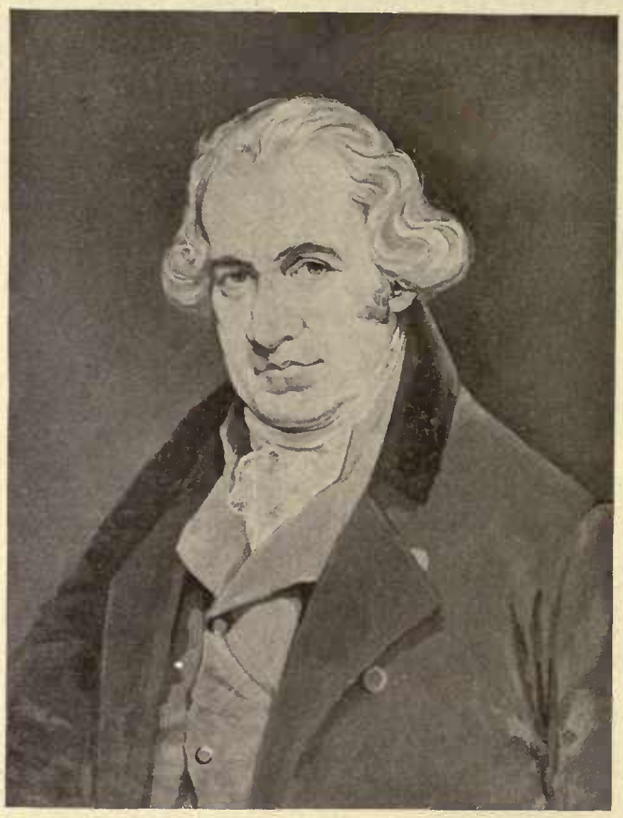
MODERN AMERICAN SPINNING MULE. (MASON.)

before the close of the winter the machine was completed and in working order.

The new invention was called the cotton gin, and was very simple in construction, consisting chiefly of a cylinder with circular saws fitted thereon, and revolving against larger cylinders covered with stiff brushes. When perfected in its mechanical adjustments it per-

formed a thousand times more work than could be done by hand. Reports of the new machine soon spread, and before Miller & Whitney, who had formed a partnership, could secure a patent their shop was broken into and their first machine carried away, and although patents were finally obtained, yet prolonged contests in the courts ensued for many years before Mr. Whitney and his partner secured the fruits of his invention, and a return from their investments. The cotton gin stimulated the cultivation of cotton to a wonderful extent, and rendered profitable the labor of the slaves on the plantations.

James Watt invented the steam engine in 1767. Previous to that time a very imperfect form of engine existed and was used chiefly for pumping water in the Cornwall mines. Watt's invention was a radical departure from the principle of the old machine, and, with the improvements he afterward made, it embodied the essential elements of the steam engine as it exists to-day. Some very important modifications were, however, made by other inventors, among which were the compound engine and the introduction of high pressures. In 1774 Mr. Watt formed a partnership with Mathew Boulton, and they began the manufacture of steam engines at the Soho works in Birmingham. The invention of the steam engine and of the cotton spinning machinery occurred at the same time, and patents were obtained for both in the year 1769. When Boulton & Watt began the manufacture of engines the practical success of the cotton machinery had just been demonstrated, and as the manufacture increased in the next few years, it was soon found necessary to employ engines to drive the machinery in many of the mills where water-power was either not available or was inadequate, while other conditions were propitious. The first use of the steam engine in the cotton industry was in Arkwright's mills, at Nottingham, in 1790. James Watt was born in Greenock, Scotland, January 19, 1736, and lived to be 83 years of age, his death occurring August 19, 1819. He produced many minor but useful inventions and also acquired some reputation as a writer and scientist.



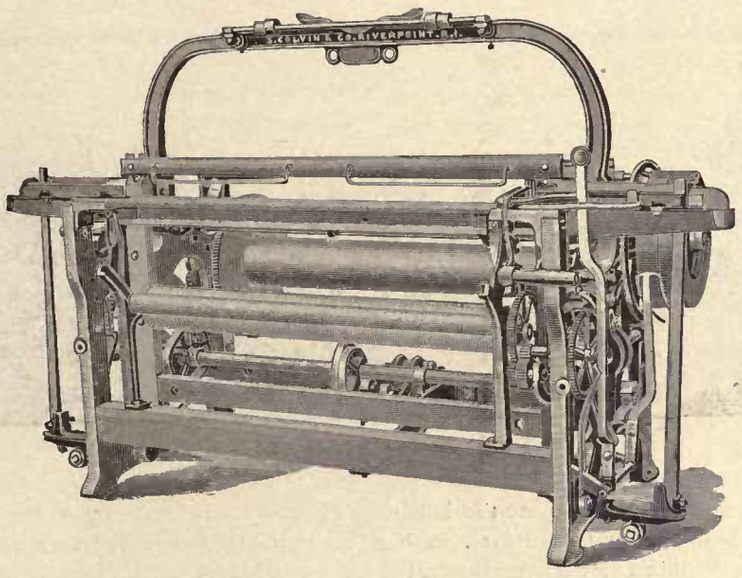
JAMES WATT,

INVENTOR OF THE STEAM ENGINE.

The way in all directions being now fully opened, both for the manufacture and for the treatment of the raw material, the cotton industry, in its two phases of cultivation and manufacture, increased at an unprecedented rate. During the first half of the eighteenth century Great Britain consumed between one and two million pounds of cotton annually. The following years up to 1786 there was a gradual increase. From that period the consumption increased enormously until during the early years of the present century the annual average was more than one hundred million pounds. This increase continued until by 1850 the importation had reached and gone beyond one thousand millions every year, and at the present time more than two thousand million pounds enter British ports annually. The production has fully kept pace with this demand, and at the present time the United States produces over seven million bales annually, aggregating in weight over three thousand million pounds. Of this enormous quantity the larger part is exported.

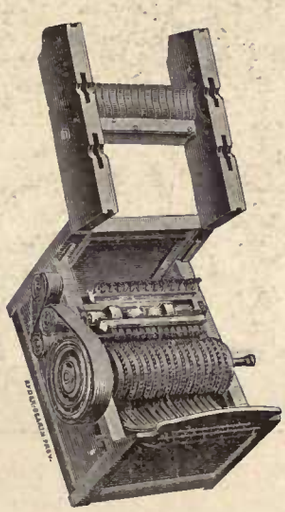
No other material in use among civilized people is used for a greater variety of purposes than cotton. Its chief use, however, is for clothing, and in this line its functions could hardly be performed by any other vegetable or animal fibre. Cotton cloth may be said to be divided into four general classes, each of which has many varieties, namely: First — sheeting and shirtings; Second — lawns, muslins and fancy patterns; Third — prints; Fourth — ginghams and checks. The first class includes all the numerous kinds and qualities of cloth used for bed-linen, for undergarments and for other purposes requiring a firm, strong and dense cloth, and the cloths of this class are plain, without patterns. The second class comprises a great variety of so-called fancy cottons, lawns and muslins, many styles being in imitation of linens and light woolens, and others in all sorts of intricate and beautiful patterns woven into the cloth; these goods have come into use to a great extent within the past twenty-five years, chiefly for women's wear. The third class is formed of print cloths, or calicoes, which are woven plain and patterns are afterwards printed on the outer surfaces, although a large proportion of the annual production is used for linings and miscellaneous purposes without being printed. The fourth class, composed of ginghams and checks, is distinguished from

calicoes by having the pattern woven in, instead of being printed. Other products formed of cotton are sewing thread, stockings, underwear, hats, wadding, lamp-wicks, table cloths, quilts, counterpanes, handkerchiefs, seamless bags, cordage, lines and twines, flannel, tape, webbing, cottonades, jeans, laces, cotton velvets and a multitude of other goods. Cotton is also largely used in combination with wool in the manufacture of knit underwear, hosiery and so-called shoddy goods, cassimeres, etc.



COTTON POWER LOOM.

With the exception of the greatly varied manufacture of iron, the cotton industry is the most extensive in the United States. In September, 1889, the *Financial Review* estimated that the number of spindles in the country was 14,175,000, an increase of over four millions since 1880, and that to keep these running 2,767,000 bales of cotton were used. New England carries on the great bulk of the manufacture, as it is estimated that more than eighty per cent. of the spindles are located within her borders. The chief cotton centres are as follows, naming them in the order of their relative importance: Fall River, Mass.; Lowell, Mass.; Providence, Pawtucket and the Blackstone Valley; New Bedford, Mass.; Manchester, N. H.; Lawrence, Mass.; and Lewiston, Me. On account of the cheapness with which the raw material can be laid down at the mills in that region, the idea has found some acceptance that the manufacture could be carried on to greater advantage at the South than anywhere else in the country. The increase of spindles in some of the centres there, particularly in the neighborhood of Atlanta, Ga., within the last few years, has led some manufacturers to believe that a movement of the industry in that direction had already begun. One of the greatest authorities on all matters relating to the cotton manufacture, Mr. Edward Atkinson, in an article in the *Popular Science Monthly* for January, 1890, says that in his opinion cotton cannot be so successfully manufactured in the South as in New England, because the South has a hot and dry climate, while a large amount of humidity is required in the atmosphere to spin fine numbers. On the other hand, he thinks that as the humidity of the atmosphere, through the influence of the Gulf Stream, is higher along the South shore of New England from New Bedford, by Fall River, on Narragansett Bay and along Long Island Sound, therefore in the future as in the past, the spinning and weaving of cotton will be concentrated in this region. If this is true, and the reasons given are excellent, Providence and Pawtucket are in the centre of this district, and the cotton manufacture has grown up in the region best adapted for its purpose. The cotton manufacture in England is chiefly concentrated in one district in Lancashire, and nearly all the new mills that have been built for several years past have been located at Oldham on the crest of a ridge seven or eight hundred feet above the sea level, where the climatic conditions as to humidity are well adapted to the manufacture.



COTTON GIN.

Cotton is produced in all intertropical regions, both in the old and new world, and is a soft, woolly, fibrous material that is found enveloping the seeds of various species and varieties of the genus of plants known by the botanical name, Gossipium. Through differences in climate and as the effect of cultivation, numberless varieties of the cotton plant exist, but the great botanist, Limæus, only recognized five species, although other botanists have claimed there were eight or ten. A recent investigator on this subject, Professor Parlatore, has found seven primary species, four of which, however, include all the varieties usually cultivated. But for practical purposes the best classification is into herbaceous, shrub, and tree cotton. The herbaceous is the most valuable, as in this class are the varieties from which the great bulk of the crop in the United States and the West Indies is obtained. It is an annual plant and grows from two to five feet in height. Shrub cotton is grown chiefly in India, Egypt, Brazil and the West Indies. In tropical climates it is a biennial or triennial plant, while in temperate latitudes it becomes an annual. The cotton tree is found in India, China, Egypt, and the East Indies. It grows to a height of fifteen to twenty feet, and produces a crop from year to year, but its product as a marketable staple is almost unknown. A warm and humid atmosphere, a sandy soil and nearness to streams, lakes, or to the sea, are necessary conditions to the best results in the cultivation of cotton. While it is indige-

nous to all tropical climates, the plant can be grown in the eastern hemisphere, in Spain, Italy, and the South of France, and in Africa in all parts of that continent, while in the new world its range of cultivation extends from Virginia to Southern Brazil.

The cultivation of cotton, like its manufacture, originated in India, and from thence spread over the rest of the world. In Southern Europe it was introduced and cultivated in small quantities by the Moors, in Spain, in the tenth century, by the Venetians in the fourteenth century, and at the same period by the Turks in Roumelia and Macedonia. Tree cotton was found growing in America when discovered by Columbus, and the inhabitants used it to make clothing, tapestry, carpets, fishing nets, and other articles. Within a very few years after the settlement of Virginia by the English, the cultivation of cotton was begun. The year 1621 is the date given as the time when the first experiment was made, and the success of the attempt attracted attention, not only in the colony but in England. From this period cotton was cultivated, in a small way, "among the rose bushes and honeysuckle vines," in gardens, in Virginia, Louisiana, Georgia, and the Carolinas, and was used almost wholly in domestic manufacture until after the Revolution. There are records of small shipments of a few bags on each occasion having been made from Savannah to England in the years 1739, 1747, 1752, 1764, 1770, and 1784. From 1784 the exports increased year by year. After the invention of the cotton gin in 1793, a great impetus was given to the cultivation of cotton in all the southern states, and as the manufacture increased greater and greater areas were constantly put under cultivation. In 1793 the exports from the United States were 487,600 pounds; in 1794, 1,601,700 pounds. The increase from these figures has been continuous and enormous, and at the present time the exports are about two thousand times as great as in 1794.

COTTON PICKING.

Out of a total of twenty varieties of herbaceous cotton, only two are cultivated in the United States,— Sea Island and the common woolly seed cotton. The latter is generally grown throughout the cotton states. The Sea Island cotton obtains its name from the fact that it is mainly grown on the small sandy islands that extend along the coast of Georgia and the Carolinas, the principal islands being between Savannah and Charleston. The low lands bordering on the sea in the same latitude also produce this variety. It has the longest and finest fibre and most perfect form of any known cotton staple, and is in great demand for spinning fine yarns. On account of its excellence, the limited area on which it can be grown, and the great expense of cultivation, it commands a comparatively high price. This cotton has been spun into yarn so fine that one pound would make a thread more than one thousand miles in length. The upland cotton, grown in the highlands of Georgia, was originally produced from the same seed as the Sea Island, and although it has a much shorter fibre, it is still a very desirable staple.

A MODERN WEAVING ROOM.

The common American cotton, because of "its general uniformity, the skill with which it is cultivated, gathered and ginned, and the excellence of its spinning qualities within the range of counts where by far the largest quantity of yarn is required," is preëminently "the cotton fibre." Other cottons are classed by comparison with it as a standard, and their prices fixed in the markets of the world.

In the United States there are about thirty thousand

square miles under cotton culture, in the following named states: Georgia, Alabama, Texas, Mississippi, North and South Carolina, Arkansas, Louisiana, Tennessee, Florida, Virginia, Missouri, Kentucky, and the Indian Territory, and the present annual production is over seven million bales, of which more than one-half is exported.

The planting of the seed in the American cotton belt takes place from February to May, according to the locality and the season, although March and April are the usual times in the greater portion of the area. In June and July the plants bloom, and the cotton is ready for picking in August, September or October. The seed vessel when ripe bursts open, and the cotton shows in a snow-white ball. Cotton picking is done wholly by negroes, the men being able to pick from two hundred and fifty to three hundred and fifty pounds a day, and the women from one hundred and fifty to two hundred. From the field the lint, as it is called, goes directly to the gin, which separates the woolly fibres from the seeds with great rapidity. The cotton is immediately put up in bales, and is then ready for shipment to Europe, or to the northern mills, while the seeds are sent to the oil mills. The principal shipping ports are New Orleans, Savannah, Galveston, Charleston and Mobile.

LYMAN KLAPP,

THE INVENTOR OF THE COTTON OIL MACHINERY.

Between the Mississippi and one of its tributaries, the Yazoo, is an extensive track of country 6,648 miles square, known as the Yazoo delta, which is considered the best region for the growth of cotton, not only in this country, but in the world. At one end of it Memphis is situated, and at the other, near where the rivers unite, is Vicksburg. There is room here for the entire colored population of the United States. Within the past few years large numbers have migrated here, and at present they form seven-eighths of the population, there being over one hundred thousand negroes in the region.

In the parish of New Iberia, twenty miles west of New Orleans, the native population cultivates a brown or nankeen cotton, which is a variety of the Egyptian, and they work up the product wholly in domestic manufacture, making use of hand-looms and spinning wheels.

India probably produces as much cotton as the United States, but of a very inferior quality, as it has the shortest staple and the coarsest fibre of any known to commerce. The bulk of the crop is used in the domestic manufactures of the country, being made into cloth by the primitive methods already described. A portion of the annual yield is exported to China and adjacent countries. This cotton is also known by the name of Surat.

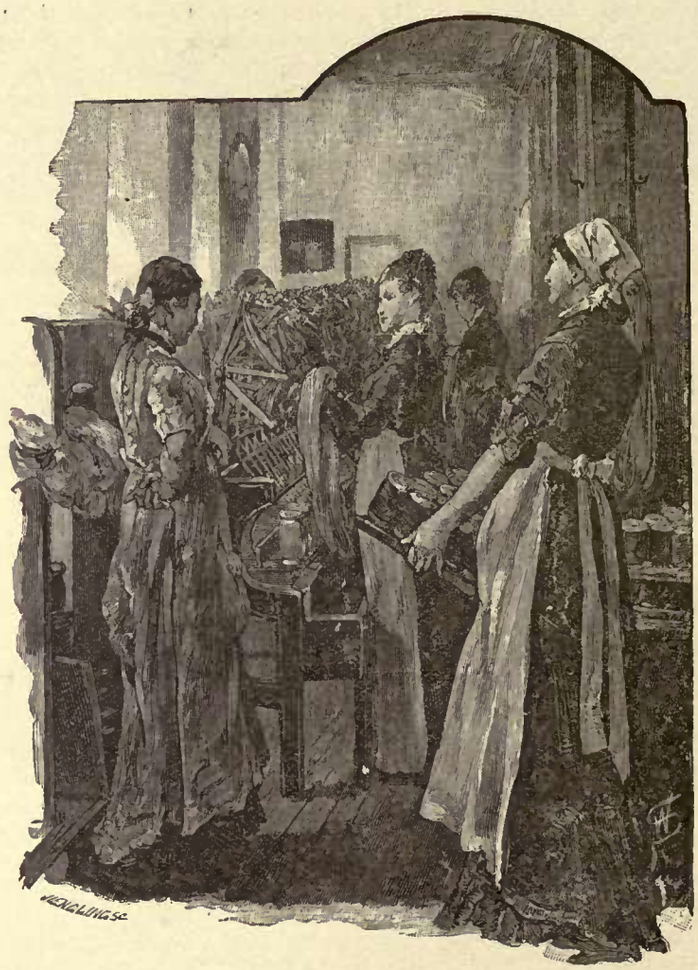
A very good quality of cotton is produced in Egypt, where systematic cultivation was begun in 1821. This cotton ranks next to the Sea Island in quality, fineness and length of staple, but it usually does not come to the market so well prepared and cleaned as American cotton. It is used chiefly by English spinners.

In South America and the West India islands a species of cotton is grown which is usually known either as Brazilian or Peruvian. It comes between the Egyptian cotton and that grown in the United States in length of staple and fineness. Large quantities of this cotton are exported from Brazil to European Countries. Cotton is also grown in China, Japan, in some portions of Australia, in many regions in Africa, and on numerous islands in the South Pacific.

During the War of the Rebellion in the United States, on account of the blockade of the cotton ports by the Federal authorities, the supplies of the English spinners were cut off to such an extent as to create a cotton famine in Lancashire and other manufacturing sections in Great Britain. Attempts were at that time made to improve the average quality of the Indian, Egyptian and other cottons, and to obtain a sufficient supply from those countries, but although American methods were copied, and American cotton seed was planted, the results were unsatisfactory. The principal difficulty in all instances was the extreme variableness of the staple produced and the constant tendency of the seed to revert back to the form of the native plant. Notwithstanding all such attempts, American cotton for general excellence leads all other kinds, and takes the first place in the world's markets.

One of the most wonderful developments in connection with the cultivation of cotton has been the utilization of

the cotton seed, and the growth of the manufacture of cotton seed oil. As early as 1769 oil was extracted from the seed and exhibited as a curiosity. In 1833 a cotton seed oil factory was established at Natchez, Miss., but the process used was so expensive that the business could not be carried on at a profit. The seed was a waste product on cotton plantations, and was either used as fuel, as a fertilizer, or thrown away. In fact, in many instances, it was a question of some importance simply to discover how to get rid of it. These conditions were gradually changed through means of the discovery of a new process of refining the oil, and by the invention of machinery that separated the hulls from the kernals with economy and rapidity, both these desirable ends having been accomplished by Lyman Klapp, of Providence, previous to 1855. Not, however, until after the close of the Civil War in 1866 did the cotton seed oil manufacture increase to any great extent, but since then it has grown to enormous proportions, until it is now one of the principal industries in the country. The material that is left after the oil is crushed out makes an excellent meal, and is put up either in a pulverized form or in cakes. It forms one of the best and most nutritious foods known for animals, for which purpose it is very largely used in this country and exported to Great Britain and all the northern European countries. The oil itself has remarkable properties. When refined it can hardly be distinguished from olive oil, and is considered by some authorities to be equal to the latter as a table oil. This fact led to its extensive exportation to Spain, Southern France and Italy, where after being mixed with olive oil it was reshipped to America as "pure olive oil." To such an extent was this practice carried that in 1881 the Italian government imposed a duty heavy enough to be prohibitory, the effect being almost to destroy the trade. Similar duties have since then been imposed by Spain, but the oil is still allowed to enter the French ports on the Mediterranean as a table oil, unmixed with olive or any other; it is, however, exported to all parts of the globe, and is besides largely used for soap-making, as an important ingredient in oleomargarine, and for many other purposes. It has been estimated that about one-half of the cotton seed oil produced in America is at present used in the manufacture of compound lard.



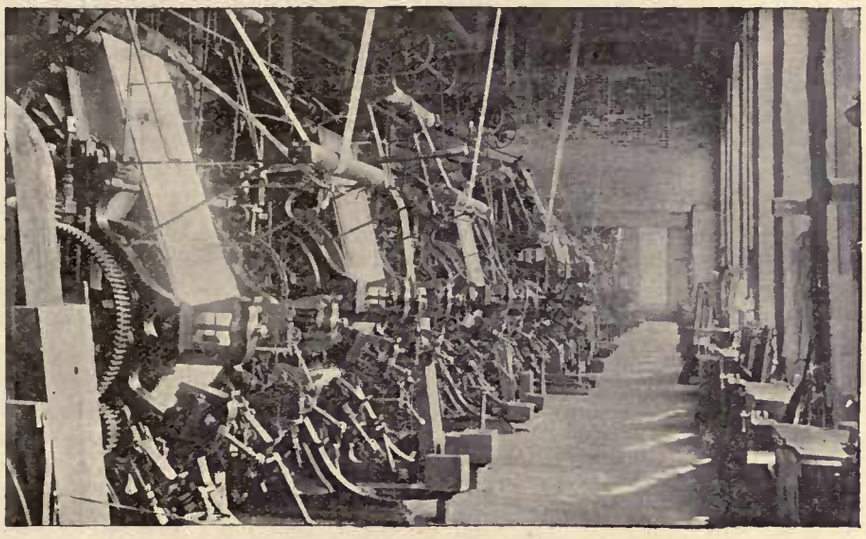
A SPOOLING ROOM.

(WILLIMANTIC LINEN COMPANY. – COTTON THREAD.)

No other series of mechanical processes in use in any manufacture is more wonderful than that by which raw cotton is converted into yarn or cloth. Every operation in a modern factory is almost wholly done by the machines themselves, the human workers, except in the more important and intricate processes, being chiefly attendants or assistants to the mechanism. The adaptation of all the machinery to the end sought, the way in which each machine or process carries the work from its predecessor to its successor, and the almost completely automatic character of the various machines, form a whole that exemplifies in a remarkable degree the beauties of mechanical motion, and at the same time secures results that, as compared with previous accomplishments, far surpass even any imaginings of the human mind. The cotton machinery was practically the first to be systemized and brought to perfection. As it is also probably the most perfectly automatic of any series employed in manufactures, its history is the most interesting of any, and it is the best type of the numerous mechanical inventions now in use in nearly all industries, and which have rendered possible the immense industrial developments of the present century.

Unlike any other fibre, either vegetable or animal, with the exception of silk, cotton can be manufactured without any preparation, just as it comes from the cotton fields. Nature indeed begins the process, as each fibre is slightly twisted on its own axis. The average weight of a bale, in which shape the cotton reaches the mills, is nearly five hundred pounds. When the time has come for the work to begin, the first thing done is to mix several bales together so as to secure thorough blending of the various qualities, and in order that the unevenness in different bales, or in parts of each bale, may be overcome. While the gins in the cotton growing regions have

extracted the seeds, and in a general way cleansed the fibre, still it is not as free from foreign materials as is essential to the successful manufacture Accordingly the first processes are designed to still further cleanse it. The department in American mills where the first stage of this process goes on is the "picker room," so called, doubtless from the fact that in the early days of the manufacture all the cotton had to be picked by hand before it was carded. The machines that perform this work are called pickers or openers, the cotton being passed through a series of blades or bladed beaters which separate the material into small flakes and remove the heavier impurities contained in it, such as sand and seeds. A part of the same set of machinery consists of a winnowing arrangement by which the remainder of the heavier dirt is knocked and blown out of the cotton, and the material is then delivered in the form of a roll or lap. In many mills at present the cotton is put through three and sometimes four sets of pickers and lappers. The lap is then taken to the card. where the fibre goes through a further and more thorough process of cleansing. This machine consists of a large cylinder covered with fine wire teeth, which revolves against smaller cylinders and plates similarly equipped with teeth. The cotton is run in between the cylinders and the plates, and by the combing it receives from the delicate teeth, light foreign materials, such as leaves, dust, short and weak fibres, are extracted. The lap then passes from the card in the form of a long, thin strand, or as it is known in the factories, a sliver, in which the fibres are mainly parallel to one another. Sometimes, according to the fineness of yarn required, the cotton is passed through two sets of cards. These cleansing processes result in the removal of a bulk of about ten per cent., taking American middling cotton as a standard. For yarns finer than 80s a process called combing follows carding, the object being to separate the long from the short fibres.



MODERN CALICO PRINTING.

The attenuated slivers of cotton go directly from the cards to the railway head, which combines from eight to fourteen strands into one and draws them out to many times their original length. According to the fineness of yarn desired the drawing is repeated two or three times, and as a result the sliver becomes very even and silky, the fibres lie parallel with each other and all the curl is taken out of them. The next three processes are conducted by machines known respectively as drawing, slubbing, intermediate and roving-frames, and the cotton passes from one to the other in the order named. The last three of these machines are also called speeders or fly-frames. They are all constructed on the same principle and have the same object in view, namely, the gradual diminution of the thickness of the sliver, which finally becomes so elongated as to require a small amount of twist to keep it from breaking. The English system, which is being introduced in this country to some extent, dispenses with the use of the railway head, the slivers going directly from the cards to the drawing frames. All these processes from the carding to the roving are usually carried on in one department, which is commonly called the carding-room. The material when it leaves the last of these machines is known by the name "roving," and is in condition to be spun into yarn.

Spinning is performed by two styles of machines, the self-acting mule and the ring spinning-frame, whose functions have already been explained. The yarn spun on the frame is chiefly used for warps, while the mule spins filling or weft, although at times its product is also used for warp Frequently the two kinds of spinning are carried on in one department, and where such is not the case they are in close proximity. The yarn spun by the mule is wound on the spindle in the form of a "cop," which is "a cylindrical coil of yarn, cone shaped at each end." In this shape, after steaming, it is ready for immediate use in the loom. The warp yarn, which is spun on to bobbins, has to go through several changes before it is ready for the loom. These changes do not alter the form or character of the yarn, but only put it into a fit condition and proper shape to be readily available. The yarn is transferred by a machine from the bobbins to large spools, and this process is called winding or spooling. These spools are then put in a warper, as the machine is called, and 400 or 500 threads of yarn are wound on a large beam, this process being called either warping or beaming. Several of these beams are then run together, the combined threads passing through a sizing preparation and over heated cylinders, and the threads wound compactly on a smaller beam, which constitutes the weaver's warp. The machines which perform this process are known as slashers. The warp beam being now completed, one thing more remains to be done before it is ready for the

loom, and that is to pass the threads through the reed and harnesses. This work, which is done by hand, is called looming or drawing-in.

Both the warp and the woof being now prepared, weaving begins. The power-loom is a wonderful machine. It performs all parts of the work, and even stops when a thread of filling breaks. If plain cloth is to be woven, the threads of the warp have been drawn in through two harnesses. These are connected with the mechanism in such a way that while one set is up the other is down, and the constantly changing V-shaped space between is called the "shed." Through this space the shuttle travels back and forth, and the reed, a compact framework of thin steel rods, fastened into what is called the "lay," after each journey of the shuttle, forces each thread all along the line into the cloth alongside of its predecessor. All looms operate on the same general principle, but to weave patterns a number of harnesses and shuttles are used, as the intricacy of the pattern demands.

In America all the processes from the mixing of the cotton to the weaving of the cloth are usually carried on in one factory. A different system prevails in England, the spinning and the preparatory processes being carried on in factories similar to the American mills, while the weaving is done in one-story structures, commonly called weaving sheds. A great deal of American yarn instead of being immediately woven into white cloth, is now used in making sewing thread, hosiery, webbing, and for a variety of other purposes. Within recent years in order to supply this demand, which is constantly on the increase, many mills devoted exclusively to the spinning of yarn have been started. These mills also supply the yarn that is used in various descriptions of mixed goods, and which has to be dyed before being worked into the finished product.

The preparing and finishing of cotton cloth and yarn for the market involves a number of operations that have given rise to three great allied industries — dyeing, bleaching and calico printing — which have kept pace with the manufacture of the cloth in the improved methods introduced. At the beginning of the manufacture of cotton by water-power, and for many years after, the bleaching of cotton cloth was a long and tedious process. After being put through some solutions the cloth was spread out on the grass, and months elapsed before the action of the air and the sun finished the bleaching. In the great establishments of the present day the same results are obtained in a few hours. This wonderful saving of time is owing to the discovery of how to prepare and apply chloride of lime, first effected by Charles Tennant, of Glasgow, Scotland, in 1799. The different stages in the bleaching process are, singeing, soaking, boiling, washing, steeping in chloride of lime, and then repeated washings, and the mechanical appliances are only designed to facilitate the movement of the cloth from one stage to another.

The dyeing of cloths has been successfully practiced since the earliest ages, but coincident with the advances in other lines great improvements have been made in the art by the introduction of the use of mordants and a great variety of mineral dyes. The printing or stamping of colors on cloth is a very old art, and is in reality a branch of dyeing. A knowledge of this process was brought from India to Europe about the time cotton was first introduced. Originally the printing was done with wooden blocks, on which the pattern was engraved. The blocks were dipped into the color and applied to the cloth by hand. Cotton cloth thus treated was known as calico, a name supposed to have been derived from Calicut, a town in the province of Malabar, India. A Scotchman named Bell discovered, about 1785, a method of printing from copper cylinders, on the outer surface of which the pattern was engraved. This gave a great impetus to the business, and also encouraged the manufacture of cotton cloth. Before the cloth is printed it has to be bleached. Some of the modern printing machines can put on from a dozen to twenty colors at once, each color being applied to the surface of the cloth by a different cylinder, and all together forming the pattern. Nearly all the cloth printed is afterward dyed, a class of dyes called mordants being used for this purpose, which have the effect of bringing out or intensifying and at the same time fastening the color put on by the printing machines. The finishing process, both in dyeing and bleaching, is known as calendering, and is performed by large cylinders heated by steam, over which the cloth passes rapidly. This has the effect of smoothing and straightening the cloth so that it is ready to be packed and sent to market.

The story of cotton as briefly outlined in these pages is the most wonderful of that of any industry. The development of the manufacture was so unusual as compared with any event that had preceded it, and the cultivation of the plant spread in this country over such an extensive area that both in Europe and America as a result new social and political conditions were evolved. While the "factory system," made necessary by all the processes of manufacture being combined under one roof, has usually been condemned as the cause of many evils, yet there is good reason to think, as Carroll D. Wright says, that it "has not affected society as badly as has generally been believed; and if in its introduction it has brought evils to light, it has at the same time not only sought to remove them, but has done much to remove others." The opinion has been advanced that the invention of the cotton gin rendered the labor of the negro so valuable in the South that in order to retain the profit of his services the war of the rebellion was waged. That there is some truth in this cannot be denied, but as in the case of the manufacture the end of the struggle has resulted in a condition where the benefits outweigh the disadvantages. In a large sense, this great industrial development has brought immense benefits and blessings to the human race.

Chapter II.

SAMUEL SLATER, AND THE INTRODUCTION OF COTTON SPINNING INTO AMERICA.

Attempts of the British Government to Prevent the Establishment of Manufactures in America — First Spinning Jenny and Early Cotton Manufacturing at Philadelphia — The "State's Models" at Bridgewater, Mass. — Beverly Factory — Beginning of Manufacturing in Rhode Island — Unsuccessful Experiments with Machinery — Moses Brown Purchases the Machines and Starts Almy & Brown in Business — Samuel Slater — His Early History and Training — Arrives in America — Hears of Moses Brown and at his Invitation goes to Pawtucket — Builds the Arkwright Machines from Recollection, and Starts Them December 20, 1790 — Enters into Partnership with Almy & Brown — The Old Mill Started — Sewing Thread First Manufactured — Extension of the Manufacture by Slater and his Partners at Pawtucket, Slatersville and Webster — Slater's Enterprises in Other Lines — His Financial Embarrassment in 1829 — His English Property — Visits of Presidents Monroe and Jackson to Pawtucket — Slater's Marriage — His Family — The Wilkinsons — Slater Establishes Sunday Schools — His Character, Accomplishments and Personal Appearance.

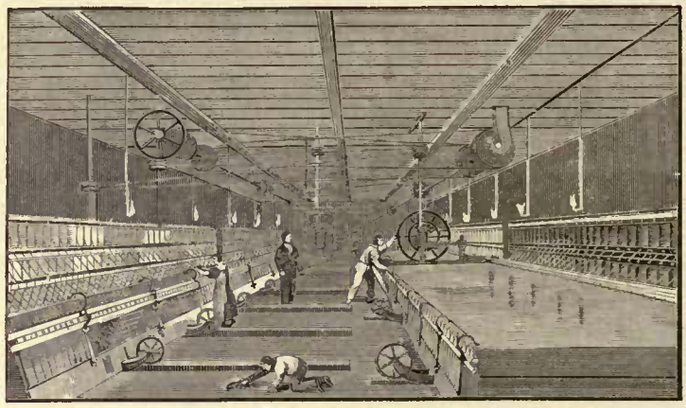
Accounts of the wonderful new machines for the spinning of cotton had reached America within a short time after they had come into use in England, but owing to a peculiar combination of circumstances they were not successfully introduced into the United States until more than a score of years after Arkwright had obtained his first patent.

During the colonial period the British Government had done everything in its power to discourage manufacturing in America. By this course two objects were sought: First, to keep the colonists in dependence on the mother country, and, second, to provide a market and insure profits to English merchants and manufacturers. While in a measure both these ends were secured, the irritation produced was so great as to be one of the chief causes of the Revolution. During the war, and after the recognition of the United States as an independent government in 1783, the same results were sought to be obtained by making it an offence punishable by a fine of £200, twelve months imprisonment and the forfeiture of the goods, to export "any machine, engine, tool, press, paper, utensil or implement, or any part thereof, which then was or thereafter might be used in the woolen, cotton or silk manufactures of the kingdom, or goods wherein wool, cotton, or silk were used, or any model or plan thereof." This law was rigidly enforced. The Honorable Tench Coxe, a prominent citizen of Philadelphia, who had been a delegate to Congress from that city and afterward assistant secretary of the treasury, exerted himself to a great extent in trying to introduce cotton manufacture at the North, and cotton culture at the South. In furtherance of these designs he ordered a complete set of brass models of the Arkwright machinery, but the customs officers discovered them, all completed and packed, as they were being carried on board ship, in the year 1786, and in accordance with the law they were forfeited. A German who had in 1784 made up a party of English workmen to go to Holland and there establish manufactures was fined £500. Many other attempts to carry machinery or take workmen out of the country were detected and prevented by the British authorities. By this means the American people were for years effectually prevented from acquiring a practical knowledge of the new inventions.

BELFRY OF THE OLD SLATER MILL.

The first spinning jenny in America after the model of the machine invented by Hargreaves is supposed to have been one constructed by Christopher Tully, which was exhibited and operated in Philadelphia in 1775. In

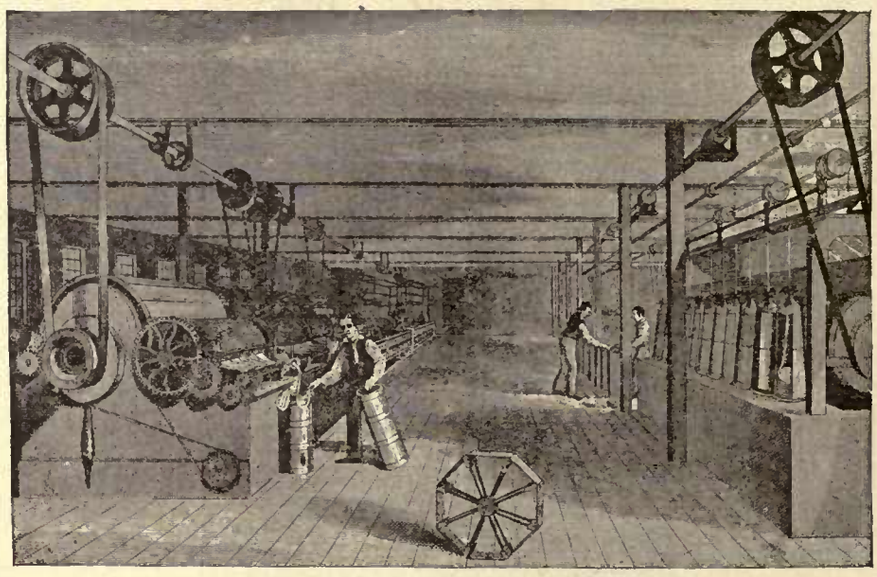
the early part of the same year "The United Company of Philadelphia for Promoting American Manufactures" was organized, and at the first general meeting of the subscribers to the stock Dr. Benjamin Rush, who had been elected president, made an address. The manufacture was immediately begun, Mr. Tully's spinning jenny, it is thought, having been secured. November 8th Mr. Coxe became a member of the company, and from that time exerted a great influence in promoting the success of the enterprise and in advancing manufacturing in general. At the end of two years the goods manufactured consisted of linens valued at £1,443, and cottons and woolens worth £474. Eventually this business passed into the control of Samuel Wetherell, Jr., who had been the manager. During the war he furnished clothing on contract for the Continental Army, and seems to have continued as a manufacturer from that time. The Arkwright machinery played no part in this enterprise, most of the spinning being done by hand, and the cloth was woven in private houses. In 1787 the "Pennsylvania Society for the Encouragement of Manufactures and the Useful Arts" was organized, and seems to have been a revival of the "United Company." Samuel Wetherell, Jr., was chairman and manager of the concern. In a report by him August 23, 1788, it appears that up to that time capital to the amount of £1,327 had been paid in, £453 had been expended for machinery, between two and three hundred women were employed in spinning yarn, and "a carding engine, four spinning jennies, of 40, 44, 60 and 80 spindles, for spinning cotton" had been constructed and were in operation, while 26 looms had been set at work. The goods produced were: "jeans, 2,959½ yards; corduroys, 197½; federal rib, 67; beaver fustian, 57; plain cottons, 1,567½; linen, 725; tow linen, 1,337½—total 7,111 yards." The building where this manufacture was carried on was burned on the night of March 24, 1790, the evidence showing that it had been fired by an incendiary.



HAND-MULE SPINNING.

(From an old Print.)

In 1786, two brothers, Robert and Alexander Barr, Scotch mechanics, were employed by the Honorable Hugh Orr, at Bridgewater, Mass., to construct a spinning jenny, stock card, and roping machine. These machines were examined by a committee of the Massachusetts legislature, on whose recommendation £200 was awarded the brothers for the purpose of completing the machines, and the following May they were awarded six tickets in the State land lottery, in which there were no blanks, as a reward for their ingenuity. The cost of the machines was £189. They were left in care of Mr. Orr, who was allowed to use them in consideration of explaining their use and method of operation to all who might desire to inspect them for the purpose of profiting thereby and engaging in the manufacture. The claim has been made that these machines were the first spinning jenny and stock card made in America after the Hargreaves models.



CARDING, DRAWING, ROVING AND SPINNING,

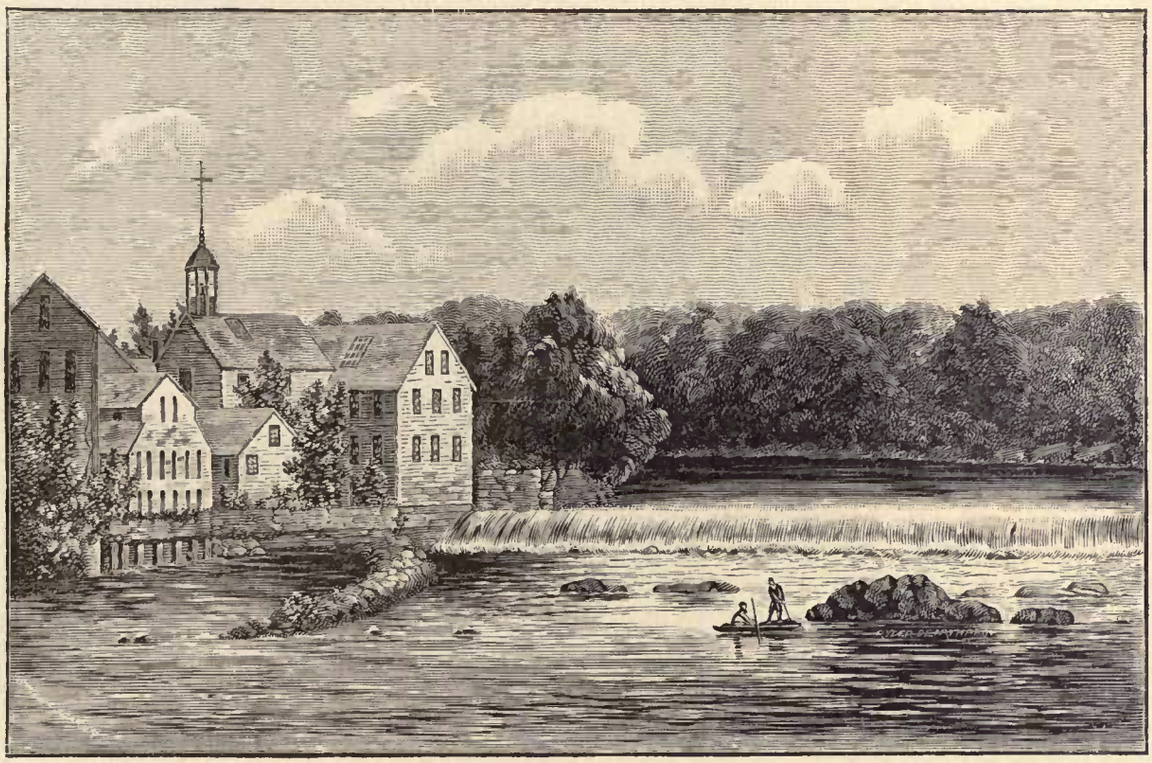
AS INTRODUCED BY SAMUEL SLATER, 1790.

(From an old Print.)

While this machinery was being constructed Thomas Somers, who had obtained a knowledge of cotton machines in England in 1785 and 1786, petitioned the Massachusetts Legislature for assistance to construct machinery and begin the manufacture. He was granted £20 and the money was put into the hands of Mr. Orr, of Bridgewater, who was directed to superintend the affair. Mr. Somers constructed an imperfect form of the Arkwright water frame, which,

with the other machines, was exhibited by Mr. Orr, and all these machines came to be known as the "State's Models." There is no record that Mr. Orr ever used these machines to any extent in carrying on the manufacture, but persons from various portions of New England came to Bridgewater, and making drawings attempted the manufacture with machinery constructed after these models.

A cotton factory was started in 1787 on the Bass River at Beverly, Mass., of which John Cabot and Joshua Fisher were managers. The machinery used here is supposed to have been made from the State's Models, although the managers, in their petition to the Massachusetts legislature asking assistance, stated that a carding machine had cost them $1,100 and could then



VIEW OF THE OLD SLATER MILL IN 1840.

LOOKING NORTH FROM MAIN STREET BRIDGE.

be purchased for $200. This statement has given rise to the opinion that this machine had been imported, but there is no proof that such was the case. The spinning machinery consisted of several jennies. In response to their petition the legislature made the concern a grant of £1,000 in 1790 "to be raised in a lottery," but notwithstanding this assistance the enterprise was not successful. The imperfection of the machinery, the waste occasioned by the ignorance of the workmen, and the lack of finish of the goods as compared with European fabrics, all operated to render the undertaking a failure, and the business was eventually discontinued.

The earliest attempt to manufacture cotton by machinery in Rhode Island was made in the year 1788 by Daniel Anthony, Andrew Dexter and Lewis Peck, who had formed a partnership to make "homespun cloth." Their intention at first was to spin by hand, but learning of the models in Mr. Orr's possession at Bridgewater they obtained drawings of the machines and constructed a jenny of twenty-eight spindles, a carding machine and a spinning frame of thirty-two spindles. Two Scotch weavers, James McKerris and Joseph Alexander, who understood the use of the fly shuttle, arrived in Providence the same year, and they were engaged by Mr. Anthony and his partners to weave corduroy. A loom was set up in a room in the "market house," where the other machinery was in operation, and a piece of corduroy was woven by Mr. Alexander, the warp being linen and the filling cotton spun on the premises. As no one could be found who knew how to cut the corduroy, raise the pile and finish the cloth, the weaving was discontinued after the first piece was completed, and Mr. Alexander removed to Philadelphia. Mr. McKerris went to East Greenwich, where he worked as a handloom weaver for some years.

These spinning and carding machines, although they had been constructed by the most skillful mechanics of the time in Providence, were very clumsy contrivances, so that Anthony, Dexter and Peck soon gave up attempting to operate them, and sold them to Moses Brown. Another spinning frame, made after the State's model at Bridgewater, was set up at East Greenwich, but the experience with it was similar to that with the machines at Providence, and it also was purchased by Moses Brown.

While these experiments were going on, John Fuller, an Irish stocking weaver, set up a loom at East Green-

wich, but not finding things to suit him there removed to Providence and sold his loom to Moses and Smith Brown, who employed him to operate it. The business was soon abandoned, however, as it was found unprofitable.

Moses Brown in purchasing all these machines had the laudable desire, as he himself says, of "perfecting them, if possible," and establishing the cotton manufacture on a sound basis. Not wishing to engage directly in the management of the business he passed it over to his son-in-law, William Almy and "a kinsman," Smith Brown, who carried it on with his capital under the style of Almy & Brown. This firm, as soon as these machines were secured, or at least soon after, probably came into possession of the business that Anthony, Dexter and Peck had established, or tried to establish. The machinery was removed to Pawtucket with the idea of operating it by water-power. Almy & Brown began business June 11, 1789, and up to the first day of January, 1790, had manufactured 189 pieces, containing 4,556 yards of mixed cotton and linen goods. In 1790 the production continued at about the same rate, as in ten months and a half 326 pieces, containing 7,823 yards, were made, and the goods were known as velverets, thicksets, corduroys, fancy cords, royal ribs, denims, jeans and fustians. All the weaving and the greater part of the spinning was done in private houses, the looms and jennies being placed in the cellars or in apartments on the first floors. The two spinning frames were run for a short time after being taken to Pawtucket, and 150 skeins of cotton yarn had been made by them, but the expense of doing this was more than the yarn was worth. At the end of the year 1789 the machines owned by Almy & Brown were the two spinning frames, which were not running; two spinning jennies, one of eighty-four and the other of sixty spindles; a doubling and twisting jenny, and a stock card. As has been seen, the frames could only be run at a loss, and they produced yarn of a poor quality. The other machines were almost equally poor and unprofitable to work. In effect, Almy & Brown were carrying on the manufacture of cotton by the methods that had been in use for many years, and their attempt to spin cotton by machinery was a decided failure. They were not alone in this experience, as no other endeavor in the same business had been successful. Consequently, during the latter part of the year 1789, although the Arkwright machinery had been for years in successful operation in England, no machine after the Arkwright model was or had been spinning cotton at a profit in the United States. This result was not due to a lack of enterprise but rather to the great difficulties of the undertaking in the face of all the obstacles that stood in the way.

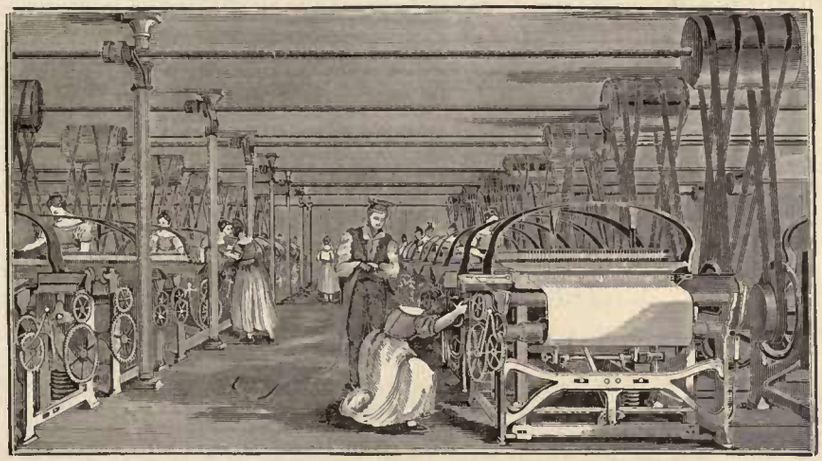
JOHN SLATER,

BROTHER OF SAMUEL SLATER AND FOUNDER OF SLATERSVILLE.

While affairs were in this condition and there seemed no likelihood of a change, a young man who was destined to develop the manufacture was on his way from England to America. He came fully equipped for the work that he afterward performed. While to others may be awarded the credit of having made the first attempts and experiments in cotton manufacturing by machinery, to him alone belongs the great honor of not only constructing the first complete Arkwright machines in America, but of first conducting the manufacture at a profit, developing it and educating the pioneer manufacturers. This young man was Samuel Slater. He was born in the town of Belper, Derbyshire, England, June 9, 1768, and was the son of William Slater, a substantial yeoman, who owned a small estate named "Holly House," cultivated his own land and did business as a timber merchant. Samuel was the fifth son. At the age of fourteen, June 28, 1782, he went to live with Jedediah Strutt, who, in connection with Richard Arkwright, had erected a factory at Milford, about a mile from Belper. Mr. Strutt was the inventor of the ribbed stocking machine, and was one of the two original partners who furnished capital to start Arkwright's first factory. For about six months young Slater remained on trial, and January 8, 1783, he was regularly indentured to Mr. Strutt as an "apprentice in the art of cotton spinning," to serve six and a half years. During the period of probation his father fell from a load of hay and received injuries that resulted in his death.

Young Slater had received an excellent practical education, "wrote well and was quick at figures," which indeed were the reasons that induced his father to put him instead of the eldest son with Mr. Strutt. For the whole period of his apprenticeship he applied himself diligently to the business, and developed so much capac-

ity that the last four or five years he had a general oversight both of the manufacturing department and of the machine shop, where the machinery was constructed. During the last two years of his apprenticeship his attention had been attracted by newspaper accounts of the prevailing anxiety in America to have the cotton manufacture established there, and he had evidently carefully laid his plans to emigrate as soon as he was free. His time was up early in August, 1789. Without acquainting either his family or Mr. Strutt of his ultimate destination, he left his home for London September 1st, and the 13th of the same month sailed for New York, arriving there in November, after a passage of sixty-six days. Previous to his departure he mailed a letter to his mother telling her of his intentions and destination. He immediately commenced work with the New York Manufacturing Company, but its machinery consisted only of one card, two machines, and two spinning jennies, which he did not consider "worth using."

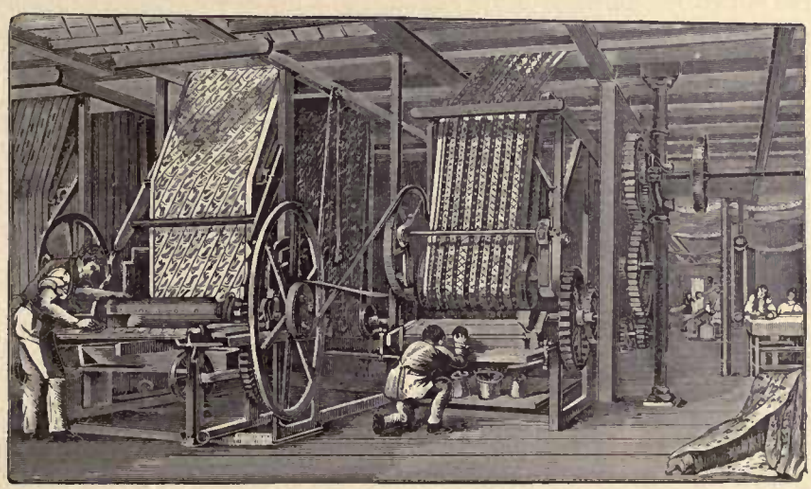


POWER-LOOM WEAVING EARLY IN THE CENTURY.

(From an old Print.)

Before Mr. Slater had been in New York two weeks he, through the captain of one of the Providence packets, heard about Moses Brown and his attempts to manufacture cotton by machinery. He wrote to Mr. Brown December 2d, offering his services as "a manager of cotton spinnings" and claiming that he also could construct the Arkwright machinery. In the same letter he said that he had had "an oversight of Sir Richard Arkwright's works and in Mr. Strutt's mill upward of eight years." To this Moses Brown replied by a letter dated December 10th, inviting Mr. Slater to come to Providence, and promising to give him, if he should perfect the machines and run them successfully, all the profit "over and above the interest on the money they cost, and the wear and tear of them for six months," and also holding out to him the inducement of having "the credit as well as the advantage of perfecting the first water mill in America."

Mr. Slater left New York for Providence early in January 1790, and the 18th of the month, in company with Moses Brown, he went to Pawtucket. When he saw the machines in Almy & Brown's shop he at once pronounced them unfit for the work, and also said that they could not be made perfect. He thereupon undertook to construct the Arkwright series of machines, and an agreement was made that he was to receive one dollar per day for his services, and have a man to assist him, who was to be put under bonds not to steal the patterns or disclose the nature of the work. Sylvanus Brown, a skilled mechanic, was engaged as the assistant, and he and Mr. Slater, behind locked doors and screened windows in a small building on the easterly side of the present East Avenue, then known as Quaker Lane, began their task. Owing to the law already referred to, prohibiting the exportation of plans or models of machinery from Great Britain, he had to rely entirely on his memory in the work of construction, as the only document he had brought with him from England was his indenture with Mr. Strutt. For the direction of Sylvanus Brown he made drawings with chalk on wood of the Arkwright machines as he remembered them, and slowly, piece by piece, the first frames were constructed.



CALICO PRINTING EARLY IN THE CENTURY.

(From an old Print.)

When the work had progressed sufficiently to show that Slater understood what he was about a new agreement was drawn up. This was dated April 5, 1790, and practically formed a partnership between William Almy,

Smith Brown and Samuel Slater, for the purpose of engaging in "the spinning of cotton by water." That this agreement was insisted upon by Mr. Slater as a condition of proceeding with the work is quite likely. Many indications lend color to the opinion that his ability to construct the machinery was doubted at first. He was a very young man, only 21 years of age, and the fact that he had no documentary evidence except his indenture to substantiate his claim naturally caused distrust. Moses Brown asked Sylvanus Brown, in whose house Mr. Slater passed his first night in Pawtucket, and who had drawn him into conversation on the subject: "Does the young man seem to know anything about spinning cotton?" The reply was that he had great confidence in himself and seemed to understand a great deal about the matter. The agreement of April 5th shows that this distrust still existed, by using the following language when speaking of the spinning of cotton: "of which the said Samuel professes himself a workman well skilled in all its branches." By this agreement Mr. Slater undertook to build "two carding machines, a breaker, and a finisher; a drawing and roving frame; and to extend the spinning mills or frames to one hundred spindles." He was to receive one-half of the profits after every expense arising from the business was defrayed, including a commission of 2½ per cent. for purchasing the stock and 4 per cent. for disposing of the yarn, and was also "to be at the expense of his own time and board." Almy & Brown were to turn in all the clumsy and defective machines they had acquired "at the price they cost them," and were to furnish the material for the building of the new machinery, but Slater was to be accountable for one-half of all the expense "that hath arisen or shall arise" from the building of the machinery or the conducting of the business in all its phases. He was also bound not to dispose of his share or any part thereof to any one without the consent of the other partners in writing; but after he had paid one-half of the cost of the machinery with interest he could sell out, provided he first offered his portion to Almy & Brown "in writing, upon the lowest terms." Almy & Brown were to purchase the stock and sell the yarn, but for this they were to receive commissions, as above stated.

While this agreement gave Mr. Slater a definite standing, as he became a partner instead of an employé, it was not especially favorable to him. He assumed a much greater risk than the other partners. Not only did his wages depend entirely on his success, but if he failed he would be in debt for his living expenses and, more than all, he would be dishonored and discredited. The other partners only risked their money. They were to be paid for their individual labor, were to receive one-half the profit, and were to be repaid by Slater one-half the cost of the useless experimental machinery. To accept such conditions Slater must have had great confidence in himself and in the future of the industry. He was amply justified by the results. From an old account, dated December 3, 1792, it appears that in accordance with this agreement Mr. Slater's share of the proceeds of the business for less than two years of actual manufacturing amounted to more than four hundred pounds.

The constructing of the machines occupied much more time than was at first anticipated. Not until the 20th of December was everything completed so that the whole series could be operated. This delay was not at all surprising in view of the entire absence of models or plans. Even tools to work with could not readily be obtained, but had to be made by Mr. Slater, or under his direction. The principal difficulty was with the cards. "After the frames were ready for operation, he prepared the cotton, and started the cards; the cotton rolled up on the top cards instead of passing through the small cylinder." This failure disturbed Mr. Slater exceedingly, so that for many days the Wilkinson family where he boarded thought he was sick. He realized that if this machine would not work he would be thought an imposter, while nearly a year's labor would be thrown away. After consulting with Phinney Earl, a mechanic who had constructed the machine under his direction, it was perceived that the teeth of the cards were not crooked enough, and the general finish, on account of clumsy tools and poor material, was very defective. By beating the teeth with a piece of grindstone they were given the proper inclination, and when the machine was started it worked successfully

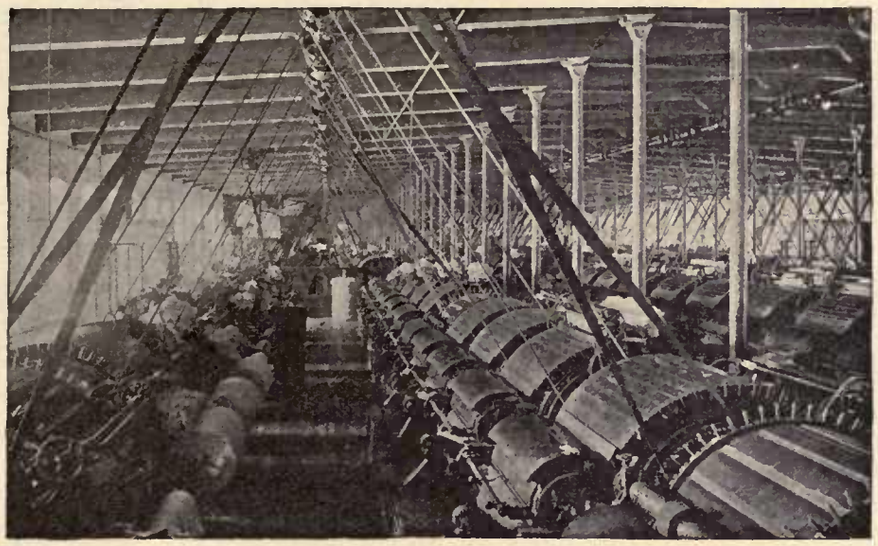
This incident, having something of the character of a dramatic climax, gave rise to the story that the way to perfect the machinery was revealed to Mr. Slater in a dream. Wide credence was given to this story, and it became a fireside tradition. Mr. Slater, however, denied it, and gave the facts to his biographer substantially as above stated.

The machinery that was started December 20, 1790, consisted of three cards, drawing and roving machines, and two spinning frames, one of twenty-four and the other of forty-eight spindles. In an old building, situated on the southwest abutment of Pawtucket bridge, which had been used as a fulling mill, and was furnished with a water-wheel, the machine purchased from David Anthony, Andrew Dexter and Lewis Peck by Moses Brown, had been set up by Almy & Brown, before Mr. Slater's arrival. In this same structure the new machinery was started and continued in operation about twenty months. This edifice was washed away by the great freshet of February 15, 1807.

So much yarn was produced by the improved method of spinning that, in the latter part of the year 1792, although "every exertion had been made to weave it up and sell it," several thousand pounds were on hand. Moses Brown, with characteristic prudence, wished to stop work for awhile when about five hundred pounds had accumulated, as he was afraid that Slater would spin all his farms into cotton yarn. In deference to his wishes it is probable that the machines remained idle for some time between the expiration of the "twenty months" that they were operated in the old fulling mill, and the starting of the old factory. The first week Mr. Slater set four persons at work,—Arnold and Charles Torpen, Smith Wilkinson and Jabez Jenks; the following week four more were employed, Ennise Torpen, John and Varnus Jenks, and Otis Borrows; the third week Ann Torpen commenced, and the fourth week the same nine

were employed. Thus, at first, the entire cotton manufacture by the Arkwright machinery in America was carried on by Mr. Slater and nine assistants, who were nearly all young children.

The water-wheel in the old fulling mill was so exposed during the two winters the manufacture was carried on in that building that it was frequently frozen, and on these occasions Mr. Slater would spend several hours breaking the ice. In this way he laid the foundation for rheumatism and other chronic disorders that afflicted him in his later years. Early in the year 1793, Almy, Brown & Slater began the erection of a factory specially designed for the business. On the twelfth of July the machinery was set in motion. This was the first cotton mill on the American continent in which all the processes of the improved Arkwright cotton-spinning and preparatory machinery were carried on under one roof with proper detail and completeness. The same machinery was used that had been run in the old fulling mill, but more spindles were added as the sales of yarn increased. This factory, which has been famous for many years as the "Old Slater Mill," still stands in Pawtucket, but not as it at first appeared. Several times it has been enlarged in height, width and length, and the original timbers and frame form part of the existing edifice. It is quite likely that the dyeing, bleaching and finishing of yarns and cloth were carried on in this building, as these branches were all necessary parts of the manufacture. The weaving, however, was all done in private houses on hand looms, the cloth being returned to the factory to be dyed or finished. Yarn was sold to weavers in the adjacent parts of Rhode Island, Massachusetts and Connecticut. It is said that it was in the old mill in the year 1794 that the first cotton sewing thread was manufactured. Mrs. Slater called her husband's attention to the beauty and evenness of the yarn made from some Sea Island cotton, and suggested that it could be made into a good sewing thread. The experiment was tried, and a good strong thread was made which, when tested, was found to be stronger than a linen thread. From this beginning the business spread to other countries, but Pawtucket has always been a centre of the thread manufacture.



VIEW OF A MODERN CARDING ROOM.

In company with Oziel Wilkinson, his father-in-law, Timothy Green and William Wilkinson, also sons-in-law of Oziel Wilkinson, Mr. Slater formed the firm of Samuel Slater & Company in 1798, in which he held a half interest. The erection of a mill was soon after begun on the east side of the river almost opposite the first factory, but the machinery was not started until some time in 1801. This was the first spinning mill in Massachusetts that operated successfully the Arkwright machinery; consequently to Slater belongs the credit of starting the first mills in both Rhode Island and Massachusetts. Mr. Slater was superintendent of both mills, and received in each case a dollar and a half per day for his services, making his wages three dollars. He attended strictly to his business, and it is said that for twenty years he labored sixteen hours daily. Mr. Slater sold out his interest in this factory, which was commonly known as the White Mill, in 1810, to the other partners, who conducted the business under the style of Wilkinson, Greene & Company. The mill was burned in 1824 but was rebuilt by Timothy Greene & Sons.

John Slater, a brother of Samuel, arrived from England in 1803. He brought with him a knowledge of the spinning mule invented by Crompton. In 1805 a new enterprise was projected, Almy, Brown, and the two Slaters each taking a fourth interest, and during 1806 the erection of a mill was begun in the northern part of the State on the south branch of the Blackstone River. The mill was finished and began operations in 1807, John Slater being superintendent. This was the beginning of the village of Slatersville. John Slater eventually bought out all the other partners, and the mills and village are now the property of his grandson John W. Slater.

In 1811, in company with a young man named Bela Tiffany, who had been in his employ a number of years, Samuel Slater started a cotton factory at Oxford, Mass., now known as Webster, situated about thirty-five miles northwest from Providence. An excellent water-power was furnished by French River and several ponds. At first the business was conducted under the name of Slater & Tiffany, but soon came wholly into Mr. Slater's possession, and ultimately was carried on under the style of Samuel Slater & Sons. The property in 1817 consisted of one cotton factory of 2,000 spindles, a woolen mill, a grist and saw mill, sixteen

dwelling houses and 700 acres of land. In 1831 the cotton manufacturing plant had increased to 6,000 spindles and 90 looms, 180 hands were employed, and 15,000 yards of yarn were produced weekly besides large quantities of satinet warp and sewing thread. Broadcloths, cassimere and satinets were woven and 180,000 pounds of wool were consumed yearly. During his later years Mr. Slater spent the greater part of his time at Webster, Mass., where he died April 21, 1835, in his 67th year. Through Mr. Slater's influence three villages that had grown up from his enterprise, together with some territory from the towns of Dudley and Oxford, were in 1832 incorporated as the town of Webster, and named after Daniel Webster. Webster is still in the hands of the Slater family, H. N. Slater, grandson of Samuel, being the president of both the cotton and woolen companies that carry on business in the place.

The war of 1812, by shutting out foreign goods, gave a great impetus to domestic manufacture, and as Mr. Slater had all his various enterprises well under way, he was enabled to reap great advantage. Cotton cloth sold at forty cents a yard, and the demand was unlimited. Besides the interests he possessed in the mills already mentioned he invested capital in the woolen and iron manufacture and in various other ways. In 1822 with Willard Sayles and Lyman Tiffany of Boston, Oliver Dean of Franklin and Pitcher & Gay of Pawtucket, Mr. Slater formed a company, purchased an estate consisting of a small cotton mill, several tenements and a fine water-privilege at Amoskeag Falls, on the Merrimack River. This was the foundation of the well-known Amoskeag Manufacturing Company, and the real beginning of the great manufacturing city of Manchester, N. H. Previous to engaging in this enterprise Mr. Slater, with his wife and his son Horatio N., had visited Amoskeag Falls with a view of purchasing the property, and on the journey thither passed through Chelmsford where he saw laborers at work blasting rocks and laying the foundations for the future city of Lowell. In July, 1823, the cotton mill at Jewett City, Conn., which had been started in 1813 but had not been operated successfully, was purchased by Samuel and John Slater, who carried on the business successfully. Samuel Slater sold his interest in this property July 10, 1831, to his brother John, in whose family it is still owned. Mr. Slater was "a principal agent in promoting the famous road from Pawtucket to Providence, the Gore turnpike to Webster, and the Worcester and Norwich turnpike, and was in favor of the project of the Norwich and Worcester Railroad." His name stands first in the original charter of the Pawtucket Institution for Savings, granted in 1828.

Mr. Slater's business continued to increase constantly. Such was the careful manner in which he conducted his affairs that, although he was doing an enormous business for the times, he did not owe a thousand dollars, while he had fifty thousand in mortgages on real estate. Disaster, however, overtook him during the financial crisis of 1829 when, on account of the failure of a number of concerns in Pawtucket, principally his first wife's relatives, the Wilkinsons, whose paper he had heavily indorsed, he was obliged to ask for an extension of time. His partner, William Almy, had hesitated about giving him assistance, and this Mr. Slater construed as a refusal. A meeting of wealthy men was held in Providence, at which Mr. Slater gave an inventory of his property, which amounted to $690,000, while he was liable for about $300,000. Through the efforts of Cyrus Butler, Brown & Ives, Moses Brown, and others, an arrangement was made whereby he could go on with his business. He sold his third in the Old Mill at Pawtucket and his fourth in the Slatersville property to William Almy. In a much shorter time than was expected he settled his affairs and paid off his indebtedness, but at the cost of a very considerable loss of property. The incidents connected with this affair tried Mr. Slater severely, and in the opinion of Mr. White, his biographer, "his mind and feelings were very essentially affected, and he never fully recovered his tone and assurance." He afterwards repurchased his interest in the Slatersville property and in 1833 he and his brother bought out Almy & Brown's interest.

In 1827, Mr. Slater in company with others started a mill in Providence, containing seven or eight thousand spindles, and operated it with a steam engine. This was the first mill of the kind in the state and one of the first in the country, and it was commonly known as the "Steam Mill," until very recently. On account of the complication of his affairs in 1829, as no one would purchase this mill and those at Wilkinsonville, in Sutton, Mass., in which he was interested in company with David Wilkinson, Mr. Slater found it necessary to take these concerns entirely into his own hands. The "Steam Mill" proved successful and after 1830 experienced judges said that it produced the finest goods in the country.

Slater was possessed of property in England valued at $2,000, which was his portion of the estate left by his father. This property, consisting of two houses in Belper, he retained in his possession for some years after coming to America. On one occasion a box of clothing sent him in payment for the rent of one of these buildings was detained at New York on account of the duty not being paid, and this incident gave rise in some way to the story that an attempt had been made to assassinate Mr. Slater by sending him an infernal machine from England.

While on a tour of New England in 1817 President Monroe visited the Old Mill. He was received by Mr. Slater, who exhibited the machines and explained the methods of manufacture to him and his suite. President Jackson visited Pawtucket during his first term of office. Slater at the time was laid up with rheumatism, a consequence of exposure in starting the water-wheel of his first machinery. After viewing the machinery the President went to Slater's house to show respect to the man whom he called the "Father of American Manufactures." The following unique conversation is said to have occurred: "I understand," said the President, "you taught us how to spin, so as to rival Great Britain in her manufactures; you set all these thousands of spindles at work, which I have been delighted in viewing, and have made so many happy by a lucrative employment."

"Yes, sir," said Slater, "I suppose that I gave out the psalm, and they have been singing to the tune ever since." "We are glad to hear also that you have realized something for yourself and family," said the vice-president. "Yes, sir, I have obtained a competency." "We are all glad to hear that." "So am I glad to know it," said Slater, "for I should not like to be a pauper in this country, where they are put up at auction to the lowest bidder."

The Old Mill, at Pawtucket, from the first was the point to which a great many English mechanics directed their steps as soon as they arrived in America. Slater always befriended them, procured them immediate employment if possible, furnished them with money to go to other places and in general acted as a directing spirit and counselor. Not only to his fellow countrymen were these qualities displayed, although naturally to them his heart was warmer, but to all who were struggling to obtain a foothold in this work-a-day world he was ready to extend assistance. At the same time he was no believer in the indiscriminate and unwise charity that tends to destroy self respect and make dependent paupers. He has been quoted as saying: "Direct charity places its recipient under a sense of obligation which trenches upon that independent spirit that all should maintain. It breaks his pride, and he soon learns to eat the bread of idleness without a blush. But employ and pay him and he receives and enjoys with honest pride that which he knows he has earned, and could have received for the same amount of labor from any other employer."

When he first arrived at Pawtucket in 1790, Moses Brown introduced Mr. Slater to Oziel Wilkinson, at whose house he went to board. Mr. Wilkinson had five sons and several daughters. When Moses Brown brought Slater to the house two of the daughters, Martha and Hannah, were at home. Impelled by a feeling of modesty they ran out of the room; "but Hannah lingered with curiosity and looked through an opening in the door. Samuel saw her eyes and was interested in her favor. He loved at first sight, but it was sincere, it was permanent; nothing but death could have severed the ties which endeared him to Hannah Wilkinson." Her parents being Quakers they did not at first wish to consent to their daughter marrying out of their own sect, and thought of sending her away to school, but Slater discovering their intention said: "You may send her where you please but I will follow her to the ends of the earth." Martha, the elder sister, when she saw that the young Englishman preferred Hannah, was very much vexed and said to her mother that it would be disgraceful for her sister to marry any one not a member of the society of Friends. To this the mother quaintly replied, "Martha, thee is only mad because Samuel does not want thee, thyself." Samuel Slater and Hannah Wilkinson were married October 2, 1791, after the cotton machinery was an assured success. Nine children were born to them: William, August 31, 1796, died January 1, 1801; Elizabeth, November 15, 1798; Mary, September 28, 1801; Samuel, September 28, 1802; George Bassett, February 12, 1804; John, May 23, 1805; Horatio Nelson, March 5, 1808; William, October 15, 1809; Thomas Graham, September 19, 1812. Within two weeks after the birth of Thomas Graham, Mrs. Slater died, October 2, 1812, aged 37 years, 9 months and 17 days. Five years later, November 21, 1817, Mr. Slater married Mrs. Esther Parkinson, widow of Robert Parkinson, of Philadelphia. She had for years been an acquaintance of the family and was a valued friend of the first Mrs. Slater. There were no children by this marriage, but it resulted happily, and the second wife proved a good and worthy mother to the children. She survived her husband many years, and died at the Slater mansion on East Avenue, Pawtucket, December 23, 1859, aged 81 years.

His marriage to Hannah Wilkinson, bringing him as it did into close relations with the Wilkinson family, resulted in great mutual advantage. Oziel Wilkinson and his sons were the most skilled mechanics of the time, and rendered exceedingly valuable assistance to Slater in the construction of his machinery. With the Wilkinsons he also found a home, and their people became his people. On the other hand through means of Slater the Wilkinsons engaged in the cotton manufacture and in the construction of machinery and he aided them to an almost unlimited extent with his capital. In fact, it was his indorsements for David Wilkinson and for A. & I. Wilkinson that occasioned his financial embarrassment in 1829.

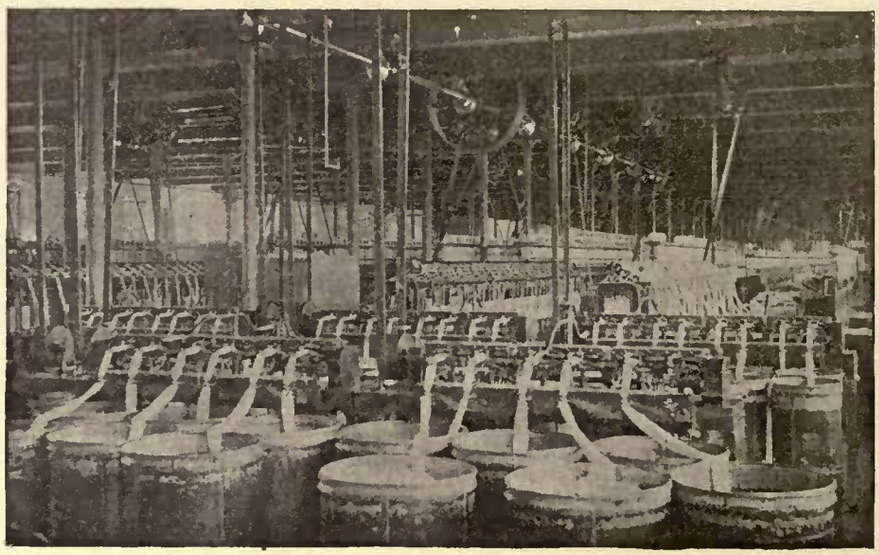
Mr. Slater was undoubtedly of a serious and religious cast of mind. He was one of the founders of St. Paul's Episcopal Church, and on a massive marble tablet in the present edifice of that body is the following inscription:

SAMUEL SLATER,
SON OF WILLIAM,
A PUPIL OF ARKWRIGHT & STRUTT,
WAS BORN
AT BELPOR, DERBYSHIRE, ENGLAND,
JUNE 9, 1768:
ESTABLISHED, AT PAWTUCKET,
THE FIRST COTTON MILL
AND THE FIRST SUNDAY-SCHOOLS
IN AMERICA, 1790:
WAS ONE OF THE FOUNDERS,
AND THE FIRST SENIOR WARDEN,
OF THIS CHURCH:
ADORNED THE CHRISTIAN CHARACTER
BY A PIOUS AND EXEMPLARY LIFE;
AND CLOSED
HIS EMINENT AND USEFUL CAREER,
IN PEACE AND HOPE,
APRIL 21, 1835.

THIS MEMORIAL
WAS ERECTED BY HIS SURVIVING CONSORT,
ESTHER SLATER,
IN TESTIMONY OF HER AFFECTION.

As soon as Mr. Slater found that his business in the old mill collected young children he opened a Sunday-school like those he had seen in connection with Mr. Strutt's works at Belper. This school and its immediate successors were not religious, but in them the children were taught the common branches. It was probably the first, or at least one of the first, Sunday-schools in Amer-

ica, after the plan of Robert Raikes, introduced in England in 1781. The idea was so excellent that Mr. Slater was assisted by his partners and by Oziel Wilkinson in carrying it out. Sometimes he taught the children himself, but usually some young man was employed who was paid by Almy, Brown & Slater, as the accounts show. Other manufacturers, both in Pawtucket and elsewhere, introduced the same system, and a great impetus was thereby given to the cause of education generally. The schools came ultimately under the control of the churches and became religious instead of secular in their teachings. The Sunday-schools of the First Baptist Church and of the St. Paul's Episcopal Church, in Pawtucket, are direct descendants of these first-day schools, as they were called by the Quakers.



DRAWING FRAMES IN A MODERN CARDING ROOM.

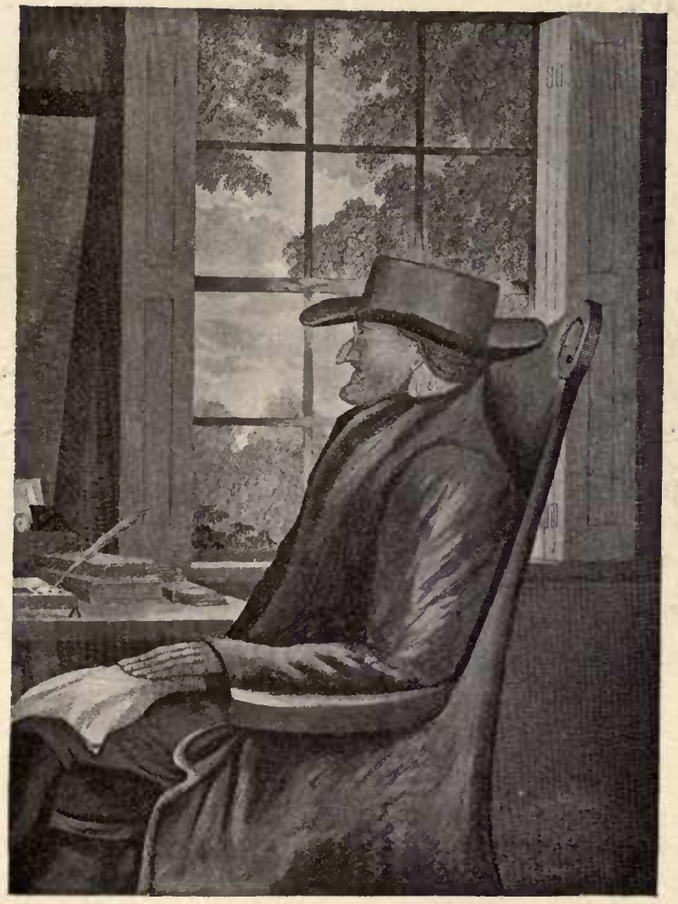
To achieve the great success that he accomplished, in the face of the obstacles he encountered, Mr. Slater must necessarily have had many pronounced qualities of character. Perhaps the most prominent traits were his unremitting industry and an unwavering, steadfast perseverance in any line of effort in which he had once engaged. He was very exact and conscientious in all his business dealings, believed in keeping his own contracts to the letter and expected others to do the same. He was a stern disciplinarian, demanding conscientious service, but rewarding it well. Interesting evidences of his strictness are the narratives that have come down to us of how he used to cane the boys who worked for him in the Old Mill, when they neglected their work or were guilty of some offence, and the fact that there were no complaints of undue violence, but that the community, the parents and the boys themselves offered no objections, indicates that the effect and purpose of Mr. Slater's chastisements were recognized to be in the interest of good morals and proper business conduct. He made no attempt to keep himself prominent in the public eye, but was always modest and unassuming, and "was never known to boast of anything relating to himself whether of property or abilities." His business occupied so much of his attention that he had little time to devote to other affairs. Some of his letters, however, which have been preserved and published, exhibit excellent qualities of mind, show that he was fully informed on history and on great general questions, especially those relating to business, and that he was a shrewd observer and was possessed of a dry, caustic humor. In his later life, according to the testimony of his second wife, "he had improved himself by much reading of the best authors in the English language." Both in his business and in the conduct of his household Mr. Slater avoided show and display, spending nothing but what was necessary for comfort or utility. The records of his life and works are so meagre in comparison with what he accomplished, that it is only from detached references and by reasoning on general principles that an estimate of his character can be formed. A correct summary of the man arrived at in this way would probably be that in manner he was quiet, unassuming and modest, in character honest, conscientious and of the strictest integrity, in conduct exact, punctual, decisive, with indomitable perseverance and energy. All these qualities, and others he may have possessed, undoubtedly fitted him to do the work he did, and which as far as events have shown no other man could have performed as well at that time.

In personal appearance Mr. Slater is described as having been "tall, fully six feet in height, his usual weight about 260 pounds. He was of light complexion, his features were regular, his forehead was broad and high, his expression intellectual, and his bearing commanding."

Chapter III.

THE PIONEER AMERICAN MANUFACTURERS.

The Mills at Pawtucket Training Schools for the Early Manufacturers — Extension of the Industry after 1807 — First Factories in Various Parts of the Country — Power Looms Constructed by Francis C. Lowell and put in Operation at Waltham — Founding of he City of Lowell — "Scotch Loom" Introduced by William Gilmour, at Lymansville, R. I. — Consequent Great Increase of the Manufacture — Number of Mills and Extent of Operations at Different Epochs — Improvements in Machinery — Introduction of the Self Acting Mule by William C. Davol of Fall River — The Invention of Ring Spinning — Moses Brown, and his Preliminary Work — Obadiah Brown — William Almy — Starting of Mills at Centerville and Crompton — Gen. Christopher Lippitt — William Sprague — Dr. Stephen Harris — Simon Henry Greene — Zachariah Allen — Thomas J. Hill — Thomas Fletcher — Other Rhode Island Pioneers — Beginning of the Manufacture at Fall River, Manchester and Lawrence — Samuel Batchelder — Unknown Inventors.



MOSES BROWN,

PHILANTROPIST, MERCHANT, PATRON OF SLATER AND THE EARLIER MANUFACTURERS. FOUNDER OF THE FRIENDS' SCHOOL.

As has already been related, although numerous endeavors were made in various parts of the United States previous to Slater's arrival to spin cotton by the Arkwright methods, no one had succeeded in perfecting the machinery and conducting the manufacture profitably. The two mills at Pawtucket were the original schools in which all the successful manufacturers either learned the business themselves, or from which they obtained their managers and skilled workmen and the patterns of their machinery. Up to 1807 all the cotton mills in the country were erected by men who had learned to build and operate machinery in these factories. Many of the first attempts were failures, chiefly, no doubt, on account of the limited experience of the projectors. The number of mills in the United States in 1804, according to Bishop's History of American Manufactures, was four. This statement probably means that only that number were successfully using the Arkwright machinery and doing a paying business. Without doubt all these mills were within the present limits of Rhode Island.

About the year 1807 the business began to extend throughout the country. At the close of that year there are said to have been fifteen mills in the United States, and at least ten of these were in Rhode Island. At the end of the year 1809, according to returns made to the Secretary of the Treasury, Albert Gallatin, eighty-seven mills had been erected in the whole country, sixty-two of which were in operation, while the other twenty-five were expected to start in the course of the year 1810. These mills had a total capacity of 80,000 spindles, no more in number and far less in capacity than many single modern factories. The machinery was generally constructed on the premises, each factory having a machine shop in the basement or in an adjacent building. Of these establishments fifty-two were in New England. The total consumption of cotton in the year 1805 in the United States was a little more than 1,000 bales. In 1816, more than ninety thousand bales were manufactured, and $40,000,000 was invested in the business. The operations of the mills up to 1817 were confined to the spinning of yarn, which was sent out both in webs and as filling to be woven by the hand-loom weavers. It is thought that John Slater brought a knowledge of the spinning mule to Rhode Island, and up to the time of its introduction the "water frame" had been used to

spin both kinds of yarn, but after that period the mule, because of its capacity for finer work, was used to spin the filling.

In 1809 there were seventeen mills in operation in Providence and vicinity, with seven in course of erection. During the year these mills had consumed 640,000 pounds of cotton, and produced 510,000 pounds of yarn, while 1,100 hand looms were employed in weaving the yarn into ticking, stripes, checks, ginghams, shirtings, sheetings and counterpanes, which were considered equal in appearance and superior in durability to English goods. In 1812 there were, within thirty miles of Providence, fifty-three factories with over 100,000 spindles, of which 58,000 were in operation. Of these factories thirty-three were in Rhode Island and twenty in Massachusetts.

OLIVER CHACE,

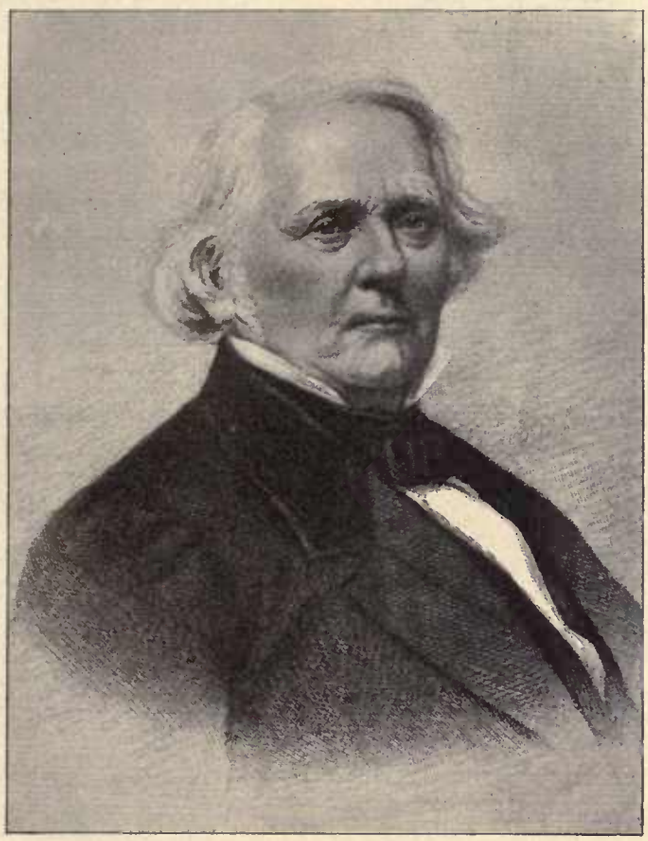
FOUNDER OF TROY MILLS, FALL RIVER, 1813.

The first cotton factory in the state of New York was started in 1804 at Union Village, Washington County, by William Mowry, who had learned the business at the mills in Pawtucket. A mill was started at New Ipswich, N. H., in 1804, and a second factory was erected in 1807. Early in 1806 a mill was built in Connecticut on the Quinebaug River, in the town of Pomfret, by a company composed of Oziel Wilkinson, his five sons, two sons-in-law, and the three Rhodes brothers, James, Christie and William, all from Pawtucket, and some of them associated with Slater in other enterprises. Smith Wilkinson, the youngest of the brothers, conducted the enterprise successfully for many years. A mill was built by the Maine Cotton and Woolen Company at Brunswick, Me., in 1807. Factories were started at Watertown, Fitchburg and Medway, Mass., in 1807; at Dedham in 1808, at Waltham between 1807 and 1809, and at Dorchester in 1811. In New Hampshire at the end of 1811 there were probably fifteen mills operating six or seven thousand spindles. The Union Manufacturing Company, of Maryland, began to manufacture cotton on the Patapsco River, ten miles from Baltimore, in May, 1810. During the same year mills were started at Derby, Conn., at Chicopee, Mass., and at various places in New York state. Two cotton mills were started at Fall River, then known as Troy, in 1813. A great impetus was given to the development of the cotton manufacture throughout the country by the almost complete stoppage of importations occasioned by the war of 1812.

There were in operation in 1813, in Rhode Island, 120,000 spindles. "In and near Providence," according to a memorial to congress, the number of factories was reported to be, at the close of the year 1815, as follows: In Rhode Island 99 mills, with 75,678 spindles; in Massachusetts 57 mills, 45,650 spindles; in Connecticut 14 mills, 12,886 spindles,—a total of 170 mills and 134,214 spindles. The average capacity of mills at that period was only 500 spindles. The Old Mill at Pawtucket up to this time was the largest in the country, containing 5,170 spindles.

Accounts of Cartwright's power loom and of its improvement into an effective machine reached America early in the century, but the laws that had prevented Slater from carrying plans of the Arkwright machinery out of the kingdom stood in the way of its introduction in this country. A loom was constructed by Mr. Francis C. Lowell, of Boston, and put in operation in the factory of the Boston Manufacturing Company, at Waltham, in 1814. Mr. Lowell had visited England in 1810–11, and although it is not certain that he saw the perfected power loom in operation, he became familiar with its general principles. Paul Moody, a skilled mechanician, was engaged to build the machines after Mr. Lowell had perfected the working model. The loom was copied in its essential features from a plate in a book by John Duncan, and the lay was operated by a cam and weight instead of by a crank as in the so-called Scotch loom. To Mr. Lowell's ability and genius the starting and developing of the factory at Waltham was mainly due. This mill was the first in the world in which all the processes of the manufacture were carried on under one roof from the raw cotton to the finished cloth. With Mr. Lowell were associated in this enterprise his brother-in-law, Patrick Tracy Jackson, the Honorable Nathan Appleton, and others. Mr. Lowell died September 2, 1817, at the age of 42. His family has for generations been famous in the state and nation. James Russell Lowell, the poet, is a nephew of Francis C., and John Lowell, who established the well-known Lowell Institute and lectures in Boston, was his son.

The combination of all the processes under one roof at Waltham was the result of Mr. Lowell's calculations and management, and the saving in expense thereby secured was the chief cause of the great profits this establishment reaped while other mills were either idle or making no money during the business depression following the peace of 1815. Such was the success of the Waltham enterprise that the proprietors determined to extend their business. Accordingly, Mr. P. T. Jackson, the Honorable Nathan Appleton, with Mr. Kirk Boott, and others, organized the Merrimack Manufacturing Company, and in 1822 began the erection of a large factory on the Merrimack River at East Chelmsford. In honor of Mr. Lowell the place was renamed, and this was the beginning of the great cotton manufacturing city of Lowell. The first mill was started in September, 1823. The success of this enterprise was so pronounced that capital was attracted to the locality and many new mills were rapidly erected within the next few years. For many years Lowell was the leading cotton manufacturing centre in the United States, but since the War of the Rebellion Fall River has forged ahead. Lowell is, however, a good second. The superior character of the workers in the early Lowell mills as compared with English operatives at the same time is a matter of history. The story of their life and surroundings has been told by themselves in the pages of the famous magazine called the *Lowell Offering*, while Lucy Larcom and other writers have also given views of the conditions then and there existing. This state of affairs was due to the careful and wise plans of the projectors of the factories and to the circumstances and previous environment of the people themselves.



DAVID ANTHONY,

FOUNDER OF THE FALL RIVER MANUFACTURING COMPANY, 1813.

Although the Waltham loom was a success it was not equal to the improved loom in use in England and Scotland. A Scotch mechanic named William Gilmour, who was familiar with the loom as originally constructed by Cartwright and with all the subsequent inventions and improvements, came to America in 1814. He had in his possession patterns of the perfected loom and dresser as used in Scotland. John Slater invited Gilmour to Slatersville, and wished to engage him to build the machines, but the other partners, owing to the depression in business then existing, were opposed to the experiment. Judge Daniel Lyman, who had borne a conspicuous part in the Revolutionary War, started a small factory early in the century on the Woonasquatucket River in North Providence. He had been experimenting for several years with power looms without obtaining satisfactory results. He heard of Gilmour and, in company with other manufacturers, engaged him to build looms and dressers. Twelve looms were constructed under Mr. Gilmour's instructions and in accordance with his patterns, the work being accomplished in about sixty days, at a cost per loom of $70. They were put in operation in the factory at Lymansville in 1817. Mr. Gilmour was paid $1,500 for his services and the use of his patterns, and David Wilkinson at his machine shop began the manufacture of the machines, and supplied the factories in Rhode Island and adjoining regions. The Scotch loom, as this machine was commonly called, was much superior to the Waltham machine, but not until ten years after it had been introduced into Rhode Island was it adopted at Waltham or Lowell. The common cotton loom in use to-day is this machine developed and improved, with some minor additions, but in principle essentially the same. Gilmour's loom completed the manufacturing system in Rhode Island as the hand-mule was already in use. In this respect the Rhode Island manufacturers were a decade ahead of their contemporaries.

The introduction of the power loom gave a strong impetus to the cotton industry. Looms were put in the existing factories, and a great saving in labor was thereby effected, as the necessity of carrying the yarn out to weave was done away with. In 1823 the number of factories in the vicinity of Providence and adjacent parts of Connecticut and Massachusetts was estimated at 100. Among the largest were the establishments of Almy, Brown & Slaters, at Slatersville, with 116 power looms and 6,000 spindles; the Blackstone Manufacturing Company, at Mendon, Mass., with 150 looms and 6,000 spindles; and the Coventry Manufacturing Company, at Anthony, in the Pawtuxet valley, with 4,000 spindles and 72 looms. In the year 1829 there were in Rhode Island 139 factories, of which the towns of Warwick and

ZACHARIAH ALLEN,

INVENTOR, PHILOSOPHER AND MANUFACTURER. ORIGINATOR OF THE MANUFACTURERS' MUTUAL INSURANCE SYSTEM.

Smithfield each had 20. The remainder were probably chiefly located in the Blackstone valley. In 1825 the number of spindles in the United States was estimated at 800,000. The number of cotton factories in the whole country in 1826 was thought to be about 675, of which 400 were in New England, and they averaged about 700 spindles each. The new mills, however, were quite large, while the majority of the old ones were very small. Each spindle at that period is supposed to have worked up about one hundred and forty pounds of cotton annually, mostly in very coarse numbers. After 1830 the average capacity of mills was largely increased, the new mills having from four to six thousand spindles. Continued enlargement has been the order of the day down to the present, so that although the number of distinct establishments is probably not more than twice as great as in 1826, the mills are immensely larger, the number of spindles has increased twenty fold, and the production in a much greater ratio. Immense advances have been made in the effectiveness of the machinery, so that one spindle does as much work as several in 1830, and nearly all the machines have been made more thoroughly automatic, requiring much less attendance. The number of cotton factories in the United States was 801 in 1831, 1,240 in 1840, and 1,074 in 1850. The growth since then is shown by the following table:

	1860.	1870.	1880.
Factories, . .	1,091	956	1,005
Looms, . . .	126,313	157 810	229,784
*Spindles, . .	5,235,727	7,132,415	10,713,677
Operatives, . .	122.028	135.369	185,472
Capital, . . .	$98.586.260	$140,706,291	$219,505.794
Wages, . . .	$23,938,236	$39,044.132	$45,614,419
All materials, .	$57.285.534	$111 736 936	$113,765,537
Products, . .	$115,681,774	$177.489 739	$210,950,383

*The number of spindles in 1889 has been estimated to be 14,175 000.

An interesting story is told of the difficulties encountered in securing the first self-acting mule from England. This machine was manufactured under the patents of Richard Roberts, by the firm of Sharpe, Roberts & Company, in Manchester. In 1838, Mr. William C. Davol and Major Bradford Durfee, of Fall River, went to England for the purpose chiefly of obtaining a knowledge of the improvements in cotton machinery. Mr. Davol was so much impressed with the self-acting mule that he purchased a machine from the manufacturers, and made an arrangement with the inventor for securing patents in America, and engaging in the construction of the machine under a royalty. Before leaving England, however, he learned that the mule could only be delivered in the yard of the works, as the laws that had prevented Slater from carrying models of mechanical improvements out of the kingdom were still in force, at least in a modified form. He was directed to an agent in Liverpool who made a verbal agreement to ship the machine as soon as possible, and with this assurance Mr. Davol and Major Durfee returned to America. The machine did not arrive, however, as expected, and although many letters were written to the English firm and the Liverpool agent two years elapsed before it reached America. It then came in a vessel from Havre as an invoice of small metal ware packed like plate glass in broad thin cases, and its framework and every part of any size was in pieces a few inches in length. Mr. Davol succeeded in putting these pieces together with great patience and after much trouble, but was rewarded by having the first complete self-acting mule in America in his possession. With his partners, under the style of Hawes, Marvel & Davol, he began the manu-

EDWARD HARRIS,

FOUNDER OF THE HARRIS WOOLEN COMPANY, WOONSOCKET.

facture of this machine, for which a great demand almost immediately sprang up in all the cotton centres. An attempt was made to deprive Mr. Davol of the fruits of his enterprise, but although a strong combination was formed against him his rights were sustained by the courts.

Great improvements were made by American mechanics in the spinning frame invented by Arkwright, and introduced in this country by Samuel Slater. The first in the order of time was the invention of the ring and traveler, a device to guide the thread to the bobbin, and to aid in giving a twist to the yarn. This supplanted the flyer or throstle, which previously had given the name to the entire machine. In 1828 John Thorp, of Providence, R. I., a very ingenious mechanic, invented this improvement, which consisted of a thin piece of flat steel wire bent like the letter O that "traveled" on the upper surface of a highly polished metal ring. This ring encircled the spindle, and by the action of the mechanism was moved up and down the whole extent of the bobbin, by this means the yarn being wound thereon. When first invented the ring frame was very crude, but within a few years it was perfected by William Mason, the founder of the Mason Machine Works at Taunton, who was also the inventor of an American type of the spinning mule, and of a number of lesser but very valuable improvements in cotton and woolen machinery and locomotives. Ring spinning has supplanted the throstle not only in America but is in general use in England. Great changes have been made in the form and style of spinning frame spindles chiefly by American inventors. The spindles on Samuel Slater's machines were twenty-four inches in length while the bobbin was only four inches, and their highest speed was 2,500 revolutions per minute. The improved spindles in use to-day are but little over ten inches long, with a bobbin of six inches, and they can be run at the rate of 10,000 revolutions a minute.

A great deal of credit is due to some of the Rhode Island contemporaries of Slater for their labors and enterprise as pioneers in establishing the cotton manufacture. Next to Samuel Slater himself the man who accomplished the most in bringing about the introduction of the Arkwright machinery was Moses Brown. He realized the importance of the new inventions as his purchase of all the early experimental machinery testifies; he was the means of bringing Slater to Pawtucket; with his capital and by his advice the first machines were built, and he exercised a fatherly and protecting care over the infant enterprise. Moses Brown was a descendant of Chad Brown, an associate of Roger Williams and one of the first settlers of Providence. He was the youngest of the "Four Brown Brothers" who exercised such a commanding influence in all lines of life during the last half of the eighteenth century in Providence and Rhode Island. Born September 23, 1738, he became, when 25 years of age, a partner with his brothers in the commercial house founded by his father and uncle and which, as the great manufacturing firm of Brown & Ives, is still conducted by their descendants. He retired from the firm in 1773, on account of feeble health, and thereafter devoted himself to study. About the same time he joined the Society of Friends and during the Revolution held himself aloof from all participation in popular movements. After the war he interested himself in education and in trying to introduce manufacturing. The exalted quality of his character is well illustrated by

THE OLD SLATER MILL IN 1890.

Photographed by Salisbury.

the fact that in 1773 he freed his slaves. As soon as he heard of the "young man from England" he invited him to come to Providence, as he recognized the fact that a person skilled in the business was imperatively needed to perfect the machinery and conduct the manufacture. Although never actively engaged as a direct partner in any manufacturing enterprise, still throughout his life by the investment of his money and by wise and practical suggestions he probably did more to promote the establishment of the industry than many men who were concerned in the actual work. Not only was he anxious for the material results but, as some of his letters show, the moral effect of the factory system gave him great concern, and in connection with Slater and others he gave his support to the establishing of Sunday and day schools in the factory districts. He died September 6, 1836, within sixteen days of his 98th birthday, full of years and honor.

DR. NATHAN DURFEE.

AN EARLY MANUFACTURER OF FALL RIVER.

Obadiah Brown, the only son of Moses Brown, became a partner in the firm of Almy, Brown & Slater very early in the history of the business. New articles of partnership had been drawn up in 1803, and, by an agreement made February 19, 1819, Slater received $5,000, and each partner continued to hold an interest of one-third. Samuel Slater and Obadiah Brown seem to have formed an especial friendship for each other. Obadiah Brown died October 15, 1822, and his will named Slater as executor. At the time of Slater's embarrassment in 1829, when he was so severely tried by the refusal of some of his friends to help him, he observed to Mr. White: "I should not have been so tried if Obadiah Brown had been living." William Almy married the only daughter of Moses Brown. He was a partner of Slater for nearly forty years, from 1790 to 1829, at which time the Old Mill came into his exclusive possession. He died February, 1836, at the age of 75.

A mill was started at Centreville in Warwick in 1794, by William Potter, John Allen, Job Greene and others, but proving unsuccessful, a half interest was purchased by Almy & Brown in 1801, and under their management it proved a paying venture. This mill was on the west side of the river. In 1807 a factory was built on the east side, the chief owners of which were John and Gideon Greene. This mill became the property of Benedict Lapham in 1852. In 1871 Mr. Lapham erected the present large and handsome stone factory. He was a very successful manufacturer. He died in 1883 and was succeeded by his brother, Enos Lapham, who was Lieutenant Governor of the State in 1888–9.

Soon after the starting of the White Mill on the Massachusetts side of the river at Pawtucket in 1801, some of the workmen became dissatisfied and five or six of them left and started a mill on the Abbott Run in Cumberland, at a place called Robbin Hollow. The property and water-privilege here were owned by Elisha Waterman and Benjamin S. Walcott, who erected a small factory for these men. The original mill, which was the third in the country, was burned about 1830. At present the village and factory here are known as Cumberland Mills.

On the south branch of the Pawtucket River, about a mile above Centreville, a small stone cotton mill was erected in 1807 by the Providence Manufacturing Company, the members of which were Seth Wheaton, Thomas Sessions, John K. Pitman, Henry Smith, Nathaniel Searle, Jonathan Tiffany, Benjamin Remington and William Rice. In 1800 this region was covered with a dense wood. The original company failed in 1816. In 1823, after some changes in ownership, Seth Wheaton, Edward Carrington, and Benjamin Cozzens acquired the property, formed the Crompton Company, and called the village by the same name, in honor of Samuel Crompton, the inventor of the spinning mule. These mills, fitted up with all modern improvements, are still run under the name of the Crompton Company, and are owned by the Richmond family.

During the first years of the century many of the mills built in Rhode Island were very small. Farmers who had a brook running through their land, especially if it had a good fall, put up mills with the idea that they would get rich rapidly by spinning cotton. It is related that Joseph Tiffany built such a factory near Crompton village, in Warwick, and "one day when the machinery was running full speed all at once the wheel almost stopped. The help ran out to see what the matter was. They found a cow drinking the water that ought to run

the wheel. When the cow had quenched her thirst the wheel started up again at full speed."

General Christopher Lippitt, one of the most famous of Rhode Island's sons during the Revolution, in company with his brother Charles, Benjamin Aborn, George Jackson, Amasa Mason and William H. Mason, formed the Lippitt Manufacturing Company in 1809 and erected a mill on the north branch of the Pawtuxet River in 1810, naming the new village, thus founded, Lippitt. The same year the Roger Williams Mill was built by a company of the same name at the village now known as Phenix, the members of the company being Daniel Baker, William Baker, Samuel Baker, William Harrison, Reuben Whitman, Elisha Williams and John S. Williams. The Lippitt and the Roger Williams mills were each finished on July 4, 1810, the builders striving to outdo each other. In 1821 the Roger Williams mill was burned. It was rebuilt in 1822 by Timothy and Samuel Greene and Benjamin Harris, the name of the company and place being at the same time changed to Phenix. After several changes of ownership the village and mills came ultimately into the possession of the Hope Company, one of the branches of Brown & Ives.

Henry P. Franklin engaged in the cotton manufacture and started the Union Mills in Olneyville early in the century. In company with his nephew, John Waterman, in 1812 he built the Merino Mill, and started 1,500 spindles. Some of the earliest experiments with power looms were, according to Zachariah Allen, carried on in this mill. In March, 1812, John Thorp put in operation in this factory a vertical power loom he had invented and patented. It however was not a success on account of the imperfect system of dressing the warps, and also for the lack of a stop motion to prevent the smashing of the warp when the shuttle failed to go through the web to its place in the box.

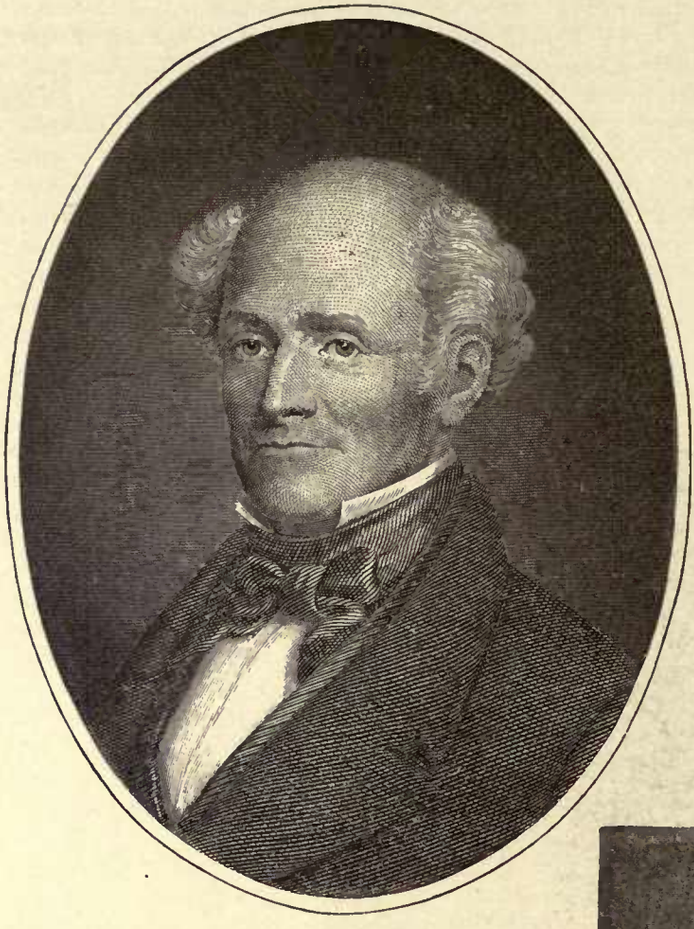
Christopher and William Rhodes started manufacturing both cotton and woolen goods at Bellefonte, in the first years of the century, about a mile from the mouth of the Pawtuxet River, and here they are said to have woven the first broadcloth in the country. In the fall of 1807 a mill 80 feet long, with two frames of 84 spindles and two mules of 200 spindles each, was built at Natick by a company composed of Captain William Potter, Charles Potter, Christopher and William Rhodes, Jonathan Ellis, Perez Peck and others.

RICHARD BORDEN,

A PIONEER MANUFACTURER OF FALL RIVER.

William Sprague was one of the earliest cotton manufacturers in Rhode Island. In 1808 he started a spinning mill at Cranston, and thus founded the immense business carried on by his family for three generations. He started the business of bleaching, printing and dyeing calicoes at Cranston in 1824. In 1825 in company with Christopher and William Rhodes he purchased the water-privilege at Natick, and the partners built a stone mill of large size for the times. This property was from time to time enlarged and in 1852 passed into the hands of William Sprague's sons, William and Amasa, who formed at their father's death, the firm of A. & W. Sprague. Two mills were built by the firm at Quidnick, in Coventry, in 1849, and in 1852 a mill was built at Arctic. For miles the Sprague properties extended in Warwick and Coventry, in the Pawtuxet valley, and consisted not only of the mills, but of the villages and extensive tracts of lands. William Sprague, the son of the founder of the family, was governor of the state 1838-1839, and United States Senator 1842-1844. His brother Amasa was murdered in 1843, the motive for the deed, it is supposed, being his activity in advocating and promoting temperance. The sons of the murdered man, who were also named Amasa and William, on the death of their uncle succeeded to the management of the business, their cousin Byron being an inactive partner. William Sprague, of the third generation, was elected governor of Rhode Island in 1860. He put forth great exertions in raising troops to put down the rebellion, in response to President Lincoln's call, and in 1862 went to the front with the Second Rhode Island Regiment. He was governor from 1860 to 1863, when he resigned to become United States Senator, which office he held until 1875. A. & W. Sprague failed in October, 1873, and the glory departed from the house of Sprague. At the time of their failure, the Spragues were probably the most extensive cotton manufacturers in the world.

At the place now known as River Point, in Warwick,



EDWARD CARRINGTON,

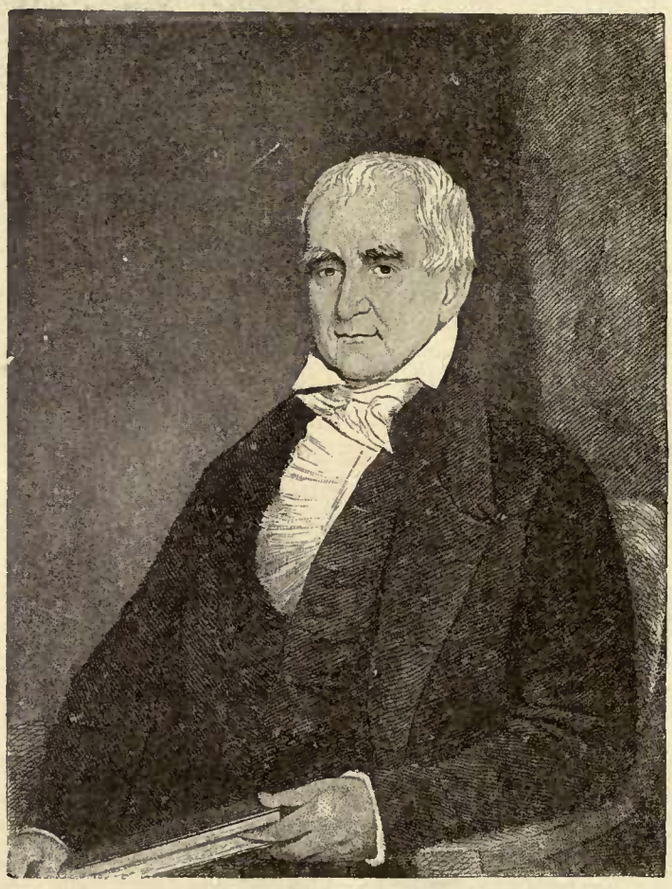
MERCHANT AND PIONEER MANUFACTURER.

near the junction of the two branches of the Pawtuxet River, a mill containing four frames and two mules was built, in 1812, by the Greene Manufacturing Company, composed of Dr. Stephen Harris, Dr. Sylvester Knight, James Greene, Resolved Slack and Resolved Waterman. Five years later, after the mill had been shut down for some time, the business came under the exclusive control of Dr. Harris. Subsequently two other mills were built and manufacturing was carried on here by the Harris family until some time in the '80's, when the entire property was bought by B. B. & R. Knight.

Simon Henry Greene, a grandson of Colonel Christopher Greene, a soldier of the Revolution, began the bleaching business in 1828 in company with Edward Pike, on the north branch of the Pawtuxet, just below Lippitt. The firm subsequently engaged in calico printing. After Mr. Pike's death the interest of his heirs was purchased by Mr. Greene. The concern is now known as the Clyde Print Works and Bleachery and is run by Mr. Greene's sons.

James De Wolf, of Bristol, Dr. Caleb Fiske and his son Philip, began the manufacture of cotton on the north branch of the Pawtuxet in 1809, and named their new settlement Arkwright, in honor of the great English inventor. In 1817 Mr. De Wolf purchased the entire property. Dr. Fiske, with his son, established a factory in 1812 on the next water-privilege above Arkwright, and called the village Fiskeville. Soon after, Charles Jackson, who was governor of the state in 1845–6, bought the water-privilege above Fiskeville, built a factory, and called the village Jackson. About the year 1822, Elisha and John C. Harris built a mill between Arkwright and Phenix. The village in the neighborhood became known as Harrisville. Elisha Harris accumulated a large fortune as a manufacturer. He was governor of the state from 1847 to 1849. The property at present consists of two mills, operated by the Harris Manufacturing Company of which ex-governor Henry Howard is president.

The Coventry Manufacturing Company, composed of James Burrill, Richard Jackson, John K. Pitman, William Valentine, Richard Anthony, William Anthony, Nathan Jackson and Samuel Arnold began the erection of a mill, at what is now the village of Anthony, in the autumn of 1805 and finished it in 1806. Richard and William Anthony, after whom the village was named, were the sons of Daniel Anthony, to whom belongs the credit of making the first attempt, in company with Lewis



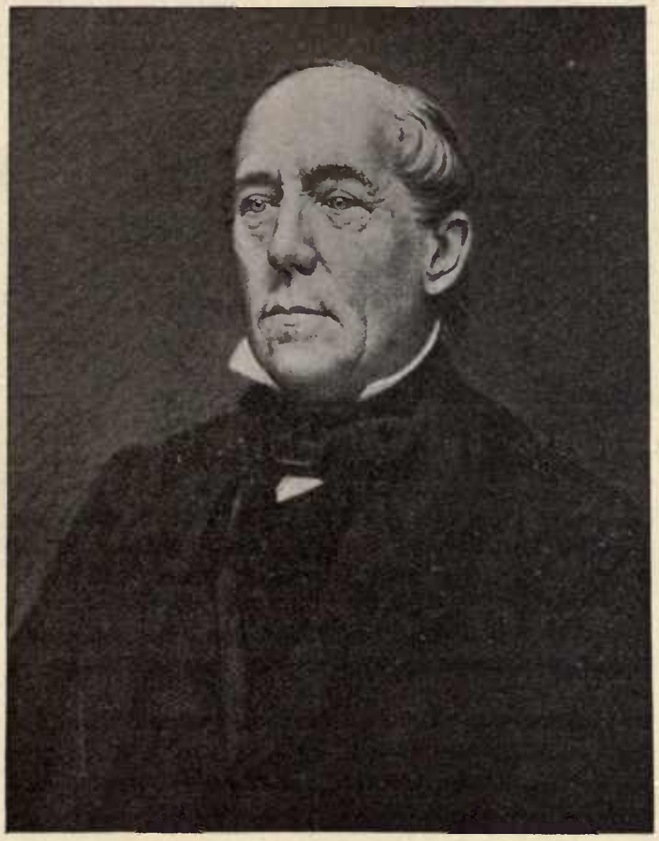
NICHOLAS BROWN,

MERCHANT, MANUFACTURER, PHILANTHROPIST, AND BENEFACTOR OF BROWN UNIVERSITY, IN HONOR OF WHOM THE UNIVERSITY WAS NAMED.

Peck and Andrew Dexter, to introduce the manufacture of cotton by machinery in Rhode Island. The late Senator Henry B. Anthony was a son of William Anthony. Charles Jackson, governor of Rhode Island, 1845–6, and George Jackson, at one time editor of the *Providence Journal*, were sons of Richard Jackson. A second mill was built in 1810. In 1823 the mill at Anthony was one of the largest in the country. The present factory, one of the finest mill structures in the country, was erected in 1874, at which time the old buildings were taken down. In 1862 the company was incorporated under the name it had borne so long. Seven hundred and fifty looms and 36,500 spindles are now operated by water and steam-power.

In 1809 a small cotton mill was erected at Coventry Centre. The factory had 300 spindles in 1823 and then belonged to Lowry Arnold, the great-grandfather of the Honorable Warren O. Arnold, the present representative in Congress from the western Rhode Island district.

The Washington Manufacturing Company built a mill of 15,000 spindles on the south branch of the Pawtuxet in 1812. Among the members of the company were Caleb Kilton, John Bissell and Peleg Wilbur. This mill was burned in 1825, but was immediately replaced by a much larger factory built of stone, which contained about one hundred looms and between four and five thousand spindles.

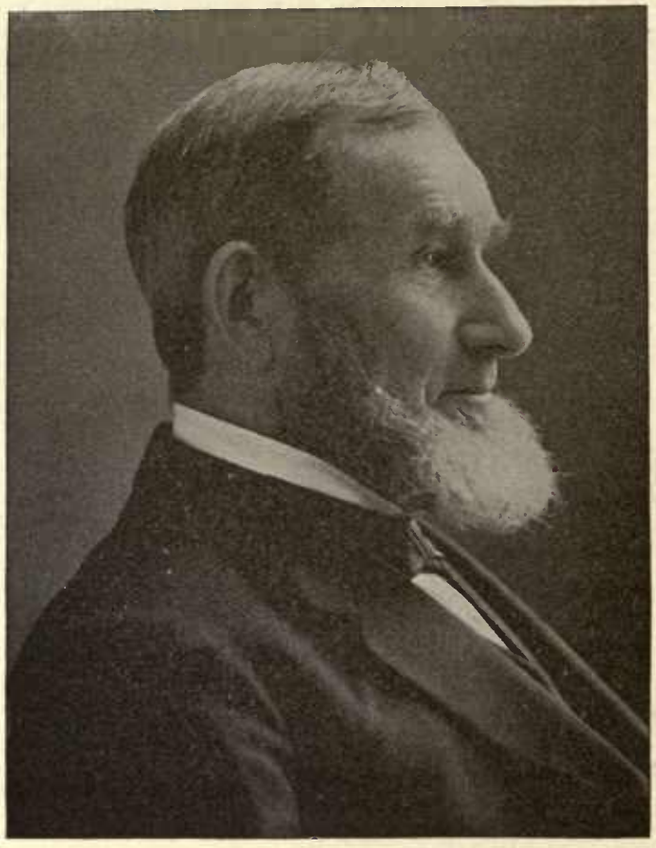


THOMAS FLETCHER,

FIRST PRESIDENT OF THE FLETCHER MANUFACTURING COMPANY.

The cotton manufacture was begun in 1811 at the Social village, Woonsocket, by a company composed of Ariel, Abner and Nathan Ballou, Eber Bartlett, Job and Luke Jenckes, Oliver Leland and Joseph Arnold. The first mill was a small wooden structure, which occupied the present site of the Social Mill. A second mill was built in 1827. In 1841 the property came into possession of Dexter Ballou, who soon after built a stone mill and carried on the manufacture with great success. Mr. Ballou engaged in the cotton manufacture in company with his father before 1817 at what is now Ashton. They soon removed to Woonsocket and there Dexter Ballou was one of the few men who performed a leading part in the development of the place. In 1854 an interest in both the Social and Harrison Mills was sold to H. and R. Lippitt, and the Social Manufacturing Company was incorporated in 1855. The first mill erected on the Smithfield side of the river at Woonsocket was put up in 1827 by the Globe Manufacturing Company, consisting of Thomas Arnold, Thomas A. Paine and Marvel Shove. This property came into the sole possession in 1864 of Mr. George C. Ballou, a brother of Dexter, but is now operated by the Social Manufacturing Company. Such was the excellence of the water-power afforded by the falls at Woonsocket that many manufacturers, both of cotton and wool, were attracted to the place, and in 1830 there were 50,000 spindles in operation. The men who were chiefly instrumental in carrying on this development were the Ballous in cotton and Edward Harris and Welcome Farnum in woolen manufacture. At the present time Woonsocket is the chief manufacturing centre in the Blackstone Valley north of Pawtucket, which place it exceeds in some respects, and in others rivals, in the extent and variety of its industries.

On the Woonasquatucket River, about eight miles from Providence, a mill was built by the Georgia Cotton Manufacturing Company in 1813, and the settlement then and there formed was named Georgiaville. The company was composed of Samuel G. Arnold, Samuel Nightingale and Thomas Thompson. In 1831 there were in operation here 3,700 spindles and 104 looms, and Israel Saunders was the resident agent. Half a mile below Georgiaville, Philip Allen started a mill in 1812, and named the village Allenville. Mr. Allen was governor of Rhode Island from 1851 to 1853, and represented the state in the United States Senate from 1853 to 1859. He established the well-known Allen Print Works at the north end of Providence. His brother, Crawford Allen also started a similar establishment at Pawtucket. The father of these brothers, Zachariah Allen, was one of the first in New England to engage in calico printing. He employed Herman Vandeusen, a native of Mulhausen, Germany, who began the business at East Greenwich about the year 1790. The printing was done by means of wooden blocks, and the cloth was at first imported from India. In 1836 the chief calico printing establishments in Rhode Island were those belonging to Philip Allen in Providence, Crawford Allen in Pawtucket, and that of



THOS. J. HILL.

FORMERLY PARTNER OF SAMUEL SLATER, FOUNDER OF THE PROVIDENCE MACHINE COMPANY, AND PROPRIETOR OF THE ELIZABETH MILLS.

William Sprague at Cranston, all of which did an excellent business.

Zachariah Allen, a younger brother of Philip, founded the village of Allendale, two or three miles below Allenville, and there began the manufacture of cotton in 1822, afterward converting his establishment into a woolen mill, but in 1837 again reverted back to cotton manufacturing. He purchased the Georgiaville mills in 1853, and improved the property to a considerable extent by building a large new mill and constructing a mammoth dam. While he achieved success as a manufacturer by his energy and intelligence, Zachariah Allen is entitled to great honor as the originator of a number of new ideas and methods which have aided very materially in bringing about the great industrial developments of the last fifty years. Without doubt he was the greatest inventor in this sense that Rhode Island has produced. He invented and was the first to practically apply the automatic cut-off to steam engines, and this improvement in the opinion of experts was one of the most important ever made in connection with this great invention. When he started his cotton factory at Allendale he formed a corporation to build reservoirs to so retain the surplus water of the river that it might be used during the drouth of summer to operate his own and other factories along the stream. This company was incorporated in 1824, as the Woonasquatucket River Company, and among the members were the Allen brothers and the owners of the Georgiaville estate. Reservoirs were built in 1823, 1827, 1836 and 1838, covering a total area of nearly six hundred acres, and they were formed by damming up the headwaters of the river in low marshy localities. In 1834 Mr. Allen originated the system of mutual fire insurance for mill property, and the following year put his ideas into practice by establishing the Manufacturers' Mutual Fire Insurance Company of Providence. This was the first company of the kind in the world, and has been the model on which all the factory mutual insurance companies have been formed. It has been estimated that by this coöperative system textile manufactories, paper mills, machine shops, metal works, cordage factories and other similar industries at present save not less than two million dollars a year in the cost of their insurance. As one writer on this subject says: "It has rarely fallen to the lot of any single man to confer so great a benefit in so thoroughly simple and scientific a manner as has happened in this case; and to Mr. Allen is due the greater share in this benefit." He introduced a better method of transmitting power from the motor to the machines—by belting and bands instead of by gearing. Beside all this notable work Mr. Allen wrote a number of books. In the first, published in 1829, and entitled "*The Science of Mechanics as applied to the Useful Arts in Europe and in the United States of America*," he laid down the principles of mechanics as applied to manufacturing and made many suggestions that proved of great practical benefit. Among his other publications were: *European Travels; Historical Sketch of the Improvements in Transmission of Power from Motors to Machines*; and *Solar Light and Heat, the Source and Supply*. He was also the author of many miscellaneous articles and addresses, particularly on Rhode Island and local subjects, but his chief claims to fame rest on his mechanical writings and on the improvements in methods he suggested and introduced. Mr. Allen was born in Providence, September 15, 1795. He graduated at Brown University, and after studying both medicine and law he practiced as a lawyer before engaging in business as a manufacturer. He died March 17, 1882, in his eighty-seventh year. He was a genial, loving, kindly man, and was possessed of a wonderful amount of public spirit, as his efforts in many lines for the advancement of the community, in the introduction of water into Providence, the establishing of the free library and numerous other enterprises, all testify.

Thomas Fletcher, an English cotton weaver, came to this country in 1791, and two years later established himself in Boston, in the business of weaving lamp wicks, tapes, webbing and fringes. In 1808 he removed to Providence on account of the advantage of securing the cotton yarn he needed from the new spinning mills that had been erected. The business at first was carried on in a very small way, but it increased continuously, and the three sons, Thomas, William and Joseph learned their father's trade. At his death in 1824, the two older

brothers formed a partnership and in 1837, the youngest, Joseph, was admitted, and the firm then became Fletcher Brothers. At the lowest water-privilege on the Moshassuck River, where in the early days of the history of Providence, the "town grist mill" had stood, they located their boot, shoe and corset lace and lamp wick factory in 1840, and there the business has developed to immense proportions, since 1865 under the name of the Fletcher Manufacturing Company. The first president of the company was Thomas Fletcher, the eldest son of the founder of the business.

A familiar figure on the streets of the city of Providence is the veteran manufacturer and machinery builder, Mr. Thomas J. Hill, whose business life connects the time of Slater with the present in a direct manner. Mr. Hill was born in Pawtucket in 1805, and when eight years of age went to work in one of the cotton mills, and continued to work in the old White Mill, and in other factories in his native village until 1822. In that year he began to learn the trade of a machinist in the shop of Pitcher & Gay, cotton machinery builders. On the completion of his trade in 1830 Mr. Hill came to Providence, and became foreman of the machine shop of the Steam Mill, which had come into the exclusive possession of Samuel Slater the year before. In 1834 Mr. Hill entered into a partnership with Mr. Slater under the name of the Providence Machine Company, the object being the construction of cotton machinery. At first the manufacture was carried on in two rooms in the Steam Mill. The business increased rapidly under Mr. Hill's management, and in 1845 the present extensive works of the company on Eddy Street were erected. The interest of Mr. Slater's heirs was bought out by Mr. Hill in 1844. In 1869 a charter was secured, and in 1874 a corporation was formed, the old name Providence Machine Company being retained. Mr. Hill is still president of the company. Although the construction of cotton machinery at this establishment has always been Mr. Hill's chief business in life, he has been very largely interested in many other manufacturing enterprises. The principal one of these undertakings was the founding in 1867 of the village of Hill's Grove, seven miles from the city of Providence. Here the Rhode Island Malleable Iron Works was established during that year. In 1875 he built a cotton mill of 20,000 spindles in the village, and named it in honor of his wife the Elizabeth Mill. Mr. Hill was a member of the Providence city council in 1848, 1852, 1855, 1856, and 1878.

At what is now the village of Pontiac, the water-privilege nearest the mouth of the Pawtuxet River, the inhabitants of the town of Warwick, previous to the erection of mill-dams, were accustomed to trap the fish that migrated from the ocean to the inland ponds to deposit their spawn. Here "weirs" were constructed and the place became known locally as "the great weir." The water-power was first made use of to run a saw and grist mill, by Henry and Dutee Arnold about 1810. Shortly afterward Henry Arnold erected a small mill, and carried on wool carding and cotton spinning. This mill was bought by Rice A. Brown, Jonathan Knowles and Samuel Fenner in 1827, and they operated it two years. Its capacity was about one thousand spindles. The firm failed in 1829, and in 1830 the property was bought by John H. Clark. He changed the name of the village from Arnold's Bridge to Clarksville. Mr. Clark was a lineal descendant of Dr. John Clark, the friend and associate of Roger Williams, and on his mother's side was descended from Esek Hopkins, the first commodore of the American navy. He had been agent of the Steam Mill in Providence up to the time of Slater's embarrassment. In 1834 he bought the remainder of the water-privilege and erected a stone mill, and in 1834 started a bleachery. Mr. Clark was elected to the United States Senate in 1846, and being thus taken away from his business he leased his mills and bleachery for $5,000 a year to Zachariah Parker, who had been the superintendent, and to Robert Knight, who had been a clerk in the store. They conducted the enterprise under the style of Parker & Knight. The whole property was purchased from Mr. Clark by Parker & Knight in 1850, and the following year Mr. Knight bought his partner's interest. In 1852

EX-SENATOR JONATHAN CHACE,

MANUFACTURER.

Mr. Knight sold one half of the property and business to his brother Benjamin B., and the firm of B. B. & R. Knight was formed. At the same time the village was renamed Pontiac.

The development and success of the business of B. B. & R. Knight have been phenomenal. At present they are probably the most extensive manufacturers of cotton goods in the United States, and are the owners of more than a score of mills, scattered over this and adjoining states. In 1853 they purchased the mill property at Hebronville, Mass., and the following year that at Dodgeville. At the latter place the cotton manufacture had been started in 1809 by Eben Tyler of Pawtucket, Nehemiah Dodge, Peter Grinnell and son, and Abner Daggett of Providence, Elias Ingraham and Edward Richardson of Attleboro, under the name of the Attleboro Manufacturing Company. This enterprise under various changes in ownership had been uniformly successful up to the time of purchase by the Messrs. Knight. The Grant Mill on Carpenter Street, Providence, was purchased by them in 1871, the mill at Manchaug, Mass., in 1872, the White Rock Mill, Westerly, in 1874, the Clinton Mill, Woonsocket, in 1876, the property at Fiskeville, on the Pawtuxet River, in 1877. After the failure of the Spragues their mills at Natick and Arctic were purchased by B. B. & R. Knight, and the mill at River Point also came into their possession a few years later. All this property has been continuously improved and developed, new buildings erected, and the latest descriptions of machinery introduced. From the original home of the business at Pontiac up to Arctic, on the south branch of the river — a continuous track of country six or eight miles in extent in the valley of the Pawtuxet — the villages and mills belong to this firm.

For a longer period than any other business house in Rhode Island the firm of Brown & Ives has existed and occupied a leading position. The foundation of this historic house was laid about the middle of the last century by James and Obadiah Brown, great-grandsons of Rev. Chad Brown, one of the early settlers of Providence. The four sons of James Brown formed the commercial firm of Nicholas Brown & Company about the middle of the last century. By the withdrawal of the other three brothers, the business was ultimately left in possession of Nicholas. He died May, 1791, leaving a son and daughter, Nicholas and Hope, aged 22 and 18 respectively. Nicholas became a member of the firm on attaining his majority. Thomas P. Ives, who had been in the employ of the house, married Hope Brown in March, 1792, and the same month entered the firm, which then assumed the style of Brown & Ives. This name has been retained until the present by the descendents of the original partners who now carry on the business. Nicholas Brown was the chief benefactor of Brown University, his gifts amounting to a total of over $160,000. The name of the institution was in 1804 changed from Rhode Island College to Brown University in his honor. He was born in Providence April 4, 1769, and died September 27, 1841. Besides his gifts to the University, he left large sums to the Providence Athenæum and the Butler Hospital. The business of Brown & Ives continued to be chiefly commercial until about 1830, but as early as 1804 a controlling interest in a cotton mill erected that year in Blackstone, Mass., was acquired. In 1827, in connection with Wilbur Kelly and General Edward Carrington, a cotton mill was started at Lonsdale, which became the nucleus from which the Lonsdale Company and the other extensive enterprises of Brown & Ives in the Blackstone Valley developed. A large mill at Ashton was erected in 1867, and one at Berkeley in 1872. The latest addition to the property is the Ann and Hope Mill at Lonsdale, erected on the reputed site of William Blackstone's residence, "Study Hill." The firm also owns mills at Phenix and at Hope in the Pawtuxet Valley.

The small factory of 1,600 spindles, erected in 1812, on the French River, a tributary of the Quinebaug, in the town of Thompson, Conn., by John Mason, General Jas. B. Mason and others, was the nucleus of the large property built up by the late Dr. Wm. Grosvenor, and of which a brief account is given in the latter part of this work. The business of the Grosvenor Dale Company is one of the most important and extensive, of its kind, in this country.

Governor Elisha Dyer, with his father, Elisha Dyer, began the manufacture of cotton cloth in North Providence, in 1835, starting the Dyerville mill, of which Governor Dyer was agent until the death of his father, in 1854, when he became sole owner of the property and continued to run the plant until 1867, when, on account of ill health, he sold it to other parties. The mill is still run by the Dyerville Company, of which Truman Beckwith is treasurer. The senior Elisha Dyer was a native of Glocester, and previous to engaging in the manufacture of cotton carried on a commission business. When a boy of 10 years he was apprenticed to John Fitton, a Scotchman, who was so much attached to him that on his death he bequeathed his business and a large share of his property to Mr. Dyer, who formed a partnership with a former clerk, and continued the commission business until 1835, when the Dyerville mill began operations. Governor Dyer died in 1890. He was governor of Rhode Island in 1857-58.

The Patent Calender Company, of Providence, the predecessor of the Providence Dyeing, Bleaching and Calendering Works, was started in 1814, the originators being men who became more or less prominent in the industry of the state in later years. The original incorporators, who carried on a general business in bleaching and dyeing cotton, were John B. Mason, Benjamin Dyer, Charles Dyer, Elisha Dyer, Benjamin Hoppin, T. C. Hoppin, Henry Hoppin, Smith Bosworth, Olney Dyer and Hercules Whitney. Benjamin Hoppin was an uncle of William Warner Hoppin, who later held a controlling interest in this corporation, and was governor of Rhode Island in 1854-5-6.

The firm of A. D. & J. Y. Smith was formed in 1843, but prior to this time each of its members had been interested in the cotton industry In 1828, A. D. Smith hired what was known as the Button-mold privilege, in Johnston, and started a cotton mill in connection with Charles H. Franklin. The mill was run with a few hundred spindles only. Later he became interested in

the Union mill, and the Merino mill, and in 1850 a consolidation of these three mills was effected. James Y. Smith became interested in the cotton manufacture in 1837. His father-in-law, Thomas Brown, had been interested in the Scituate Manufacturing Company from its organization in 1826 in North Scituate, and Mr. Smith invested money in this company on his own account. Later, also, he obtained an interest in the Ashland Company, in North Scituate, and on the organization of the firm of A. D. & J. Y. Smith the business in this line of manufacture largely increased, one of the important purchases of the firm being the Providence Steam Mill, then owned by Samuel Slater & Company. James Y. Smith was governor of the state in 1863-4-5, during the most critical time of the War of the Rebellion — elected in the latter year by a majority of every town and ward in the state.

DR. WILLIAM GROSVENOR,

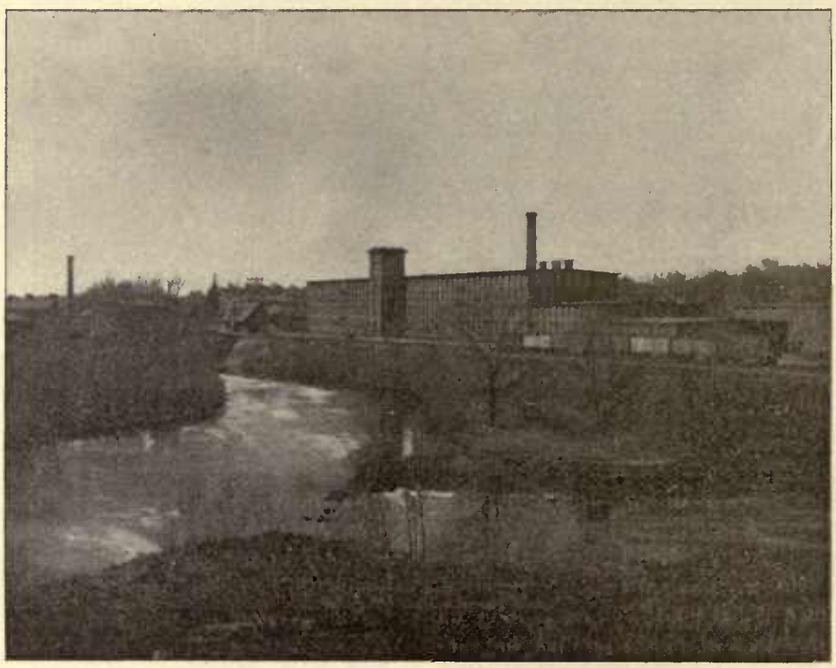
BY WHOM GROSVENDR DALE WAS BUILT UP AND DEVELOPED.

Two cotton mills were started at Fall River in the year 1813, the managers and conductors of both enterprises being young men who had obtained a knowledge of the manufacture in Slater's mills at Pawtucket. At that time the place was a small village of about three hundred inhabitants, and was known by the name of Troy. The excellent water-power afforded by the Quequechan River in its rapid descent down the steep hill-side from the Watuppa ponds to the sea, was the inducement that led to the establishing of these factories. David Anthony, a young man 27 years of age, who had worked as a clerk in the White Mill, Pawtucket, and had afterward operated a small factory in Rehoboth, formed the Fall River Manufacturing Company, in March, 1813. His principal associates were Dexter Wheeler and Abraham Bowen, and the capital stock of $40,000 was subscribed by people in the adjoining towns. The erection of a mill was immediately begun at the head of the third fall from tide-water. The structure was 60 x 40 feet in dimensions, three stories high, and intended for 1,500 spindles. It was finished and began operation in October of the same year. David Anthony continued as active manager of this concern until 1836, and during that time and afterward, until his death, at the age of 83, July 6, 1867, he was prominently identified with the organization of new corporations, and was one of the few men whose labors developed Fall River. The other enterprise was started by Oliver Chace, and was known as the Troy Manufacturing Company. The capital stock was $50,000, divided among twenty-seven persons residing in the neighboring towns of Tiverton, Newport, Warren, Rehoboth, Swansea and Somerset. Mr. Chace's principal associates were Nathaniel Wheeler and Eber Slade. The mill erected by this corporation was much larger than that of the Fall River Manufacturing Company, being 108 feet long by 37 wide, and four stories in height, and it was situated at the outlet of the ponds. Although it was finished in September, 1813, the machinery was not started until March, 1814. Oliver Chace continued as superintendent of the Troy Company until 1822, when he became agent for the Pocasset Company, and his son, Harvey, succeeded him at the Troy mills. In 1839 Oliver Chace purchased the estate on the Cumberland side of the river at Valley Falls, R. I., and established his sons Harvey and Samuel B. in business there as cotton manufacturers. Ex-Senator Jonathan Chace and his brother, James H., who operate the mills at Albion, R. I., are the sons of Harvey, while Arnold B. Chace, the treasurer of the Valley Falls Company, is the son of Samuel B. Other men who were especially conspicuous in the development of Fall River were Major Bradford Durfee, Richard Borden, Andrew Robeson and William C. Davol. Through the exertions of themselves and their associates the city has

gradually grown to its leading position. At present the number of corporations engaged in the cotton manufacture is forty, owning sixty-five mills, containing 2,128,228 spindles, and 49,586 looms, and employing 21,750 persons. The massive factories, each several hundred feet in length and five and six stories in height, the majority of them built of granite, loom up in every section of the city and suburbs.

Manchester, N. H., owes its origin and development to the Amoskeag Manufacturing Company. In the year 1809 a small mill for the manufacture of both cotton and woolen goods was started at Amoskeag Falls, on the Merrimack River, by Benjamin Pritchard and three brothers named Stevens. The following year the property passed into the hands of the Amoskeag Cotton and Woolen Manufacturing Company, and the mill was carried on under this name until 1822, when Olney Robinson purchased it. The place was at first known as Goffstown, and afterwards as Amoskeag Village. Samuel Slater purchased the mill and water-privilege in 1822, and associating with himself Larned Pitcher, Willard Sayles, Lyman Tiffany, Dr. Oliver Dean and Ira Gay, he formed a manufacturing company. Dr. Dean became the resident agent, the Old Mill was enlarged, two others built, and the business was rapidly developed. In 1831 the company secured a charter of incorporation from the New Hampshire legislature, under the name of the Amoskeag Manufacturing Company, with an authorized capital of $1,000,000. Nearly all the land and water rights on both sides of the river were then bought up by the new corporation until it was possessed of 26,000 acres, including all the mill sites and water-powers from Concord to Manchester, as the rapidly developing community was then called. Since then this corporation has not only carried on the cotton manufacture, but has also engaged in selling land, letting water-power and constructing locomotives, fire engines, turbine wheels and heavy tools. At present, however, all this portion of the business has been disposed of, and the company confines its attention to the cotton manufacture. The development of the water-power entered upon by the Amoskeag Company soon induced other manufacturers to locate here, and as land and water rights were sold on easy terms, the place rapidly became a great manufacturing centre. The name Manchester was given to the place because the hope was formed that it would stand in the same relation to the cotton manufacture in this country as its namesake did in England. Although this result has not been realized, it is one of the chief centres of the industry in the country, and ranks next to Lowell. Nearly nine millions of dollars capital are invested, 468,600 spindles and 15,657 looms are operated, and about twelve thousand persons are employed in the factories.

Samuel Batchelder became connected with the spinning of cotton yarn in 1807, in New Ipswich, N. H., where he established the second cotton mill in that place, which was regarded with jealousy by the proprietors of the first one, from a fear that the business would be overdone. The product was woven into shirtings, checks and twilled goods by the women in the vicinity, who came for miles to obtain the yarn which was taken home to be woven by hand. During the war of 1812, proposing to consign some of his goods to Boston merchants, he was informed that it would be discreditable to them to sell American goods. He was obliged to send them to the retail stores in Salem and other towns, but after the war, when commission houses had been established in Boston, Mr. Batchelder's goods were sold in that city. In 1824, Mr. Batchelder became interested in the establishment of a factory in what is now Lowell. The following year he was instrumental in starting the Hamilton mills, and adapted the power-loom to the weaving of twills, something that had not been attempted, even in England. The goods were sold so readily, and at such a price, that the Suffolk Company was formed and two large mills erected for the purpose of the manufacture. Mr. Batchelder also began here the making of Canton flannel. Remaining here six years, he made arrangements to rebuild on the Saco River, in Maine, some old mills that had been burned, and in 1831, he was instrumental in forming the York Manufacturing Company in Saco. Here he invented the stop-motion for the drawing frame, and made other improvements therein. He was interested in this company, with an interval of ten years retire-



THE ANN AND HOPE MILL, LONSDALE.

OCCUPIES THE SUPPOSED SITE OF WILLIAM BLACKSTONE'S RESIDENCE.

ment from the treasurership, until 1869, when he was 85 years old. He died at the advanced age of 94 years.

In 1821 Isaac Wendell, of Dover, N. H., purchased land and privileges on both sides of the Salmon Falls River in that state, and had commenced building in Somersworth, now Great Falls, when the Great Falls Manufacturing Company was formed in 1823. This company engaged Mr. Wendell's services, and this was the beginning of the cotton industry in Great Falls. The company gives employment to nearly two thousand people to-day. In 1827 the Cocheco Manufacturing Company was established at Dover. In 1822-23 the lands around the falls at Nashua were purchased, and in June, 1823, the Nashua Manufacturing Company was chartered.

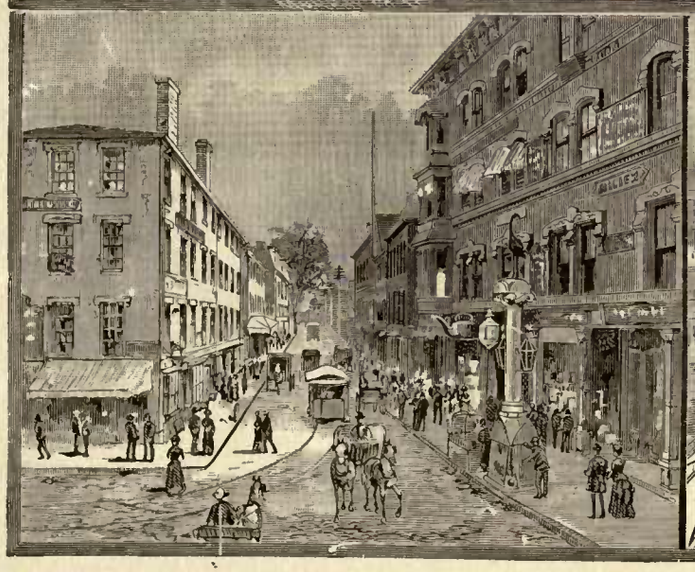
The cotton manufacturing city of Lawrence, on the Merrimack River, ten miles below Lowell, had its beginning in 1845, when the Essex Company, of which the Honorable Abbott Lawrence, of Boston, was president, and P. T. Jackson, William Sturgis, Nathan Appleton and John A. Lowell directors, built a dam across the Merrimack at a cost of $250,000, and also constructed a canal over a mile in length. This work was entered upon for the purpose of affording a water-power for the operation of cotton factories. The first mills were built in 1846, and during the next few years many mills were erected between the canal and the river, where they could best utilize the water-power. The place was named in honor of the Honorable Abbott Lawrence, the president of the Essex Company, and a well-known citizen of Boston. One of the greatest calamities in the annals of the cotton manufacture occurred here in January, 1860, when the Pemberton mill collapsed during working hours, burying in the ruins several hundred operatives, many of whom lost their lives by being crushed, while others were burned in the fire that started among the wreckage, before they could be extricated. At the present time, Lawrence is in the first rank as a cotton manufacturing centre. The capital invested is between eight and nine millions of dollars, while 415,448 spindles and 12,445 looms are operated, and 12,720 operatives employed.

It would be an almost endless undertaking to enter into details about the men who were conspicuous in establishing the great centres of the industry that had their origin in the years succeeding those mentioned in the preceding pages. The ever widening scope of the industry has constantly tended to make individuals less conspicuous. In the early days many men were noticeable because of their sallies into new fields of effort, or on account of the magnitude of their enterprises as compared with the general extent of the manufacture, but at present such opportunities are lacking and there are so many extensive establishments that few are specially prominent.

The men who established the first factories were not the only pioneers in the cotton manufacture. So recently has the business been developed that many of the advances in machinery and methods were made by men still living, and the founders of some of the great establishments in various parts of the country are yet engaged in active life. Many others who never acquired wealth or became prominent and successful as manufacturers, contributed very largely to the development of the industry. The improvements which have brought the cotton machines to the condition of great perfection they possess to-day, resulted chiefly from the observation and experiments of a multitude of men who were directly employed either in building or operating the machinery. These mechanics and operatives were quick to see that a slight change in one part, a simplification in another, or a small addition to the mechanism, would make the machines more effective. In the majority of cases these improvements though valuable were relatively of little importance, although, as a whole, the result has been the evolution of almost perfect mechanical automatons in the shape of cotton machinery. The records of the patent office would afford a clue to these inventors, but probably the testimony thus secured would not be absolutely accurate, for, as in the case of the great inventions, the individual who takes out the patent is not always and necessarily the person who had conceived the idea. Many of these improvements, too, were without doubt applied without being patented. A curious fact, which is true not only of these, but of all inventions, is that many men seemed to conceive similar ideas simultaneously, so that the same improvements are often found to have been made in places widely separated, without there having been any consultation or collusion between the originators. These minor inventions, at least, and without doubt many of the greater ones owe their origin more to the race than they do to individuals, being the outcome of the general influences that the community exerts or which seem to exist in the atmosphere where men congregate. While improvements will continue to be made in cotton machinery in the same manner as those already accomplished, it is not improbable that new principles may be discovered which will entirely revolutionize present methods.

HENRY LIPPITT,

MANUFACTURER, TREASURER OF THE SOCIAL MANUFACTURING COMPANY, GOVERNOR OF RHODE ISLAND 1875-1877.



VIEWS OF PAWTUCKET AND CENTRAL FALLS.

NORTH MAIN STREET, PAWTUCKET.

PAWTUCKET FROM THE BELFRY OF THE CONGREGATIONAL CHURCH, BROADWAY.

ALONG THE RIVER FRONT, CENTRAL FALLS.

Chapter IV.

PAWTUCKET, ITS ORIGIN AND PROGRESS.

Joseph Jenks the First Settler—Abandonment of the Settlement During King Philip's War—Governor Jenks and the Other Sons of Joseph Jenks—The Falls—Building of Mill Dams—Sergeant's Trench—Origin of the Name Pawtucket—The Blackstone River—The Two Pawtuckets and the Various Changes in Local Government and Jurisdiction—Early Settlers on the Rehoboth Side—Oziel Wilkinson and His Family—David Wilkinson—Timothy Greene—Sylvanus Brown—Stephen Jenks and Other Pioneer Mechanics—Appearance of the Villages at Different Dates—The Old Slater Mill and Other Factories—Slater Mansion—Water Rights, Water Powers and Water Works—First School and Church—First Banks—First Fire Company—The Influence of the Past Upon the Present and Future.

Pawtucket's chief claim to distinction in a historical sense is that it was the birthplace of the cotton manufacture in America. But this is no slight honor, as that event marked a new era, which in its social and industrial aspects has scarcely a parallel. Pawtucket's fame, however, does not rest wholly on this far reaching occurrence, for from its earliest beginning it was a workshop for a large section of the surrounding country, and was also the home of many ingenious mechanics.

Twenty years after Roger Williams settled at Providence Joseph Jenks, attracted to the locality by the excellent water-power and by the abundance of fine timber in the virgin forests on both banks of the stream, settled at Pawtucket Falls. He was a worker in brass and iron, having learned the business with his father, also named Joseph, who is supposed to have come to America with Governor Winthrop. This original Joseph Jenks is credited with being "the first founder who worked in brass and iron on the Western Continent; by his hands the first models were made, and the first castings taken of many domestic implements and iron tools." That he was a mechanic of unusual skill is evident from the fact that he obtained a patent from the General Court of Massachusetts in 1646 for a water wheel, "mills for y^e^ making of sithes and other edged tools," and for a saw mill. In 1655 he obtained another patent for an improved scythe, the blade being made much longer and thinner than formerly, and having a bar of iron welded on the back to strengthen it.

THE FALLS EARLY IN THE CENTURY.

(From an original in the possession of General Olney Arnold.)

The younger Jenks, the settler of Pawtucket, was born in Buckinghamshire, England, in 1636, and came to America in 1645, some years after his father's arrival. For ten years he labored with his father at Lynn, and then, no doubt thoroughly equipped as a master in his craft, he started out for himself. According to a well authenticated tradition it was in the year 1655 he built a forge in a deep ravine a short distance below Pawtucket Falls, on the west side, and began to make common iron utensils and tools, finding a market in Providence and the surrounding settlements. As the working of iron is one of the most necessary and fundamental occupations, this forge quickly became the nucleus of an industrial settlement. New settlers were attracted, clearings were made and houses built, and soon a little village had grown up. During King Philip's War, 1675–6, the little settlement was broken up and the forge and most of the dwellings were burned by the Indians, but after the death of Philip the settlers returned, the forge was rebuilt, new houses erected or the ruined ones made habitable, and the industrial life of the little community moved on as before.

Joseph Jenks attained some political distinction in the colony, as in old documents he is given the title of "assistant," which corresponds to senator or lieutenant-governor. He had four sons, and the family attained an important position in the colony. The eldest son, also named Joseph, was deputy governor for eleven years, from 1715 to 1721, and from 1722 to 1727, and governor

from 1727 to 1732. He was a man of great stature, almost a giant in size, but evidently his mind corresponded to his body, as not only did he take a prominent position in public affairs outside of his duties as governor and deputy governor, but he doubtless developed the water-privilege at the falls and greatly increased the business begun by his father. The three other sons were, Nathaniel, Ebenezer and William. The first is given the title of major and probably was an officer in the colonial militia; Ebenezer became a preacher, and William a judge. Governor Jenks died June 15, 1740, in his 84th year.

Ezekiel Holliman, one of Roger Williams associates, is thought to have been the first white possessor of the land on the west side of the river at Pawtucket Falls, and from him or his heirs it is likely Joseph Jenks made his first purchase. In 1671 he purchased another tract from Abel Potter, who had acquired it through his wife, a granddaughter of Ezekiel Holliman. Ultimately most of the land on the west bank came into possession of the Jenks family.

The falls originally were very irregular in appearance, consisting of a number of shelving, detached and projecting ledges, and while they furnished an excellent water-power, as the industries in the neighborhood increased the building of dams was found necessary. In 1718 the lower dam was built. This was made by uniting some of the upper ledges forming the falls. Previous to this period there was an old dam on the western side, extending three-fourths of the way across, and there was also a partial dam for a saw mill on the east side. The lower dam was a substitute for both these earlier ones. Manufacturing, however, was regarded of so little account in those days that the farmers who resided further up the stream considered the falls only in the light of an obstruction which prevented the fish — shad and alewives — from coming up to spawn. About the year 1714, a canal was dug, on the western side of the river, beginning above the falls, running around them, and emptying into the river ten rods below. This channel, known as Sergeant's trench, followed the lines of an old gutter through which a portion of the water flowed during freshets, and was designed as a passage way for fish; but it failed of its purpose, and after 1730 was utilized for manufacturing. The desire to overcome the obstacles the falls presented was not destroyed by this failure, as in 1761 the General Assembly authorized a lottery to raise £1,500 to pay the cost of making a passage around the falls, "so that fish of almost every kind who choose fresh water at certain seasons of the year may pass with ease." A dozen years afterward another act was passed empowering any one to break down or blow up the rocks at the falls, the same end being sought as in the other instances. These laws failed utterly to bring about the desired result. Another dam was built in 1792, twenty rods above the lower dam, and just above the head of Sergeant's trench. This was known as the upper dam, and was probably constructed to furnish a suitable supply of water for the Old Slater Mill.

The falls gave the name to the settlements that grew up in the neighborhood on both banks of the river, although the west side was Rhode Island territory and the east side was in Massachusetts. The word Pawtucket is of Indian origin, and has been said to mean "falls of water." For a long time the river was known by this name, then it was only applied to that portion below the falls, but at present it has even been supplanted there, the name Seekonk being now generally used to indicate the lower reaches of the river. In its whole course above Pawtucket the river bears the name of Blackstone, in memory of the first settler of Boston, the Rev. William Blackstone, the story of whose life and movements in the dawn of colonial life is enveloped with so much romance and mystery.

The Rhode Island side of the river was always the most important and populous. Here the Jenkses carried on their business, and the forges, grist and saw mills were chiefly located at the west side of the falls. Originally this section was within the territorial bounds of Providence. North Providence was set off as a separate town in 1765, and the village of Pawtucket was the most important place in its limits, which position it continued to hold until consolidated with the other side of the river as a Rhode Island town, May 1, 1874. The Massachusetts Pawtucket was in the limits of the old town of Rehoboth until 1812, when the territory was divided and the western part, including Pawtucket, was formed into the town of Seekonk. In the spring of 1828 Seekonk was divided, and the village on the east side, which then had only between four or five hundred inhabitants, was constituted a Massachusetts town, by the name of Pawtucket. The first town meeting was held in the Baptist church on School Street, March 17, 1828. On March 1, 1862, by the settlement of the boundary question, the town of Pawtucket was ceded to Rhode Island in exchange for the town of Fall River, which was given to Massachusetts. Three years later its population was about 5,000, but the village on the other side of the river was then twice as large. The two places were formed into one town May 1, 1874, and the population of the united community in 1875 was 18,464. North Providence's population in 1870 was 20,495, but in 1875, after Pawtucket had been separated from it, there were only 1,303 left. After some years of agitation, Pawtucket was incorporated as a city by an act passed March 27, 1885, which was accepted by the citizens April 1st of the same year by a vote of 1,450 in favor to 721 against. The new city government was organized January 4, 1886.

Who the earliest settlers at the falls on the Rehoboth side were is uncertain. Rehoboth was settled by Rev. Samuel Newman, who with a company of his congregation removed from Dorchester to Seekonk, about four miles to the south of the falls. It is supposed that some of the members of this community first located near the falls, and the names of Bucklin, Read and Smith are found on the early records as possessors of the land. In the beginning of the last century there were very few residents. By 1750 a small hamlet had grown up, and there was a potash factory, a linseed oil mill, and boats and rigged vessels were built at the landing.

Up to the time of the Revolution the village of Paw-

tucket was a very small place. The whole town of North Providence in 1774 only contained 830 inhabitants, and of this number probably not more than 500 were at the falls. The farming towns in the state had a much larger population and were relatively of much greater importance. A new era however dawned with the return of peace. Oziel Wilkinson, with his family, consisting of five sons and four daughters, moved from Smithfield to Pawtucket about the year 1783, being induced to take this step by the ample water-power and convenient nearness of the mills and forges at the falls. He and his older sons were blacksmiths, excellent mechanics, and some of them gifted with the inventive faculty in rare degree. Through their exertions the village of Pawtucket became the principal centre of the iron and machinery manufacture in this part of the country during the last quarter of the eighteenth century, and the first quarter of the present century. Mr. Wilkinson was born in Smithfield, January 30, 1744. so that he was about 40 years old when he removed to Pawtucket. He started an anchor mill in 1784-5, made cut nails, farming tools and domestic utensils. He was a very alert, industrious, and shrewd man, and in addition to his iron business, engaged in various other enterprises. With his son-in-law, Samuel Slater, and others, he embarked in the cotton manufacture soon after the Old Mill was an assured success. He built thirteen miles of the road between Pawtucket and Boston in 1804, and in after years this turnpike afforded him easy access to Boston, where he carried his nails to market. The building now occupied by the American Hair Cloth Padding Company stands on the site of Oziel Wilkinson's anchor shop, and is built across Sergeant's trench. Oziel Wilkinson died in 1815.

PAWTUCKET, WEST SIDE, IN 1830.

(From the old print.)

Samuel Slater arrived at Pawtucket at an opportune time. The village had been developed and invigorated, by the incoming of the Wilkinsons. Slater's marriage to Hannah Wilkinson brought about a union of interests that resulted to the mutual benefit of himself, and his father-in-law's family, and these relationships had a great influence in aiding in the development of Pawtucket and the extension of the cotton industry. The Wilkinson brothers formed two co-partnerships, Abraham and Isaac, who engaged in cotton manufacturing, and David and Daniel, who were machinery builders. A. & I. Wilkinson started mills at Valley Falls and Albion. When the disastrous time of 1829 came, all the Wilkinsons lost heavily, and eventually their mills and shops passed into other hands.

The most famous of Oziel Wilkinson's sons was David. He became a very skillful machinist and developed great talent as an inventor. In 1797 he invented a gauge and sliding lathe, and obtained a patent for it the following year, but before he realized any profit the patent expired. Fifty years afterward Congress voted him $10,000, as a partial recompense, many machines constructed on the principle he had invented being in use at the different national arsenals and armories. David Wilkinson forged the iron work and turned the spindles and rollers for Slater's first machines, and it is probable that he made the machinery for the Old Mill. Soon after he began the systematic construction of cotton machinery, being without doubt the first American builder. He occupied as a machine shop, the lower floor of the stone factory constructed by his father in 1810. About the year 1813 he removed his business to the south side of Main Street near the bridge, where he remained until his failure in 1829. It was in this shop that the first power-looms introduced by Gilmour were built. He was one of the original directors of the Cohoes Company, which was organized to develop the water-power at Cohoes Falls, on the Mohawk River, New York state. After his failure in 1829 he removed to Cohoes on the urgent invitation of some of the members of this company, and early in 1831, in company with his brother-in-law Hezekiah Howe, who had also been his business associate in Pawtucket and Wilkinsonville, established a shop for the manufacture of cotton machinery. These two men bore an important part in the development of Cohoes. Mr. Wilkinson, however, while retaining his interest there did not long remain in Cohoes, but engaged in the building of bridges and canals in various sections of the country. He died February 3, at Caledonian Springs, Prescott County, Canada West, aged 81 years.

Timothy Greene, one of Oziel Wilkinson's sons-in-law, and a partner in the White and the Wilkinson & Greene mills, aided materially in the industrial development of Pawtucket. He was born in Warwick, June 12,

1760, and was a shoe-maker by trade. He came to Pawtucket some time after Oziel Wilkinson, and started a tannery. In 1810 the other partners bought out Mr. Slater's interest in the White Mill, and from that time ran the business under the style of Wilkinson, Greene & Company. When the mill was burned in 1824, it was immediately rebuilt by Timothy Greene & Sons. The Greenes were seriously affected by the financial troubles of 1829, but partially recovered themselves. The factory long known as the Greene Mill and at present as Hicks' Mill, which is built over Sergeant's trench near its entrance into the river, occupies the site of Timothy Greene's tannery.

Sylvanus Brown, in whose house Samuel Slater spent his first night in Pawtucket, and who assisted Slater in building his first machines, performed services worthy of remembrance. He was a mechanic of unusual skill. At the close of the Revolutionary War he was engaged by the governor of the British provinces to go to Halifax and erect a number of saw and grist mills, for which all the iron work was made in Pawtucket, and fifty Pawtucket mechanics were engaged by Mr. Brown to accompany him. Two years were spent on this enterprise, and seven saw mills and two grist mills were built. Such was the confidence in his ability in his own line, that to him Moses Brown naturally turned for advice regarding Slater's ability, and he was evidently the man best fitted to perform the task of helping Slater. After returning from his labors in the British provinces, Mr. Brown built Quaker Lane, which extended from Main Street to the Landing, and substantially followed the lines of the present beginnings of East Avenue and Pleasant Street. It received its name from the fact that Oziel Wilkinson, Timothy Greene, Benjamin Arnold and other substantial citizens who were members of the Society of Friends, owned property and had their houses in the neighborhood. The building where Samuel Slater and Sylvanus Brown began the construction of the cotton machinery was situated on this lane. Behind locked doors and windows shielded by shutters and blinds the two men worked, their only assistant being an old negro named Samuel Primus or Primus Jenks, who did the rough parts of the work and supplied what power was needed by the application of his own muscles to the wheels. Very much of the success of Slater's undertaking was owing to Sylvanus Brown's skill, patience and faithfulness. According to some traditional accounts he discovered the means to make the cards work, a difficulty that had given Slater much trouble, and had been the means of almost causing him to throw up the undertaking. Mr. Brown invented, soon after the first spinning machines were in operation, a slide lathe for turning rollers, a machine for fluting them, and other appliances for use in building machinery. These inventions were used in constructing the machines put into the Old Mill, and they proved of great value in aiding the development of the manufacture in subsequent years. Sylvanus Brown's son, James S. Brown, and his grandson, James Brown, have well sustained his reputation, and as builders of cotton machinery have followed worthily in his footsteps.

Among other Pawtucket mechanics who were prominent during the first part of the century were Larned Pitcher, Ira Gay, John Thorp and Asa Arnold. The latter invented the differential motion for speeders, and also devised a machine for separating wool; Ira Gay invented a dresser and a speeder, and the others were successful inventors and machinery builders.

The Jenks family has always borne an important part in the industrial life of Pawtucket. Although the records of the successive forge and shops that were established from the time of the first Joseph Jenks are very meagre, yet it is known that his descendants were men of enterprise and followed in their ancestor's footsteps. Captain Stephen Jenks manufactured muskets in Pawtucket during the year 1775. The great freshet of 1807 carried away many of the buildings in the neighborhood of the falls, including all on the "forge lot," so called, which extended from the western end of the bridge to the lane now called Jenks Avenue. This lot was the original location of Pawtucket's iron industries, and was owned by the Jenks family. After the flood new structures were immediately erected. Eleazer Jenks and his sons, Stephen and Eleazer, Jr., rebuilt the forge shop; Moses Jenks built a grist mill, and his sons Pardon and Jabez, erected a building for carding. In the forge shop a trip hammer was operated, heavy forging was done and mule spindles were manufactured. Stephen Jenks here had a machine of his own invention for cutting spikes. He also started a cotton picker, the first in Pawtucket, and with it picked all the cotton for the neighboring mills. Previously the raw cotton had been sent out to families to be picked, but very soon after Mr. Jenks started his machine it was brought to the forge shop from all the mills for miles around, and was returned in bags in condition to be used. This business was continued until about 1817 or 1818, when pickers came into general use in the mills.

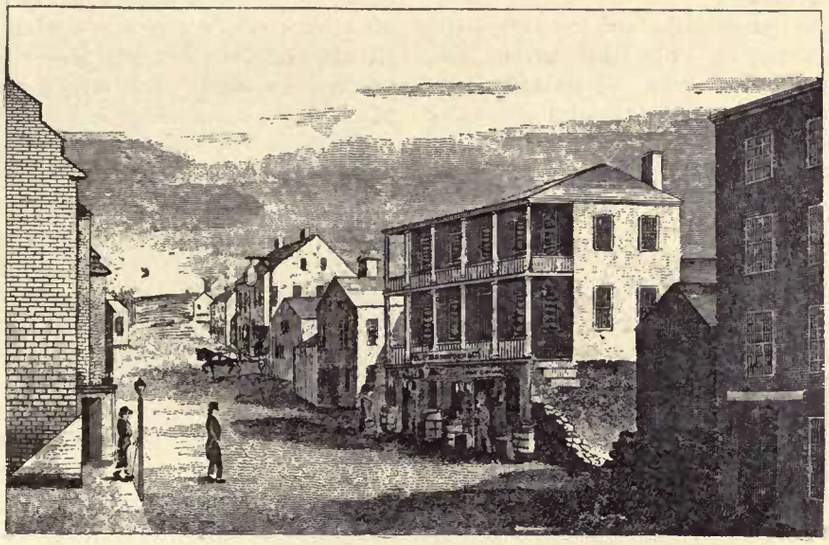
Dr. Dwight writing in 1810, after a visit to Pawtucket said: "The village is well built and wears a flourishing aspect. . . . There is probably no spot in New England of the same extent in which the same quantity or variety of manufacturing business is carried on." The same writer says that in 1796 "there were here three anchor forges, one tanning mill, one flouring mill, one slitting mill, three snuff mills, one oil mill, three fulling mills, one clothier's works, one cotton factory (the Old Mill), two machines for cutting nails, one furnace for casting hollow ware—all moved by water—one machine for cutting screws, moved by a horse, and several forges for smiths work."

At the beginning of the century the number of dwellings in Pawtucket was only a few over fifty,—seventeen on the east side and about twice as many on the other. There was only one street on the east side, and that followed the lines of the present Main, Walcott and North Bend streets. On the west side there were only four short streets, Main extended from the bridge to High Street, and beyond that as a lane as far as what is now Dexter Street; Mill Street, now North Main, was only a narrow road leading as far as Slater's mill; High Street extended as far as the present high school building; Quaker Lane was the present East Avenue to

the junction of Pleasant Street, and beyond it continued as a narrow highway to Providence.

The Rehoboth side of the river seems to have attracted cotton spinners to a greater extent than the western side. Thus in 1812 Rehoboth had eight factories with a capacity of 9,438 spindles, while in North Providence there were only five mills with 6,700 spindles. Probably these figures included mills not in Pawtucket, but in other parts of the two towns. The North Providence side was, however, the larger of the two places and had more general business.

In 1819 the Rhode Island Pawtucket consisted of eighty-three dwelling-houses, twelve stores, two churches, a bank, post-office, academy, several schools, three cotton mills and six machine shops, all of which were located on the four streets in the near neighborhood of the river. In the Pawtucket shops machinery was constructed for cotton mills in all parts of the country, and was sent to places in Connecticut, Massachusetts, Vermont, to Trenton, N. J., to the factories near Baltimore, Md., to Pittsburg, Pa., to Delaware, Virginia, North Carolina, Louisiana, and Georgia. This business continued until 1829, when the failures of the Wilkinsons and others gave Pawtucket a blow from which she did not recover for many years, and which operated to retard her development while other and younger places were becoming great cotton centres.



VIEW ON EAST SIDE, 1825.

(From an old print.)

Among the most interesting features of Pawtucket are various old factories, built by Slater and his contemporaries, which are still in existence and use. Chief among these, is the historic Old Slater Mill. The building as seen to-day, is a modern-looking wooden structure, two-stories and a half in height, the main portion ninety feet long by forty-five feet wide, with a continuation fifty by twenty-five feet, which extends to the river, thus making the total length 140 feet. It stands at right angles to the course of the river, and the east end is directly on the river bank overlooking the upper falls. Originally the Old Mill was a small two story building about forty feet long by twenty-five wide. The extension toward the river is said to have been built about 1820, and other additions were made in subsequent years. The mill came into the possession of Francis Pratt and Job L. Spencer in 1864, at which time it consisted of the original building and the extension, while a one-story ell was situated alongside the larger part of the building on the same side with the tower. Messrs. Pratt and Spencer remodeled the entire structure by adding a half story to the main building, and carried up the one-story part to the same height as the rest of the edifice, at the same time putting on a new roof, with modern windows in place of the old low ones that had formerly served. The limits of the original structure can yet be easily discerned through means of the old timbers, which are of oak, and are roughly hewn. They are very hard and durable, and when the alterations were made in the mill the workmen found it a difficult task to cut into the staunch old oaken beams. The water-privilege here has a force of about seventy horse-power. Near by the Old Slater Mill is a three-story brick building, built by Almy, Brown & Slater, and used by them as a retail store at which the country people used to exchange their butter, eggs, and poultry for yarn to be woven at home. The Old Mill is still used for its original purpose, and cotton yarns, twines, and thread are manufactured on the first floor. In an adjoining building, in the office of Mr. J. L. Spencer, who operates the cotton machinery, are some very interesting relics. Here is the original lock of the mill door. It is eighteen inches in length, nine broad, set in oak, with an iron key nine inches in length. This key has recently been lost. There are a few other relics, among them being five spindles, with their stands and fixtures, and a head of steel rollers, from the first spinning machines. Here there is also a yard stick that saw service in the retail store in Slater's time.

Next in age to the Old Mill, is the structure on the east side that has always been known as the White Mill. The erection of this factory was begun in 1799, and it was ready for operation in 1801, the firm being Samuel Slater & Company. Mr. Slater withdrew in 1810, when the style was changed to Wilkinson, Greene & Company. In 1824 the mill was burned, but was immediately rebuilt in an enlarged form by Timothy Greene & Sons. It is still known by its old name, is used as a spinning mill, and presents substantially the same appearance as in 1824.

Wilkinson, Greene & Company erected a stone mill just north of the White Mill in 1813. The same fire that destroyed the original White Mill also burned this structure. It was long known as the Wilkinson and Greene Mill, and the name has survived many changes

in owners, so that locally it is still known by this name among old residents. The property came into the possession of N. G. B. Dexter after 1840, and he, his sons and their successors have since then operated it as a spinning mill. Many changes and additions have been made to the original factory. A fire which occurred the night of December 31, 1890, partially destroyed the wooden portions, but the old stone part was not much damaged except by water. In the wooden tower at the front, facing Broadway, is a stone set in under the door with the words "Built in 1813." This factory is now generally known as the Dexter Mill.

In 1810, Oziel Wilkinson built the stone mill that now stands on the bank of the Blackstone, in the rear of North Main Street, and but a short distance south of the Old Mill. After the failure of the Wilkinsons in 1829, it came into the possession of Thomas Le Favour, and since then has been known locally as the Le Favour Mill. It is now occupied in part by the Pawtucket Gas and Electric Light Company.

A portion of an old stone mill, built in 1813, is still standing on River Street, the other part having been pulled down in 1887 to make room for an addition to D. Goff & Sons' mills. At the southeast abutment of the bridge is an old wooden structure known as the Bridge Mill. This was originally known as the Yellow Mill, and was built in 1805.

No bridge spanned the Blackstone for more than fifty years after Joseph Jenks built his forge. In summer the stream was easily fordable, and in winter it is more than likely that the ice formed a natural bridge which at first furnished all the accommodation required. But as the infant colonies increased in population, the necessity of roads and bridges began to be felt by those who were obliged to travel. May 29, 1712, a committee made a report to the Massachusetts General Court recommending the building of a bridge at "Pawtucket Falls, near the iron works," on the ground that it would be "of service" in traveling from some parts of Massachusetts, "into the Narragansett country, Connecticut and New York, at all times of the year, particularly in winter season, when, by rising of water, and great quantity of ice coming down the river, it is very difficult and hazardous." As a result of this action the first bridge was built in 1713, at the joint expense of the two colonies. The Rhode Island General Assembly voted to rebuild it in 1729, if Massachusetts would pay half the expense, but as that colony neglected to come to a decision, and as very likely the bridge was a fragile structure and had become unsafe, it was pulled down In a year or two, however, a new bridge was built, and this in turn was rebuilt in 1741. The first bridge spanned the river a little south of the present structure, but the second and subsequent bridges occupied the existing location. The bridge was swept away by the great freshet of 1807, but a new one was immediately built. In 1817, and again in 1832, the bridge was almost entirely rebuilt. The old bridge was torn down in 1843, and replaced by a new one at the expense of the State. The present substantial stone bridge was opened to travel November 4, 1858.

A bridge was commenced in 1826 and finished the following year, at the north end of Mill Street, and it connected Central Falls with the northeastern portion of Pawtucket. The old bridge was replaced by an iron one in 1871.

A wooden bridge was built over the Blackstone at Central Avenue, in 1853, connecting Central Falls with that section of Pawtucket known as Pleasant View. This was replaced by the present iron bridge in 1869. The Exchange Street iron bridge was built during the winter of 1871-2. In 1875-6 the Division Street bridge, the largest and most costly in the city, was built across the river a short distance below the falls, and at about the head of navigation. It consists of nine beautiful stone arches, and is carried high above the river.

The exact date of the starting of the first Sunday School in Pawtucket is uncertain, but in the opinion of careful students of local history, it was as early as 1791 or 1792. David Arnold was the first teacher and the school was kept in his house, which stood on Main Street on the site now occupied by Lee's Block. Four of Mr. Arnold's children worked for Mr. Slater in Ezekiel Carpenter's clothier shop where the first machinery was operated. The second teacher was Amariah Marsh. These teachers, and those employed for some years following, were paid by Almy, Brown & Slater, but as the advantages of the instruction thus afforded became evident, other manufacturers contributed to the support of existing schools or were instrumental in having new ones started. In the early years great difficulty was experienced in finding suitable teachers, and during the summer months, the probability is that the schools were discontinued. Sunday morning, September 15, 1799, Mr. Slater overheard some of the boys who worked in his mill, debating whether or not they would go and rob an orchard. One of them strongly opposed the project because he did not think it right. With this view, Mr. Slater agreed. He then invited the boys to his house, gave them all the apples they wanted and began himself to keep a Sunday School. Although by all accounts Mr. Slater was the moving spirit in first establishing Sunday Schools, this was probably his first essay as a teacher. He kept the school in his own house until the middle of December following, and continued it there during the summers of the next three years. This building, somewhat altered in form and appearance, is still standing at its original location on the east side of North Main Street, at the corner of a lane leading down to the Old Mill. The seven boys who made up the class were, Nathaniel G. B. Dexter, Isaac and Samuel Taber, Reuben and Whipple Alexander, Thomas Bly and Clifford Thomas. The first of these boys became in after years a successful manufacturer and one of the leading citizens of Pawtucket.

One of the most interesting landmarks in Pawtucket is the "Slater Mansion" on East avenue, which was built by Mr. Slater after his second marriage, but became the exclusive property of his wife before it was completed. Here, after her husband's death, Mrs. Esther Slater continued to live until her death, December 23, 1859, at the age of 81 years. The house is a substantial brick structure in an excellent state of preservation.

The walls of the two parlors that occupy the front of the house, are covered with pictorial paper that apparently still adheres as closely as when first put on. That in the north parlor represents eastern and Oriental scenes, and was put on when the house was built. In the other room the paper was put on later and represents scenes from Scott's *Lady of the Lake*. The property is held in such a way that any lease of the building contains a clause requiring that the paper in these rooms be preserved and cared for.

During the first quarter of the century there was considerable litigation over the water-privileges at Pawtucket. Probably this was owing to the fact that there were a great many owners, each of whom wanted as large a share of the water as possible. Like the proprietors on the other streams in the state, the mill owners here and elsewhere on the river, formed corporations and constructed reservoirs in the upper portion of the Blackstone valley, by this means making the flow much more regular, and also diminishing the danger from floods. After the water-works were finished in 1878, the factory owners were awarded considerable sums for the damage done to their privileges by the taking of the waters of the Abbott Run, a tributary of the Blackstone, which unites with that river just above Pawtucket. Without doubt, the aggregate power of the river was very much lessened by the diversion of this stream, but on the other hand an advantage was gained, in that manufacturing establishments back from the river were enabled to secure water at much less expense. The upper dam has a possible force of probably more than 800 horse-power, and the lower dam of nearly twice as much, making the total at least 2,000 horse-power. This force is however only partially utilized on existing mill privileges, a very large percentage of the water flowing over the dams without being put to work turning water wheels.

PRESENT APPEARANCE OF SLATER'S FIRST RESIDENCE,

WHERE HE KEPT THE SUNDAY SCHOOL IN 1799.

An excellent system of water-works was put in operation January 31, 1878, and since that time has satisfactorily supplied not only Pawtucket, but also East Providence, Central Falls, Valley Falls, Lonsdale, Ashton and Berkeley. There are two reservoirs, one located on Reservoir Heights, two and a half miles from the business centre, and 300 feet above tide water. The other is a new reservoir situated on Diamond Hill, Cumberland, built in 1887, and first utilized February, 1888.

During the colonial period and until the building of railroads, Pawtucket was on the line of travel between Boston and Providence. As early as the middle of the last century a stage coach ran regularly between Boston and Providence. In 1825, one was put on to ply directly between Pawtucket and Boston. With the opening of the Providence & Worcester railroad in 1847, a new era dawned, and a greater industrial increase has since then taken place than ever before.

The first school established in Pawtucket was in the Red School-house, built in 1793, on High Street. For a time the children from both sides of the river were taught in this edifice, and here Sunday Schools, after their inception, were kept. For many years the only church in either village was the Catholic Baptist, afterward renamed the First Baptist. The society was formed in 1793, and a building erected the same year on the site of the present church. Two banks were organized in 1814, one on each side of the river, the Pawtucket Bank, with a charter from Massachusetts, and the Manufacturers Bank, incorporated by the General Assembly of Rhode Island. On the west side the Fire District of Pawtucket, was incorporated February 17, 1801, and organized the following April. Two years later a fire engine built by David Wilkinson was procured, and a fire company was organized. The first newspaper established in Pawtucket, or at least the first that had a continued and prosperous existence, was the *Chronicle*, started November 12, 1828; in 1839 it was united with the *Gazette*, which had been started the previous year, and under the united names has since continued in existence. Such were the small beginnings of the chief agencies in the social, moral, educational and industrial life.

Pawtucket is not an ancient town even in the sense that some places on this continent can claim that title. One hundred years cover the essential points of her history. But the story, even as briefly told in these pages, shows the all-important effects of past events on the present and future, and demonstrates that the whole trend of the life of a community depends very largely on the vigor and direction of the original impetus. An endeavor has been made to present the most salient feature of Pawtucket's history, and to illustrate by what steps the two small hamlets have become the important city of the present, with all the conveniences and advantages that a modern municipality requires. An account of present conditions and of recent industrial developments will be found in a succeeding chapter.

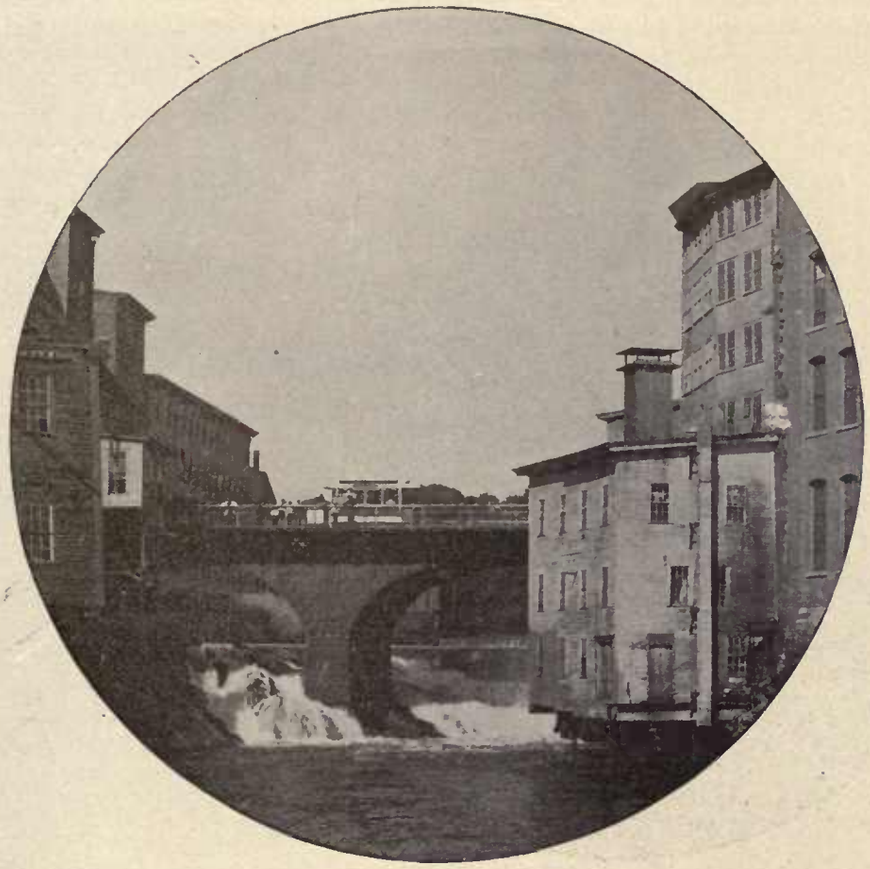
THE CITY COUNCIL COTTON CENTENARY COMMITTEE.

FRANK O'REILLY. NATHAN A. CHATTERTON. HENRY E. TIEPKE. EDWARD SMITH.
J. ELLIS WHITE. PHILO E. THAYER. BERNARD T. LENNON.

Chapter V.

THE CENTENARY CELEBRATION.

The Idea Suggested—Preliminary Steps and Preparations—Full List of Committees—Preliminary Sunday-school Exercises—First Day: Sunday-school Day—Opening of the Industrial Exhibition—Evening Banquet—Second Day: Military Day—Third Day: Trades Procession—Secret and Civic Society Procession.



PAWTUCKET FALLS AND BRIDGE IN 1890.

Photographed by Stoddard.

The idea of a grand celebration in Pawtucket, on the one hundredth anniversary of Samuel Slater's successful introduction of cotton spinning by machinery, originated, so it is generally conceded, with Captain Henry F. Jenks, who is a lineal descendant of one of the first settlers of Pawtucket. At a meeting of the Business Men's Association as early as February 1, 1886, Captain Jenks called attention to the fact that this centenary was approaching, and brought forward a plan which he had formulated for its proper observance. This plan consisted mainly of the erection of a monument to Samuel Slater, and the incorporation, in the services of dedication, of a grand military and civic display. The suggestion was received with favor, but it was four years before the time of the centennial, and the matter dropped. The idea found lodgment in the minds of many in the community who perceived the importance of the event, and the benefits which would come to Pawtucket by its realization. Later on, at a meeting of this same Business Association, Senator Aldrich, of Rhode Island, presented the subject of the observance in a strong light; and again, in February, 1889, the occasion of a banquet given to Mayor Goodwin and the city council, by H. Herbert Sheldon, Mr. Jenks advocated the project, which, as before, was received with favor. The subject began to be more freely talked about, the press in the vicinity advocated the celebration in its columns, and at the October meeting of the Pawtucket common council, Councilman Henry E. Tiepke offered a resolution calling for the appointment of a joint special committee from the aldermen and council, to consider the feasibility of a celebration of the centenary in a fitting manner. The resolution was adopted, the council called a special meeting, and the board of aldermen concurred. The joint committee was made up as follows: Aldermen Joseph E. Jenckes and Edward Smith; Councilmen Henry E. Tiepke, Bernard T. Lennon, Philo E. Thayer, J. Ellis White, and Frank O'Reilly. This was the first official action, and from it grew the centenary celebration which was observed in Pawtucket during the week beginning September 28, 1890.

It was near the close of the municipal year, and on the inauguration, in 1890, of Mayor Hugh J. Carroll, matters assumed definite shape. February 3d the Business Men's Association appointed this committee to coöperate with that from the city government: President Lucius B. Darling, Ex-President Daniel G. Littlefield, Ex-Mayor Frederick Clark Sayles, Hezekiah Conant, Lyman B. Goff, John J. Dempsey, Ex-Mayor Almon Kent Good-

win, William H. Haskell, Stephen A. Jenks, George P. Grant, Henry F. Jenks. March 13th Alderman Jenckes presented his resignation as a member of the committee from the city, and Alderman Nathan A. Chatterton was appointed; and March 19th Councilman Henry E. Tiepke was chosen chairman of this joint committee; Alderman Chatterton, treasurer; Councilman Lennon, auditor; and Councilman J. Ellis White, secretary. Conference was held frequently with the committee of the Business Men's Association — the latter committee bringing up at once the subject of Mr. Jenks' original proposal to erect a monument to the memory of Slater, proposing to take charge of that matter, and leave the city committee free to arrange for whatever industrial exhibition might be considered wise. A sub-committee to arrange for the proposed monument was appointed by the association, consisting of Captain Henry F. Jenks, Edwin Darling, Henry B. Metcalf, Olney Arnold, and William R. Sayles Mr. Jenks' idea was that the monument should be erected from stones furnished by the different manufacturers, and estimates were considered for its erection, but the plan appeared impracticable, and on June 19th the committee recommended that no further action be taken.

HON. HUGH J. CARROLL,

MAYOR OF PAWTUCKET DURING THE CENTENNIAL YEAR.

The city committee found an increasing interest on the part of the citizens and encouragement to lay broader plans for the celebration. It was early decided, after conference with the Veteran Firemen's Association, to have a firemen's muster as a feature of one day, and a regatta on Pawtucket River another; it was also decided to have a military parade, a parade of secret and civic societies and a trades procession. An industrial exhibition was also proposed, a committee consisting of Councilmen Tiepke, Thayer, O'Reilly, and White was appointed to confer with the manufacturers, and the encouragement was so pronounced that the success of this feature was assured. It became necessary at this time to attend to the financial part of the celebration, and May 1st the General Assembly of Rhode Island passed in both houses a bill appropriating $10,000 to aid Pawtucket in its centenary, and a few days later the city council of Pawtucket appropriated a similar amount. It was also decided to devote a day to horse and bicycle races at the Driving Park, and to hold an evening celebration, after the order of the "Mardi Gras," to be called "King Kotton Karnival."

A memorial was received in May from the superintendents of the different Sunday-schools, asking to have one day devoted to a Sunday-school procession in honor of the great work which Samuel Slater did as pioneer of the Sunday-school. It was decided to have such a procession, and to have public services in Music Hall the Sunday prior to the event. The appointment of General Olney Arnold as chief marshal, of Ansel D. Nickerson as clerk of the committee, and the organization of a joint committee to make arrangements for the industrial exhibition speedily followed. The organization of this latter committee was: George Mabbett, chairman; Frederick W. Easton, secretary; and Albert R. Sherman, superintendent of the exhibition. To carry out all the details of this celebration, which had been announced to open on Sunday afternoon, September 28th, with a public meeting in Music Hall, and continue through the week, the aid of the following gentlemen, on the various committees, was invoked:

CITY COUNCIL COMMITTEE. — Councilman Henry E. Tiepke, chairman; Councilman J. Ellis White, secretary; Alderman Nathan A. Chatterton, treasurer; Councilman Bernard T. Lennon, auditor; Alderman Edward Smith, Councilmen Philo E. Thayer, Frank O'Reilly; and A. D. Nickerson, Clerk.

ON INDUSTRIAL EXHIBIT.—George Mabbett, chairman; Frederick W. Easton, secretary; Albert R. Sherman, superintendent; Councilmen Thayer, Tiepke, O'Reilly, and White, and Messrs. James Brown, Samuel M. Conant, Alfred H. Littlefield, Albert Horton, Lewis Fairbrother, A. T. Atherton, George E. Sherman, Myron Fish, William L. Coop, Arthur W. Stanley, George L. Miller, C. Fred. Crawford, James Linton, Richard A. Butler, Thomas F. Clark, Walter H. Stearns.

ON SUNDAY-SCHOOLS.— Councilmen Thayer and White, Alderman Chatterton and the superintendents of the various Sunday-schools represented.

ON MILITARY.— Alex. Strauss, chairman; W. Howard Walker, secretary; Alderman Chatterton, Councilmen Tiepke and White, and Charles Rittman, Giles W. Easterbrooks, Benjamin F. Davis, Joseph E. Mason, Edward F. Jones, Joseph E. Burns, John F. Clark, Theodore F. Dexter, Joseph F. Means.

ON TRADES PROCESSION.—Everett P. Carpenter, chairman; Frank M. Bates, secretary; Councilmen Tiepke, Thayer and O'Reilly, and Waterman W. Dexter, David Harley, Fred. W. Dexter, J. D. Billington, C. Makin, J. W. Wilmarth, B. McCabe, E. K. Gridley, R. H. Kirk, J. F. Abbott, H. A. Brown, C. E. Longley, J. M. Payne, D. A. Jillson, Timothy Butler, J. Shartenberg.

ON CIVIC AND SECRET SOCIETY PARADE.—William M. Peckham, chairman; Charles A. Spooner, secretary; Councilmen White and Thayer, Alderman Chatterton, and J. Edgar Sisson, Aaron Ingham, Fred. R. Rogers, Franz Donath, John S Brazeau, Owen F. Keough, Joseph B. Hunt, Henry Hill, Jr., John M. Thurber, Patrick Murphy, Silas B. Havens, George C. Gates, Aaron Lund, James F. Hanley, John L. Perrin, James Meiklejohn, James H. McGee, Herman V. Babcock, John J. Kenyon, Henry G. Duby, David Shawcross, Owen McDonald, William H. Gurney, Andre Blanchard, Frank Marchetti, Michael Nolan.

ON FIREMEN'S MUSTER.—Joshua Lothrop, chairman; Councilman Thayer, secretary; N. Curtis Fletcher, assistant secretary; Councilman O'Reilly, John Brierly, Eugene B. Crocker, Albert C. White, Oren S. Horton.

ON REGATTA.—A. R. Sweet, President Pawtucket Boat Club, chairman; S. Willard Thayer, secretary; Alderman Smith, Councilman Lennon, Isaac Gill, Captain Pawtucket Boat Club; C. Fred. Crawford, Lyman H. Burr, Albert W. Bensley, Chas. W. Crowell, Wm. O. Graham, Frank E. Holmes, Charles H. Lawton, James A. Nealey, John B. Reilly, Alanson Thayer, Charles E. Carpenter, Fred. W. Dexter, Harry M. Horton, George J. Kirby, William L. Mahoney, Frederic G. Perry, Arthur J. E. Readio, E. O. Woodbury, Frank E. Crawford, David McKelvey, John S. Cottrell, Alonzo E. Flint, David Harley, Harvey Kingsley, Patrick McLoughlin, Alfred W. Quigg, Arthur B. Tyler, James L. Wheaton, Jr.

HONORARY COMMITTEE.—His Excellency Governor John W. Davis, His Honor Mayor Hugh J. Carroll, President of the Common Council Frank O'Reilly, Honorable William F. Sayles, Albert Horton, Fred. W. Easton, W. Wanton Dunnell, Evarts C. Tyler, William P. Moroney, Isaac Shove, Waterman W. Dexter, Hiram Kendall, President Narragansett Boat Club.

ON HORSE AND BICYCLE RACES.—Councilmen O'Reilly, Lennon and Thayer, and Henry L. Spencer, Frank H. Gurry, Hector Schiller, Richard T. Keene, Hugh Linton, Bradford Gannett, James Linton, J. Ellis Tingley, Ferdinand A. Follett, W. Wanton Dunnell.

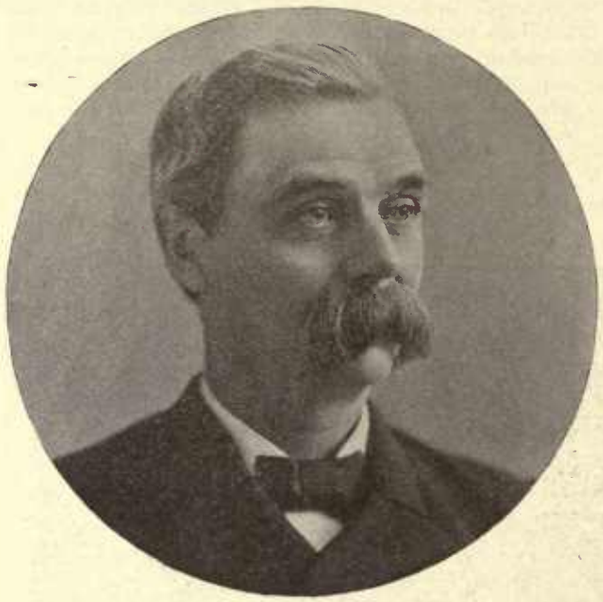
ON KING COTTON CARNIVAL.—Eugene B. Crocker, chairman; Fred. W. Dexter, Treasurer; Horace W. Davenport, secretary; Councilmen Tiepke and Lennon, and W. Howard Walker, J. Milton Payne. James H. Winters, Bert. J. Horton, Charles E. Harrison, Charles Rittman, Benj. F. Davis, H H. Sager, A. Cohen, J. S. Brazeau, E. K. Gridley, J. W. Little, J. W. Larkin, D. J. White. John Coyle, E. W. Bucklin, W. J Mahoney, Franz Donath, Alexander Strauss, Aaron Ingham. G. D. Wilson, Dennis A. McElroy, John Cullen, Frank Marchetti, Henry. L. Spencer, R. A. Barber, Hector Schiller, John F. Abbott, Francis Pratt, George H. Sherman, Claude J. Farnsworth, Joseph F. Means, Theodore F. Dexter, Joseph E. Mason, John F. Clark, Thomas D Sweetland, Antoine

VIEW OF MEMORIAL ARCH AND BROAD STREET FROM TRINITY SQUARE.

Photographed by Bebby.

Spencer, C. H. Baker, Stephen W. Jenks, Samuel B. Hyndman, George C. Newell, Thomas Martin, Augustus Schroeder.

SUB-COMMITTEE ON BALL.— E. K. Gridley, chairman: Fred. W. Dexter, secretary and treasurer; Benjamin F. Davis,



ANSEL D. NICKERSON,

CLERK OF THE CENTENNIAL COMMITTEE.

auditor; Eugene B. Crocker, John Cullen, Charles Rittman, Elisha W. Bucklin, James W. Larkin.

ON RECEPTION.— Honorable Hugh J. Carroll, chairman; Bernard McCabe, secretary; Councilmen Tiepke and White, Alderman Smith, and the members of the Board of Aldermen and Common Council, and Governor John W. Davis, ex-Mayor Almon K. Goodwin, General Olney Arnold, John T. Maguire, William P. Moroney, Colonel Patrick E. Hayes, Daniel G. Littlefield, George E. Newell, George H. Fuller, Charles E. Longley, Albert Horton, Peter B. McManus, William H. Haskell, George H. Webb, General William R. Walker, Honorable Henry B. Metcalf, Henry C. McDuff, Francis Conlon, James Murphy, Lyman M. Darling, Frederick W. Easton, Thomas P. Barnefield, Frederick A. Barker, William W. Dunnell, Earl S. Binford, Robert D. Mason, George W. Newell, Edward L. Freeman, Rev. Joseph J. Woolley, Alden W. Sibley, Jude Taylor, George W. Payne, Hezekiah Conant, Isaac Shove, Edwin A. Perrin, James A. Nealey.

ON THE PRESS.— Edward P. Tobie, chairman; Philip C. Sheldon, secretary; Councilmen Tiepke, White and Lennon, and Frank E. Greenslitt, John J. Rosenfeld, Martin Murray, Charles A. Lee, Joseph W. Freeman, John S. Brazeau.

ON MANUFACTURES.— Councilmen Thayer, Tiepke, O'Reilly, and White.

ON MUSIC.— Councilman White, and Aldermen Chatterton and Smith.

ON PRINTING.— Councilmen O'Reilly and Thayer, and Alderman Smith.

ON BADGES.— Councilman Lennon, Alderman Smith and Councilman Thayer.

ON RAILROADS.— Councilmen Tiepke and White, and Alderman Chatterton.

ON ROOMS AND CLERK.— Councilmen Lennon, Thayer and White.

ON DECORATIONS.— Alderman Smith, Councilman O'Reilly and Alderman Chatterton.

ON PROGRAMME.— Councilman White, Alderman Chatterton and Councilman O'Reilly.

INTRODUCTORY SUNDAY SERVICES.

The preliminary exercises of the cotton centenary celebration began Sunday afternoon, September 28th, in Music Hall, Pawtucket, at 4 P. M. On the platform were seated Governor John W. Davis, members of the city council centenary committee, Ex-Governor Littlefield, clergymen of Pawtucket and the neighboring villages, and distinguished state and national officials. The services opened by singing the doxology, in which the large audience joined, after which Honorable Henry B. Metcalf, chairman of the meeting, delivered an introductory address, contrasting the industry of one hundred years ago with that of the present day, which is no less marked than that of the Sunday-school first taught by Slater as compared with the schools of to-day. After prayer by Rev. George Bullen, D. D., and singing "O God, our Help in Ages Past," an address was given by Rev. Porter M. Vinton. It related chiefly to the work of Slater in the Sunday-school in the locality of Pawtucket. "Thank and Praise Jehovah's Name" was then sung. A historical paper tracing the Sunday-schools of the vicinity from their origin to the present time was read by Ansel D. Nickerson, Esq. Another hymn, "Soon May the Great, Glad Song Arise," was sung. Rev. Alexander McGregor made a brief address, and the exercises

CAPT. HENRY F. JENKS,

ORIGINATOR OF THE IDEA OF THE COTTON CENTENNIAL.

closed with singing "Kingdoms and Thrones to God Belong" and the benediction by Rev. Emery H. Porter.

There was also a service in St. Joseph's Church, Sunday afternoon, at which an address was delivered by Rev. Fr. H. F. Kinnerney which was notable for its liberal

reference to the work of Slater and that of Roger Williams in Rhode Island. He paid a glowing tribute to Slater, saying that he built Providence and Pawtucket, the states of Rhode Island and Massachusetts, and made possible through the United States the erection of cotton mills twenty-five years before they would otherwise have existed. The exercises at this church closed with the Benediction of the Sacrament.

SUNDAY-SCHOOL DAY.

The formal exercises of the celebration opened Monday morning with a grand procession of the Sunday-school children of Pawtucket, reinforced by schools from Lonsdale, Central Falls and Valley Falls. It is estimated that there were from four to six thousand pupils in line. The procession moved shortly after 9 A. M., under the lead of Col. Alonzo E. Pierce, marshal, in the following order:

Police skirmishers, Officers Sword and McDuff.

Police Platoon, Officers Reynolds, Wilbur, Ramo, Arthur, Smith and Hand, in command of Officer Tompkins.

Carter's Band of Boston, Thomas Henry, leader; thirty pieces.

CHIEF MARSHAL, COL. ALONZO E. PIERCE.

MARSHAL'S STAFF: Alderman N. A. Chatterton, Councilmen John H. Moore, Henry E. Tiepke, Peter Lennon, B. F. Lennon, Philo E. Thayer and F. F. Halliday.

Superintendent of Schools Henry M. Maxson; Division Commander G. A. R., Benjamin F. Davis.

STAFF OF SUPERINTENDENTS: Henry B. Metcalf, Pawtucket; James M. Davis, Central Falls; W. O. Brown, Central Falls; E. L. Freeman, Central Falls; A. J. Nickerson, Pawtucket; H. S. Johnson, Pawtucket; A. D. Nickerson, Pawtucket; John Colwell, Lonsdale; Henry McLean, Central Falls; A. A. Thompson, Pawtucket.

FIRST DIVISION.

MARSHAL, ANSEL D. NICKERSON.

Aids, Philip C. Sheldon, George W. Cole, D. Webster Bullock.

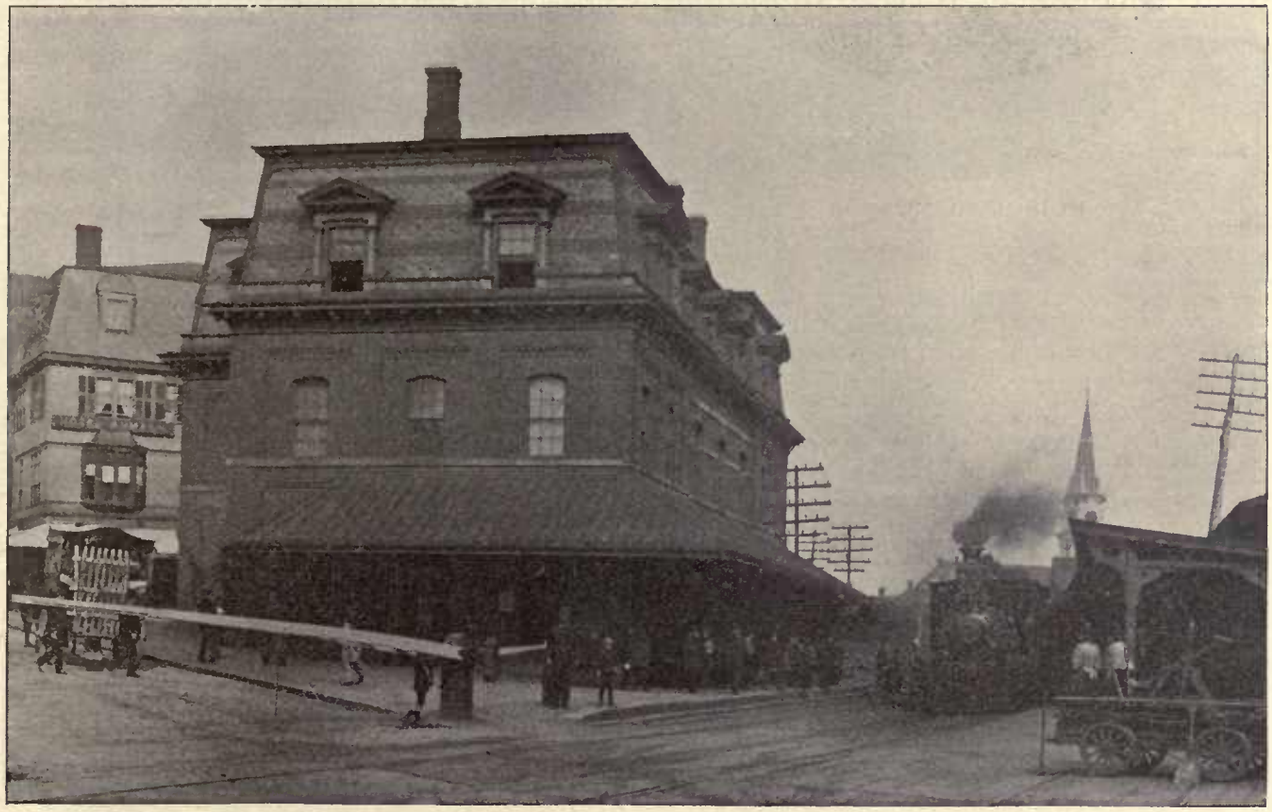
First Baptist Sunday-school. — Rev. George Bullen, pastor; Ansel D. Nickerson, superintendent; Philip C. Sheldon, assistant; 260 pupils and teachers.

Woodlawn Baptist Mission. — Hiram S. Johnson, superintendent; George E. Nicholas, assistant.

Valley Falls Baptist Sunday-school.—Rev. B. H. Lane, pastor; David Howell, assistant superintendent; Miss Lizzie Griffin, primary school; 60 pupils.

Lonsdale Baptist Sunday-school.—Rev. N. B. Wilson, pastor; John Colwell, superintendent; 100 pupils.

First Presbyterian Sunday-school, Lonsdale.—Rev. John Montgomery, pastor and superintendent; 25 pupils.



THE RAILROAD STATION, PAWTUCKET.

Embury Methodist Sunday-school. Central Falls.—Rev. Joshua A. L. Rich, pastor; Henry McLean, superintendent; Edgar Spears, assistant; William H. Broadbent, marshal; 175 pupils.

Thomson Methodist Sunday-school, Pawtucket.—Rev. J. H. Newland, pastor; A. A. Thompson, superintendent; 100 pupils.

First Methodist Sunday-school, Pawtucket.—Rev. P. M. Vinton, pastor; Alonzo J. Nickerson, superintendent; C. H. Darling, assistant; 175 pupils.

High Street Universalist Church, Pawtucket.—Rev. F. W. Hamilton, pastor; Henry B. Metcalf, superintendent; Charles R. Carpenter, marshal; 200 pupils.

St. George's Episcopal Sunday-school, Central Falls.—Rev. W. W. Sever, pastor; James M. Davis, superintendent; 140 pupils.

Broad Street Baptist Sunday-school, Central Falls.—Rev. George P. Perry, pastor; Wm. O. Brown, superintendent; Charles O. Hood, assistant; 125 pupils.

Central Falls Congregational Sunday-school.—Rev. James H. Lyon, pastor; E. L. Freeman, superintendent; 225 pupils.

HON. HENRY B. METCALF,

ORATOR AT THE INTRODUCTORY SUNDAY-SCHOOL SERVICES, MUSIC HALL.

SECOND DIVISION.

Hedly's National Band, of Providence, thirty-five pieces; T. W. Hedly, leader.

MARSHAL, EDWARD W. BLODGETT.

Park Place Congregational Sunday-school.— Rev. Joseph J. Woolley, pastor; Thomas P. Barnefield, superintendent; Myron T. Kinyon, marshal; aids, Joseph Means, Frank Bishop, John W. Little and Rev. J. J. Woolley. Ladies in charge of children: Miss Mary Brown, Mrs. J. W. France, Miss Boyer, Miss Annie Nickle, Miss Nellie Crandall, Mrs. M. R. Allen, Miss Ella Payne, Miss Fannie Gormley and Miss Georgiena Murray. 650 pupils and teachers.

Roland C. Thatcher, wheeling a baby carriage, trimmed with bunting and flags, containing his little daughter Bessie.

St Paul's Episcopal Sunday-school, consolidated with the Mission of the Advent school.— Rev. E. H. Porter, rector; George F. Merriss, marshal. 250 pupils.

THIRD DIVISION.

MARSHAL, JEREMIAH F. BROWNING.

Aid, L. C. Newell.

Pawtucket City Band, W. E. Christian, leader, twenty-five pieces.

Pawtucket Congregational Sunday-school. — Rev. Alexander McGregor, pastor; J. F. Browning, superintendent; H. W. Harrub, assistant; George C. Newell, secretary; William McGregor, treasurer. 200 pupils. Scholars arranged by classes in charge of the following teachers: L. C. Newell, Miss Sarah Blodgett, Mrs. E. R. Clark, Mrs. C. H. Bowen, Jeremiah F. Browning, William E. Tolman, Miss Lydia Paine, Miss Ellen Bliss, Miss J. H. Morrison.

Trinity Sunday-school.—Rev. William P. Tucker, rector and superintendent; Edward C. Stiness, secretary and treasurer. Teachers—Miss Chase, Mrs. Hill, Mrs. Aumann, Mr. Morrison, Mrs. C. E. Richardson, Miss Susan Clarner, Miss Maude Makin, Miss Carrie Graham; 95 pupils.

Free Baptist Sunday-school.—Rev. Charles S. Frost, pastor; Edwin N. Chace, superintendent; M. H. Leavens, assistant; Arthur Babbitt, secretary; Edgar Nickerson, treasurer. Teachers—George Shaw, M. H. Leavens, Emily Wheeler, Minnie Wheeler, Mrs. Joshua Fuller, Mrs. James Monkhouse, Minnie Pierce, Maude Pierce; 125 pupils.

Union Mission Sunday-school.—A. B. Brown, superintendent; William Franklin, assistant; Theodore Pierce, secretary; George Miller, treasurer; 27 pupils.

Church of the Good Shepherd Sunday-school. — Rev. Benj. Eastwood, pastor; Silas Woodcock, superintendent. Teachers—Miss Lizzie Ullrich, Maggie Ludgate, Bessie Harrington, Jennie Brown, Mr. Healey, Annie Ray, Sarah Hunt, Emily Hunt, William Harrington, Miss Eastwood, Mrs. Rodgers; 160 pupils.

Pleasant View Baptist Sunday-school. – Rev. Edwin Bromley, pastor; Moses Pollard, superintendent; W. Bromley, assistant; J. Lewis Wightman, marshal. Teachers—Mrs. John Barry, Mrs. Watjen, Maria Andrews, Marian Holbrook, J. Lewis Wightman, Mrs. Rice, Mrs. Alice Powers, Miss Annie Wilbur, Miss Mamie Buffum, Miss Addie Duxbury; 100 pupils.

FOURTH DIVISION.

MARSHAL, W. O. BROWN.

Open barouche containing Mayor Carroll, Joseph Carter, William P. Moroney, and James Warburton of Haverstraw, N. Y.

Open barouche containing Rt. Rev. Thomas M. Clark, Episcopal Bishop, R. I.; Rev. E. B. Andrews, President of Brown University.

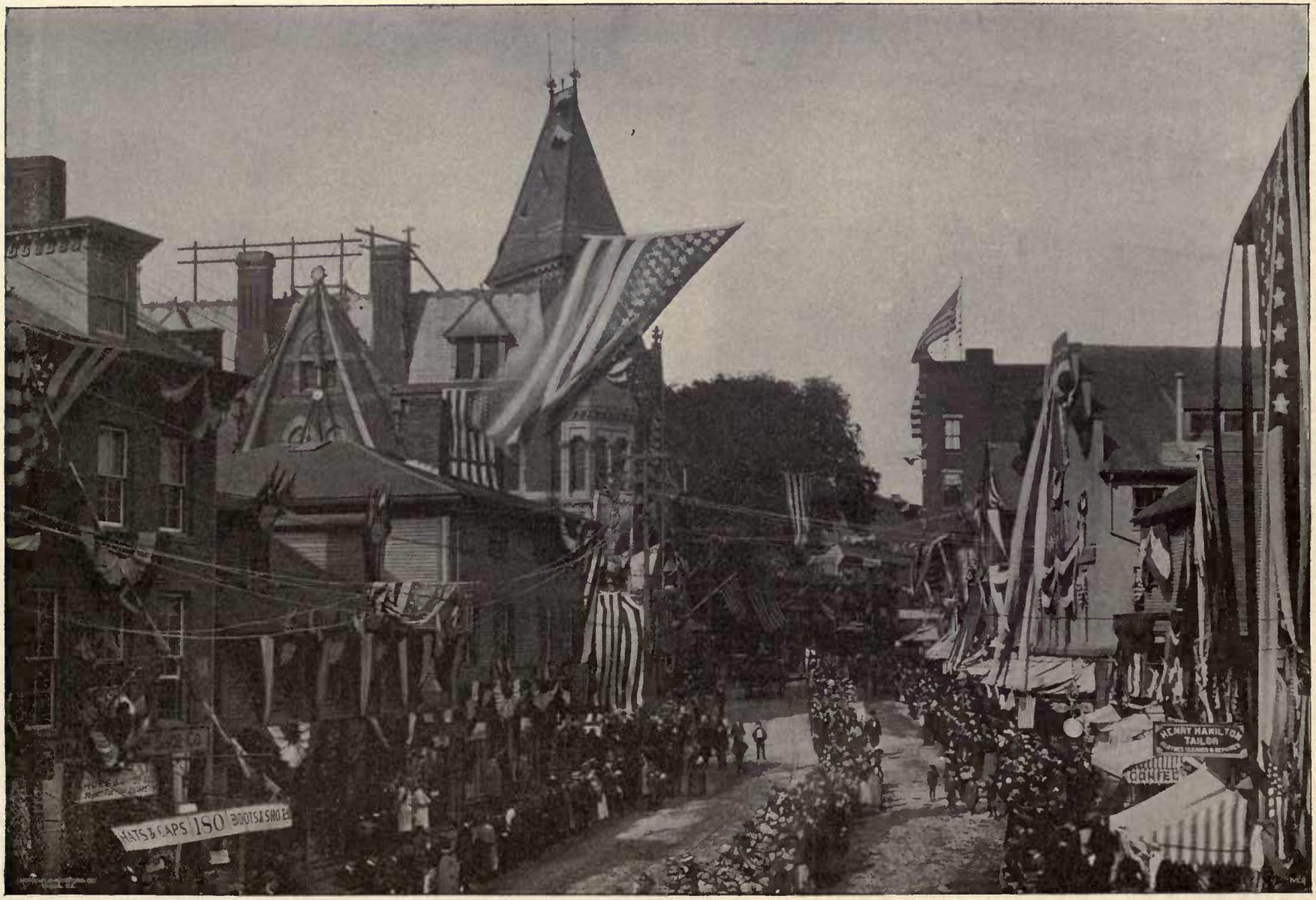
Open barouche containing Thomas P. Barnefield, Mr. Jared Sherman of Fairhaven, Rev. A. E. Dunning, D.D., Boston.

Barges containing the aged and young of the following Sunday-schools: First Baptist, Advent Mission, Pawtucket Congregational, First Methodist, Park Place, Thompson Methodist, Church of Good Shepherd, Woodlawn Mission, Union Mission, all of Pawtucket; First Congregational, Embury Methodist and St. George, all of Central Falls.

The procession was a novel sight. The children marched along in fours with a white satin badge attached to the left breast, and each school carried a banner, on all of which was inscribed the date of organization, as well as the name of the school. Among the distinguished guests were James Warburton, of Haverstraw, N. Y , a resident of Pawtucket forty-five years ago, and a Sunday-school boy, and Jared Sherman, of Fairhaven, Mass., who is over ninety years of age, and attended Slater's Sunday-school. The procession moved towards Dunnell Park, where a large crowd had gathered and where formal exercises were held. Seats had been provided for invited guests and the smaller children, but the larger number remained standing. After music by the band the introductory address was made by the Hon. Thomas P. Barnefield, all the children sang America, Bishop Thomas M. Clark, of Rhode Island, offered prayer, to which the children responded by singing the Lord's Prayer to the music of "Home, Sweet Home," Mayor Carroll delivered an address of welcome, there was more music, and brief remarks by President

ALONZO E. PIERCE,

CHIEF MARSHAL SUNDAY-SCHOOL PROCESSION.



SUNDAY-SCHOOL DAY—PROCESSION PASSING DOWN MAIN STREET.

Photographed by Bebby.

E. Benjamin Andrews, of Brown University, and Rev. Albert E. Dunning, D. D., of Boston. After Mayor Carroll's address a very interesting incident took place. It was announced that in Slater's native town in England a meeting was being held similar to that which was being participated in, at Dunnell Park. The children were wearing the same badges, and the following cablegram had just been received:

Mr. President, Teachers, Scholars and Friends:

Claremount, Tottington, Lancaster, send cordial greetings to friends and American Sunday-schools.

We hail your bright Centennial day;
For richer blessings still we pray.

SAMUEL KNOWLES.

In response to a tremendous "aye" this response was cabled:

Samuel Knowles, Tottington, England:

The assembled Sunday-schools of Pawtucket send fraternal greetings to the Sunday-schools of England.

Read III John, second verse.

May our common work have continuous and increasing prosperity on both sides of the ocean.

THOMAS P. BARNEFIELD, *Chairman.*

OPENING OF THE INDUSTRIAL EXHIBITION.

Monday afternoon, at 2 o'clock, the industrial exhibition was opened in Centenary Hall. This was an event of much importance, and the attendance was large. Governor Davis, Mayor Carroll, the city council, and invited guests occupied seats in the north gallery. After music by Carter's band, George Mabbett, chairman of the industrial committee, who presided, introduced Mr. Henry E. Tiepke, the chairman of the city council committee, who delivered an address reviewing the work which had been accomplished in preparing for the event of the day. There was also an address by Governor John W. Davis, and more music, after which the superintendent, Hon. Albert R. Sherman, pressed the button which connected with a gong in the exhibit of the Pawtucket Steam and Gas Pipe Co., in machinery hall, and in an instant the Armington & Sims engine began its revolutions, and the exhibition was declared formally opened.

HON. THOMAS P. BARNEFIELD,

CHAIRMAN OF SUNDAY-SCHOOL SERVICES, DUNNELL PARK.

Through the week, and the following one, large numbers of people from the State, and neighboring States, visited this exhibit. The school children were invited to attend in the afternoon, the two last days of the exhibition, and the privilege was eagerly accepted. The main building provided was found to be inadequate for the purposes desired, and an addition, and finally a second one was put on, and every inch of room available was occupied by exhibitors. The machinery was largely in the first annex, and here it was designed to show the process of the manufacture of cotton goods in various forms, from the beginning. The interior of the building was decorated with bunting, in front of the gallery was a large portrait of Samuel Slater, and in the interior of the main hall was a design for a monument to the memory of Slater, originated by Superintendent Sherman and which attracted much attention, the more so, because the original idea of a monument was not carried out. There was also erected a representation of a building in the form of a cross, with equal wings, the frame-work covered with every variety of cotton material which it was possible to obtain. This was called the Slater Pavilion. A representative of Superintendent Sherman searched out every kind of material made from cotton that could be found from any source, and one yard or more of each was obtained. The cotton material was put on in folds, and the varieties cost from three cents to $1.25 per yard. Every mill in Fall River had a representation on the covering to this pavilion, and the estimated cost was $175. There were two rooms in the interior, in which were displayed the Slater relics, and others more or less connected with the industry which he represented. There were shown a fire bucket of the date 1797, a thread winder one hundred years old, used by William Allen of Pawtucket, a clock used by Slater and a chair that came over in the Mayflower, an old spread decorated with blue flowers, woven by Mrs. Hannah H. Whitman in 1750, and other articles of ancient date, including a bed quilt made of cloth woven by Slater. There was a chair, a collection of pottery, an old sideboard and the piano which belonged to Slater; a shuttle 150 years old, a basket made by Jared Sherman after he had passed his ninetieth birthday, and a sample of the first piece of cloth made in this country after the embargo on English goods in 1812. There was to be seen also, the old lock from the old duck mill in Central Falls, the model of Eli Whitney's cotton gin, and the sword of John Howard Payne, the author of "Home, Sweet Home," obtained by Hon. Amos Perry, of Providence, from Tunis.

INTERIOR OF MACHINERY HALL, INDUSTRIAL EXHIBITION.

Photographed by Bebby. Engraved by Crosscup & West.

At the southern end of the main hall, there were twelve steps covered with cotton plants, designed to represent a cotton field, and in the annex there was arranged an interesting allegorical representation. Over the entrance to the room was the sign "Almy, Slater & Brown." At a table on opposite sides, were impersonations of "Uncle Sam" and Samuel Slater — the latter seated in a chair, with different kinds of yarns before him. Uncle Sam was congratulating Slater on his success, and there were shown in this same room some of the finest cotton goods made, from the works of the Lonsdale Co., the Slater Co., and the mills of John W. Slater, Slatersville.

Two objects — the source of constant attention — were the old card and spinning frame of Samuel Slater. These were placed in the centre of Machinery Hall, the card by the side of a modern card, and the spinning frame by the side of the recent inventions. The improved card does its work by the same method, and the old spinning frame was put in operation, and produced as good cotton as could be made on any frame in existence. This frame and card had been for over twenty-five years in the upper part of the Old Slater Mill unused. They had been presented to the Smithsonian Institution by Mr. Gideon L. Spencer, and were in Washington when arrangements were in progress for the industrial exhibition. The frame could not be made to work by the Washington people, but under the direction of Superintendent Sherman it was put in running order. After the exhibition closed the frame and card were returned to Washington.

The exhibits of machinery, either for the manufacture of cotton goods or connected therewith, were in the first annex to the rear of the building, and were substantially as follows:

Brown Cotton Gin Co., New London, Conn., cotton gin.
Potter & Atherton Machine Co, Pawtucket, two lappers.
Pettee Machine Works, Newton Upper Falls, Mass., revolving flat card.
Franklin Machine Co., Providence, top flat card, and spinning frame
William Blakely, Providence, eclipse spinning ring and guide, recently made.
H. T. Carpenter, Pawtucket, two yarn balling reels.
Gunn & Brown, Lawrence, Mass., assortment of power-loom shuttles.
James Brown, Pawtucket, self-operating spinning mule, balling machine, and double spinning jenny.
S. Colvin & Co., River Point, two shuttle looms for making Lonsdale cotton.
Knowles Loom Works, Worcester, Mass., two new gingham looms.
D. T. Dudley & Co., Wilkinsonville, Mass., assortment of shuttles and irons.
Royal Weaving Co., Pawtucket, loom for making Oolah silks.

ALBERT R. SHERMAN,

SUPERINTENDENT OF INDUSTRIAL EXHIBITION.

Pawtucket Hair Cloth Co., Pawtucket, loom for making hair cloth.

Fales & Jenks Machine Co., Pawtucket, filling frame.

Charles A. Luther & Co., Pawtucket, 60 spool reel, and Stephens' four color yarn printing machine.

Woonsocket Machine & Press Co., 144 spindle speeder.

Cole Bros., Pawtucket, beaming machine.

American Supply Co., machine for making Jacquard heddles, and for making loom harnesses.

Willcomb Knitting Machine Co., universal knitting machine, built by Campbell Machine Co , Pawtucket.

Excelsior Loom & Reed Works, reed machine.

James L. Inman, Putnam, Conn., automatic banding machine.

George W. Payne & Co., Pawtucket, upright spooler.

Lebanon Mill Co , Pawtucket, knitting frame.

Campbell Machine Co., Pawtucket, lock-stitch wax thread sewing machines for harnesses and shoes.

Ernest Jacob, Pawtucket, hand loom for weaving.

J. M. Carpenter, Pawtucket, case of taps and dies.

Keach & Brown, Valley Falls, exhibition of ladies' underwear

Pawtucket Steam & Gas Piping Co , exhibit of gas fittings, plumbers' materials and electrical supplies.

Easton & Burnham, Pawtucket, 100 spindle spooler.

Steadman & Fuller, Providence, card clothing machine.

M. Buckley, Pawtucket, manufacture of files in practical operation.

Evening Tribune, Pawtucket, A. B. Taylor printing press.

W. J. Hood & T. D. Rice Manufacturing Co., Valley Falls, wood turning machine and manufactured articles.

Lyons Delany & Co., Pawtucket, exhibit of grinding and making mustard.

In the second annex were the following exhibits by local firms:

Eastern Advertising Co., calendars.

Bernard McCaughey & Co., novelties in stove furnishings.

Phillips Insulated Wire Co., weatherproof electric light wire

John T. Cottrell, doors, blinds, conductors and mouldings.

Brown Bros. & Co., Providence, all kinds of mill furnishings.

H. Hartwell Jencks, collection of old relics.

E. L. Freeman & Co., collection of pictures, made by the artogravure process, and display of stationery and blank books.

American Supply Co., various sizes of belting, including one piece 155 feet long, 53 inches wide, 5 8 inch thick, weighing 2,022 lbs., made for the Wamsutta Mills, New Bedford, Mass.

Whitinsville Spinning Ring Co., exhibit of rings and traveler clearers.

Wm. R. Walker & Son, local architectural drawings.

P. E. Thayer & Co., exhibit of fancy brushes of all kinds.

Jackson Patent Shell Roll Co., case and table of shell rolls.

Henry F. Jenks, window spring.

Hood & Rice Manufacturing Co., duplicate exhibit of wood turning.

Carpenter & Co., Mystic ranges and parlor furniture.

In the main building were the following exhibits, representing the business of Pawtucket:

R. Bliss Manufacturing Co., tennis goods and tool chests.

J. L Spencer, Agent (Old Slater Mill), cotton yarns, twines and thread.

H. L. Spencer, agent and dealer in Columbia and Victor bicycles.

F E. Wright & Co., printed goods and stationery.

F. D. Morse & Son, blank-books of various kinds.

A. W. Allen, inks of his own make.

Blanchard Bros., case of optical goods.

John J. Kenyon, fancy twines and lacings.

Deahy Bros., exhibit of dry goods.

Pawtucket Furniture Co , Glenwood ranges and furniture.

R. I Electric Protective Co., Providence, electrical supplies.

G. H. Schuyler, jewelry and novelty goods.

James Nisbet, hot-house flowers and bulbs.

Standard Bottling Co , all kinds of carbonated drinks.

Marshall & Son, exhibit of the method of making hats.

Central Falls Woolen Mill, exhibit of woolens.

T. Vacher, case of stuffed birds.

Albert L. Hitchcock, model of an automatic coal dumper, also of a steam shovel, and weather strip, and self-locking hoist for hoisting apparatus.

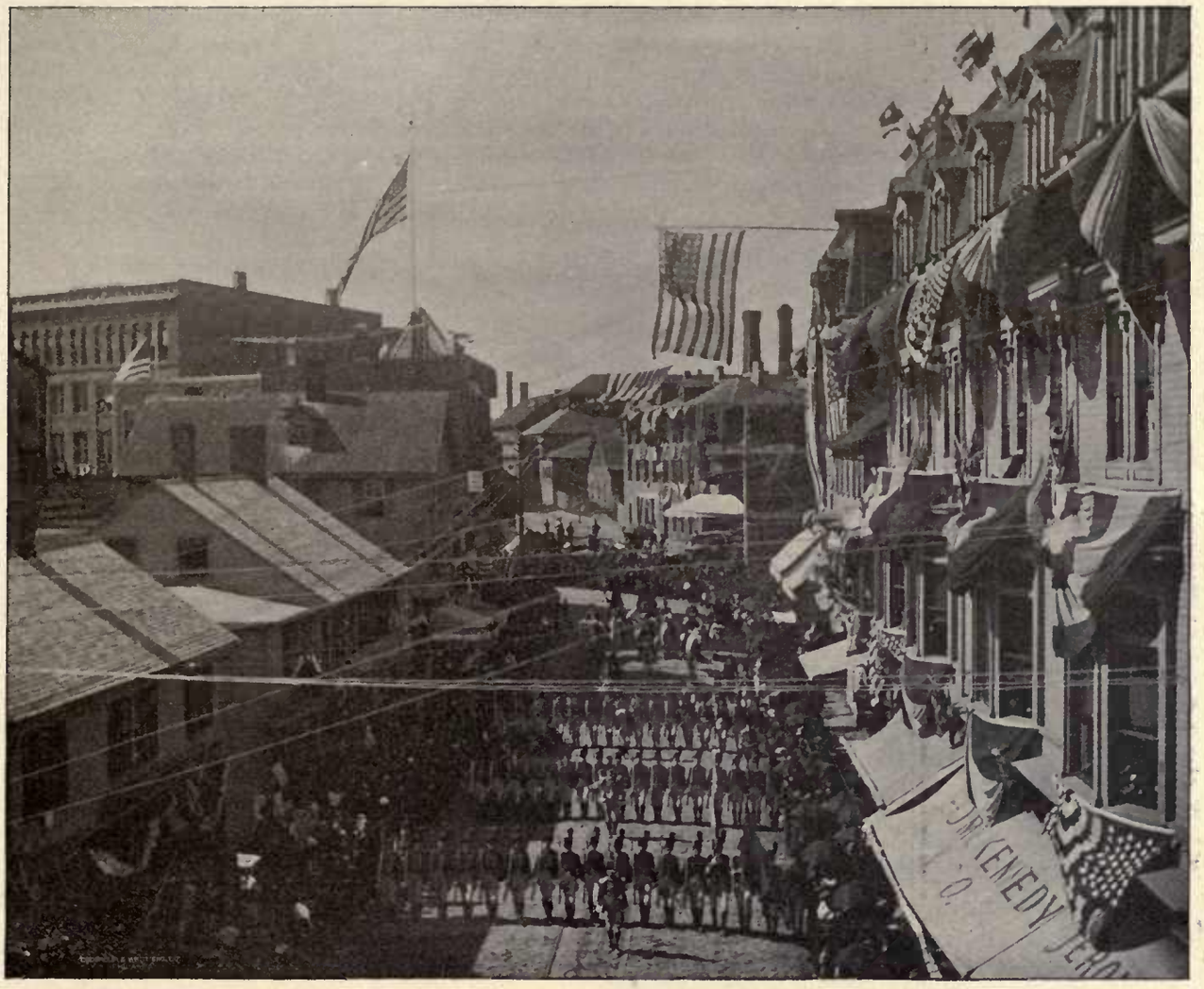
N. E. Towel Supply Co., household furnishing goods.

Ellis Thayer & Son, assortment of brushes.

B. A. Gage & Co., woolen knit goods.

GEORGE MABBETT,

CHAIRMAN OF INDUSTRIAL EXHIBIT COMMITTEE.



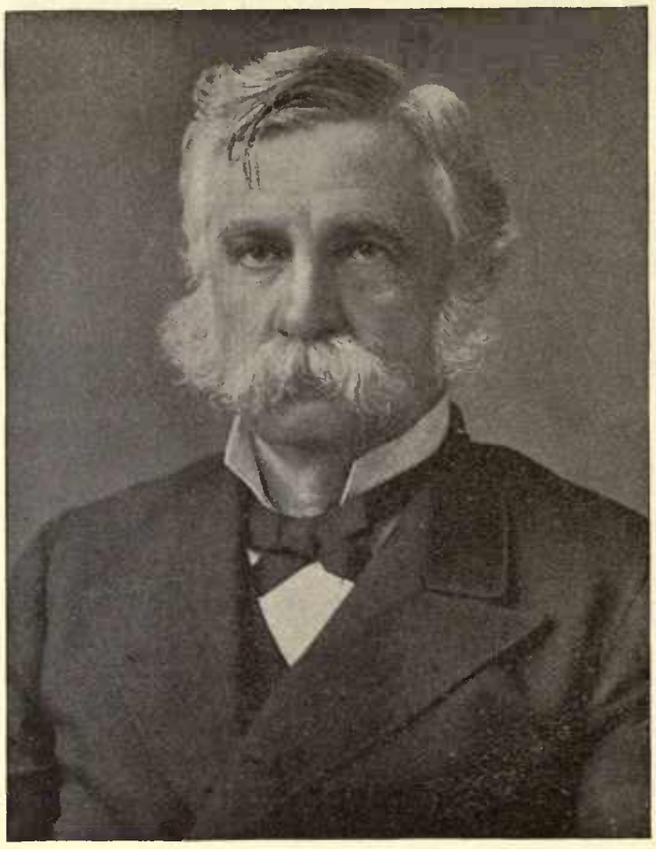
MAIN STREET, MILITARY DAY, LOOKING FROM TRINITY SQUARE, PAWTUCKET.

Photographed by Bebby.

John Devlin, assortment of quartz and stones.
Perry Oil Co., samples of lubricating oil, and Champion harness oil soap.
J. O. Draper & Co., mantel constructed of soap, and an exhibit of fancy soaps.
T. F. Clarke, case of cigars.
F. Q. Follett, exhibit of oil paintings.
Philip L. Webster, Peace Dale, names and mottoes made from wire.
Fred W. Dexter, jewelry, vases, silverware, and European novelties
Meiklejohn & Lomas, Miller, Briggs, Sterling, S. G. Chickering, Simpson & Brown pianos; Estey and Worcester organs.
Union Steam and Gas Pipe Co , New Standard steam heater, an Allen improved heater, and Spence hot water heater.
George A. Jencks & Co., furnaces and ranges.
Frank M. Borden, exhibit of different kinds of candy.
Fisk & Co., pharmacists' goods, perfumery, and fine confections.
Evening Tribune, printed souvenirs, magazines, and daily newspapers.
R. A. Butler, case of kid and morocco in different colors.
A. G. Hazard, assortment of fish lines.
Lorraine Manufacturing Co., display of Scotch zephyrs and fine woven goods.
D. Goff & Sons, case of Goff's braids.
David Harley & Co., fancy crockery, souvenir glass tumblers, and laces.
John Boyle & Co., candy booth.
Squire Z. Phinney, case of cigars.
Eagle Dye Works, exhibit of dyed cottons, and an American flag made of carded colored cotton.
Royal Weaving Co., fine dress goods.
New Idea Store, white muslins and fancy aprons.

In the evening the Garfield Club, of Pawtucket, gave a banquet at Music Hall, in honor of the one hundredth anniversary of the introduction of cotton spinning in America. Nearly every member of the club was present. Over the guests' tables on the stage was suspended the motto, "Welcome," and from the ceiling over the centre table a large bale of white cotton, draped artistically. Music was furnished by Hedly's National Band; the catering by Cooke, of Boston. The guests of the club were: Governor Morgan G. Bulkeley, of Connecticut; Adjutant-General Andrew Embler, Quartermaster-General William B. Reed, Surgeon-General Harry Hungerford, Paymaster-General Wallace B. Fenn, Commissary-General Eugene F. Boss, Aides-de-Camp Colonel William C. Skinner, General James Y. Fairman, Colonel Henry S. Redfield, Colonel William E. A. Bulkeley,

Assistant Adjutant-General George M. White and Assistant Quartermaster-General Henry C. Morgan; Lieutenant-Governor William H. Haile, of Massachusetts; Colonel George A. Keeler, Colonel William H. Dyer, Colonel E. V. Mitchell and Colonel S. M. Hedges; Colonel Milton H. French, of Maine; Hon. John C. Linehan, of New Hampshire; Hon. Charles Carleton



JOHN W. DAVIS,

GOVERNOR OF RHODE ISLAND.

Coffin, of Boston; ex-Governors Royal C. Taft and Henry Howard, ex-Lieutenant-Governor Daniel G. Littlefield, ex-Mayor George H. Grant, of Woonsocket, ex-Mayor A. K. Goodwin, Colonel I. L. Goff, Charles A. Lee, editor *Gazette and Chronicle;* F. H. Harcourt, of the *Evening Times;* Hon. Joshua Wilbour, Hon. Henry B. Metcalf, Benjamin F. Davis, Department Commander G. A. R.; Mr. H. A. L. Potter, Jr., Rev. J. J. Woolley, William M. P. Bowen.

President Tiepke presided, and speeches were made by Hon. Charles Carleton Coffin, who related some incidents in the life of General Garfield, Governor Bulkeley, of Connecticut, Lieutenant-Governor Haile, of Massachusetts, Colonel John C. Linehan, of New Hampshire, and ex-Governor Royal C. Taft, of Rhode Island. Letters of regret were read from Governor James A. Beane, of Pennsylvania, ex-Governor Herbert W. Ladd, of Rhode Island, and Governor David H. Goodell, of New Hampshire. After the formal speaking, an impromptu reception was held on the stage by the guests.

Prior to the arrival of Governor Bulkeley in Pawtucket, he, with his personal staff and the famous Foot Guard, of Hartford, which accompanied him, was given a reception at the Narragansett Hotel, Providence. The party was met at the depot by the staff of Governor Davis and escorted through the principal streets to the hotel. Adjutant-General Dyer, as the Governor's representative, entertained the party in the parlors, after which Governor Bulkeley and staff were driven to Pawtucket.

Military Day.

Tuesday was devoted to a grand display of the military organizations of the State, including the Grand Army and the Sons of Veterans, forming a military pageant unsurpassed in the history of the State. Very early in the inception of the arrangements for the celebration, the General Assembly had ordered the State Militia to Pawtucket during Centenary week. Invitations had been sent to organizations in other states, and the Grand Army of the Republic of Rhode Island decided to participate in the parade. New uniforms had been obtained for the militia, and there was sufficient rivalry between the organizations to ensure the success of the parade. Governor Bulkeley of Connecticut was accompanied by the Foot Guard of Hartford, Conn., a very historic and renowned organization. Its outfit, the same that has been worn for more than a century, is an exact copy of the uniform of the British Grenadier Guards, and the charter of the organization dates back to October 17, 1771. It acted as escort for Washington, Knox, Lafayette, Rochambeau, John Adams, Polk, Johnson and Grant, and for every governor of the state of Connecticut, as also for a long list of celebrations from the early part of the century.

The line was a long one, and necessarily some delay in starting resulted. The Governor's salute was fired at 10.30, and at 11.30 the procession moved and marched through the principal streets of Pawtucket. Guests from abroad packed the rooms of the Business Men's Association and the Mayor's rooms, and were escorted to the reviewing stand, whither approached at 1 o'clock Governors Davis and Bulkeley and their staffs. The ceremony of the review was very impressive and interesting, and the different companies received an ovation from friends and the assembled multitude as they passed the reviewing stand. The procession moved in the following order:

FIRST DIVISION.

Oliver H. Perry, Chief of Police of Pawtucket; Raymond H. Rathbun, High Sheriff of Providence, mounted.

Deputy Sheriffs Franklin B. Ham, Carlos L. Rogers, Charles E. Briggs and James McCabe.

Captain Rhodes and Sergeant Nickerson, Officers Tompkins, Reynolds, Hand, Arthur, Smith, Wilbur and McLaughlin, mounted.

Mounted Buglers Bancroft, of Company A, First Battalion Cavalry; Gardner, Company B, First Battalion of Cavalry; Wackerling, Battery A, Light Artillery; Brown, Battery A, Light Artillery.

GENERAL OLNEY ARNOLD, Chief Marshal.

Honorary Staff: Governor Alfred H. Littlefield, Lieutenant-Governor Daniel G. Littlefield, General William R. Walker, Colonel Stephen R. Bucklin, Judge-Advocate General Pardon E. Tillinghast, Surgeon-General James L. Wheaton, Colonel Oscar Lapham, General Horatio Rogers, Chaplain Joseph J. Woolley, Colonel Isaac M. Potter, Professor Alonzo Williams, Captain D Russell Brown, Captain W. B. Sears of Boston, Colonels Theodore A. Barton and James S. McCabe, General William Ames, General W. W. Douglas, Henry A. Stearns, Henry B. Metcalf, Colonel John McManus, Colonel Isaac L. Goff, George Edward Allen, Colonel Elias M. Jencks.

Aids to Chief Marshal: Colonel Alonzo E. Pierce, Colonel Almon K Goodwin, Colonel Robert McCloy, Major Eugene B. Crocker, Major James W. Larkin, Colonel Eben N. Littlefield, Major Stephen F. Fisk, Lieutenant Ferdinand Bray, Lieutenant George J. Fairbrother, Colonel William H. Gurney, Bernard T. Lennon and J. Milton Payne.

Marshals: Edward L. Freeman, Albert R. Sherman, John E. Thompson, Lyman M. Darling, Charles E. Longley, John S. Brazeau, John T. McGuire, James Linton, Edwin Darling, J. Osfield, Jr., Edward Smith, Arthur W. Stanley, Ansel D. Nickerson, George L. Walker, William P. Moroney, Charles A. Lee, Elisha W. Bucklin, Benjamin F. Smith, Benjamin G. Perkins, Henry M. Arnold, Philo E. Thayer, Jacob Shartenberg, Everett P. Carpenter, Daniel A. Jillson, Bernard McCabe, Edward McCaughey, John H. Coyle, Abraham Z. Falcon, Daniel S. Dexter, James Nisbet, James H. Mooney, Louis H. Beaudry and Charles Vaughan.

Assistant Marshals, Mounted: Charles O. Read, John S. Cottrell, James F. Barry, Bertrand J. Horton, Walter H. Stearns, Jesse M. Fairbrother, Lucius B. Darling, Jr., Frank Leonard, Henry H. Sager, Fred W. Allen, George M. Thornton.

On Foot: W. H. Park, F. Eugene Barker, David J. White, Fred. W. Easton, Charles E. Pervear, Charles R. Bucklin, Arthur H. Metcalf, S. Frank Dexter, Benjamin W. Gardner, Claude J. Farnsworth. George C. Newell, Herbert C. Darling, Henry L. Spencer, Charles L. Knight, Fred W. Dexter, Fred W. Allen.

In Carriages: Edward W. Blodgett, C. Fred Crawford, Philip C. Sheldon.

His Excellency Governor Davis, Commander-in-Chief.

Staff, Mounted: Adjutant-General Dyer, Assistant Adjutant-General Colonel H. C. White, Quartermaster-General Dennis, Assistant Quartermaster-General Walker, Surgeon-General Budlong, Assistant George H. Kenyon. Judge Advocate-General Charles A. Wilson, Assistant Walter R. Stiness, Aids-de-Camp Colonels Howard Smith, P. E. Hayes, William von Gottschalk. William J. Nichols, Vernon O. Taylor, Dalton E. Young.

Brigadier-General E. H. Rhodes, Commanding Brigade R. I. M.

Staff: Assistant Adjutant-General Philip S. Chase, Assistant Inspector-General William J. Bradford, Q. M. Captain John J. Jenckes, Engineer Captain John Howe, Provost Marshal Captain B. McSoley, Signal Officer Captain Charles R ittmann, Aides-de-Camp Captain John F. Clark, Captain Fred B. Burt.

Signal Corps, R. I. M., Sergeant John S. Gill: 5 men.

National Band, T. W. Hedly, leader; 35 men.

Second Regiment Infantry, R. I. M , 325 men, companies equalized; Colonel James Moran commanding.

Staff: Lieutenant-Colonel J. H. McGann, Major William McPherson, Adjutant T. F. Dwyer, Quartermaster J. E. Downey, Surgeon J. A. O'Keefe, Commissary Thomas Brady, Paymaster Frank Canning, Chaplain T. F. Doran.

Company E, Captain Bernard Hackett, Lieutenants John Kelly and John J. Kinion.

Company H, Captain Peter Sweeney, Lieutenants John Gates, John Hennessey.

Company B, Captain John McCrudden, Lieutenant D G. Roche.

Company F, Captain Thomas Donahue.

Company D, Lieutenants Frank M. Lally and John J. Lee.

Company G, Captain Joseph E. Burns, Lieutenants C. F. O'Connor and Peter R. O'Reilly.

Company A, Captain Richard R. Howland and Lieutenant John E. Conley.

American Band, D. W. Reeves, leader; 40 pieces.

First Regiment Infantry, R. I. M., 320 men, companies equalized, Colonel W. H. Thornton commanding.

Major Hiram Kendall, Adjutant A. V. Warfield, Surgeon George A. Brug, Quartermaster Hezekiah Martin, Paymaster John A. Carter, Commissary Thomas S. Delano, Chaplain Rev. Thomas H. Cocroft, Assistant Surgeon Fred T. Rogers.

Company D, Captain Edwin Draper, Lieutenants John J. Mayberry and R. L. Coleman.

Company B Captain Harry Rose, Lieutenants Albert S. Higgins and Herbert S. Tanner.

Company C, Captain Albert F. Brown, Lieutenants Daniel J. Sully, George C. Arnold.

Company E, Captain Everett E. Whipple, Lieutenants J. Irving Maxson and A. C. Thompson.

Company H, Captain Giles W. Easterbrooks, Lieutenants William McGregor and Charles E. Gardiner.

Company A, Lieutenants George L. Butts and A. C. Brown.

Company F, Captain George W. Norman, Lieutenants C. H. Ledward and Walter N. Kinney.

Company G, Captain George A. Forsyth, Lieutenant H. E. Williams.

Martland's Fifth Regimental Band, Brockton, Mace Gay, leader, 25 pieces.

Company I, Fifth Regiment Infantry, M. V. M., Captain Will H. Goff, Lieutenants H. A. Clark and O. P. Richardson, 60 men.

Second Brigade Massachusetts Signal Corps, Boston, Lieutenant C. Merton Healey, 25 men.

Drum Corps.

GEN. OLNEY ARNOLD,

CHIEF MARSHAL, CENTENNIAL WEEK.

First Separate Company, Infantry, R. I. M., Captain Robert W. Blount, Lieutenants Elza A. Rollins and F. S. Bowen, 35 men.

Second Separate Company, Infantry, Lieutenants C. H. Wright and R. B. Minton, 30 men.

Machine Gun Battery, Lieutenant William Ely, 20 men.

Battery A, Light Artillery, R. I. M., Captain Andrew Gray, Lieutenants Edgar R. Barker, Charles H. Weaver and Charles A. Town, 75 men.

First Battalion Cavalry, R I. M.

COL. WM. H. GURNEY,

CHIEF MARSHAL SECRET AND CIVIC SOCIETIES PROCESSION.

Major Alexander Strauss, Adjutant Thomas Child, Surgeon Cha les Hayes. Quartermaster George S. Tingley, Commissary Ferdinand Bray, Chaplain Rev. Joseph J. Woolley.

Company A, Captain Edward T. Jones, Lieutenants James and Charles Allerson. 38 men.

Company B, Lieutenants William A. Maynard and Fred E. Page.

Honorable staff of the Roxbury Horse Guards.

Roxbury Horse Guards. Troop D, First Cavalry, M. V. M., Captain David F. Henderson, Lieutenants S. B. King, G. F. Henderson, 150 men.

SECOND DIVISION.

Provisional Brigade of Rhode Island Militia, under command of Colonel Cyrus M Van Slyck, mounted.

Staff: Lieutenant John G. Wood, Acting Assistant Adjutant-General; Major William J. McCaw. Lieutenant-Colonel McLeod, Lieutenant Stacey, mounted, and Colonel George A. Keeler, Assistant Inspector-General of Massachusetts, as guest on staff.

Newport Band, J. W. Gash, leader, 22 pieces.

Newport Artillery, Colonel Jere W. Horton, commanding.

Staff: Surgeon C. F. Baker, Assistant Surgeon C. M. Cole, Paymaster E. D. T. Bosworth, Assistant Paymaster J. H. Martin, Assistant Commissary George W. Tilley and ex-Colonel George H. Vaughan.

First Company, in command of Lieutenant-Colonel Brown, 20 muskets.

Second Company, in command of Captain George Tilley, 20 muskets.

Third Company, in command of Quartermaster H. C. Stevens, Jr., 20 muskets.

Fourth Company, in command of Major George C. Shaw, 20 muskets.

United Train of Artillery, Lieutenant-Colonel E. C. Danforth in command: Paymaster, Lieutenant W. E. Cates; Quartermaster, Lieutenant F. M. Danforth; Assistant Surgeon, Lieutenant J. F. Haller; Assistant Quartermaster, Lieutenant W E. Burbank; Commissary, Lieutenant W. R. Wattles; Assistant Paymaster, Lieutenant C. A. Vars; Assistant Commissary, Lieutenant C W. Pierce.

Company A, Captain Sumner B. Hunt, Lieutenant Smithers, 40 muskets.

Company B, Captain George E. Colman, Lieutenant W. E. Angell, 36 muskets.

Cambridge City Guards, Cambridge, Mass., Captain Richard W. Sutton, Lieutenant F. H. Griffin, 50 muskets.

Pawtucket City Band, William Linton, leader, 24 pieces.

Kentish Guards, Colonel W. E. Brown, Lieutenant J. McLeod, Major L. W. Fiske, Captain H. B. Tisdale, 2 musicians and 40 muskets.

Bristol Train of Artillery, Captain Frank Nichols, Lieutenant Andrew Briggs, 32 muskets.

Woonsocket Continental Band, Thomas P. Mowry, leader, 20 pieces.

First Light Infantry Veteran Association, Colonel F. F. Olney commanding, Lieutenant-Colonel Christopher Duckworth, Major James R. Dorrance.

Staff: Acting Adjutant William H. Silloway, Quartermaster Thomas R. Bradford, Jr., Com. M. W. Lonergan, Clerk W. W. Burnham.

Color Guard, F. L. I. Veteran Association, consisting of four actives in full infantry uniform, Assistant Quartermaster Wm. R. Arnold, Commissary Sergeant John W. Armstrong, Color Sergeants Henry Barney and J. E. Reavey.

F. L. I. Veterans, 60 in number, as one company, Captain J. W. Comstock, Lieutenants S. A. W. Trafford, Geo. Hutchins, Frank E Lovell.

THIRD DIVISION.

Colt's American Band, of Hartford; 26 pieces.

His Excellency Morgan G. Bulkeley, Governor of Connecticut, and full staff, mounted. Adjutant-General A. H. Embler, Adjutant-General Elisha Dyer, Assistant Adjutant-General George M. White, Quartermaster-General William B. Rudolph, Paymaster-General Walter T. Fenn, Colonels William C. Skinner, William E. A. Bulkeley, and Henry S. Redford.

First Company Governor's Foot Guard, of Hartford, as escort to Governor Bulkeley, Major John C. Kinney, mounted, commanding.

Staff: C. C. Strong, Paymaster; L. T. Fenn, Quartermaster; S. P. Cooley, Commissary; E. H. Hyde, Jr., Judge Advocate; M. M. Johnson, Surgeon; W. A. M. Wainwright, Assistant Surgeon; Rev. J. W. Bradin, Chaplain; George H. Folts, Engineer; J. J. Poole, inspector of Target Practice; Atwood Collins, Ordnance Officer; E. A. Stedman, Adjutant; A. W. Rood, Signal Officer.

Non-Commissioned Staff: L. N. Hillman, Sergeant-Major; Edson Sessions, Quartermaster-Sergeant; T. R Shannon, Hospital Stewart; L. M. Prouty, Ordnance Sergeant; T. H Goodrich, Signal Sergeant; W. T. Main, Color Sergeant; R. W. Williamson, Color Sergeant.

Foot Guard, parading as a battalion of four companies, Captain James C. Pratt, Lieutenants Henry Bryant, Fayette C. Clark, G. J. A. Naedele, William S. Dwyer. Ensign Albert C. Bill; 94 men.

Carriages containing officials of the cities of Pawtucket, Providence, etc , and of Rhode Island and other states.

No. 1.— Lieutenant Governor Wardwell, Bristol; Secretary of State McGuinness, His Honor Mayor Carroll.

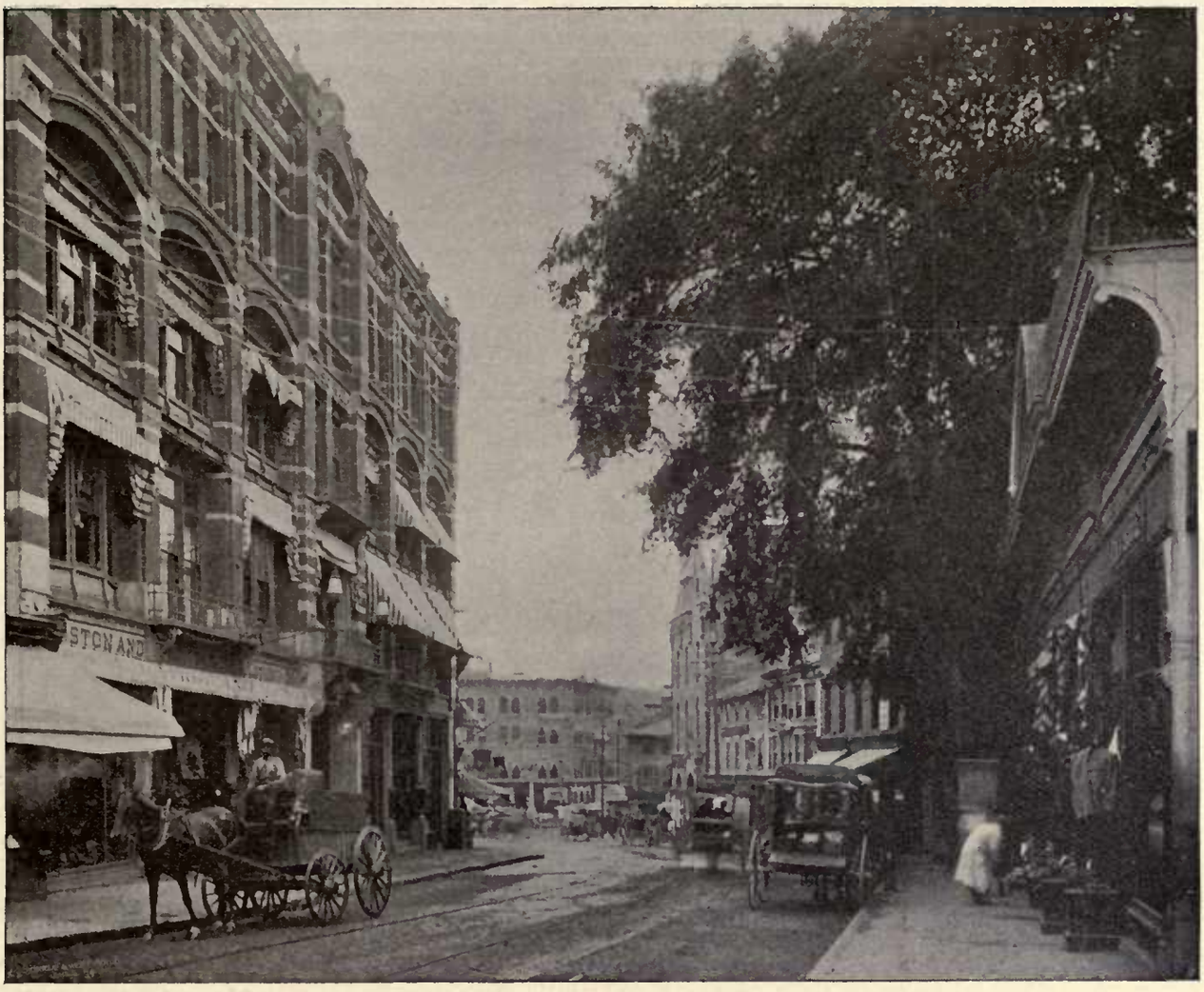
No. 2 — Lieutenant-Governor Haile, of Massachusetts; Colonel W. H. Dyer, of Boston; and Chairman Tiepke, of the celebration Committee.

No. 3. Colonel French, of staff Governor of Maine; Colonel J. C. Linehan staff Governor of New Hampshire; Quarter-Master General Charles R. Dennis, of Rhode Island.

No. 4.— Colonel S M. Hedges, and Colonel G. A. Keeler, of staff of Governor of Massachusetts; and General John C. Budlong.

OLIVER H. PERRY,

CHIEF OF POLICE, PAWTUCKET.



LOOKING DOWN MAIN STREET, PAWTUCKET.

Photographed by Baker.

No. 5.— Senator N. F. Dixon; Congressman C. H. Grosvenor, of Ohio; Congressman W. F. Wilcox, Connecticut.

No. 6 — Colonel A. C. Mendenhall, U. S. A., Newport; Captain Thompson, U. S. A., Providence; Colonel Walter R. Stiness, Providence.

No. 7. — Honorable Thomas Durfee, Chief Justice, Rhode Island; and Justices Stiness and Tillinghast.

No. 8 — Rt. Rev. Bishop Clark, President Andrews, of Brown University; Rev. Edward Everett Hale, D. D., of Boston; Rev. E. O. Bartlett.

No. 9.— Honorable H. W. Ladd, Honorable George P. Wetmore, Honorable A. H. Littlefield.

No 10.— Honorable Wm. Sprague, Canonchet; Honorable H. Howard, Coventry; Honorable R. C. Taft, Providence.

No. 11.— Mayors Coggeshall, Newport; Pond, Woonsocket; Barker, Providence.

No 12. — Mayors E. S. Bradford, of Springfield; Stillman Humphrey, H. F. Peck, of New Haven; Asa T. Newhall, of Lynn.

No. 13.— Captain A. H. Russell, U. S. A.; Lieutenant Douglass Howard, U. S. A.; Colonel Kenyon.

No. 14.— Vice Commander Tobin, G. A. R.; Rev. Chauncey Leonard; Adjutant-General Edward F. Prentiss.

No. 15.— Honorable Charles Carleton Coffin, H. N. Slater and W. A. Slater.

No. 16.— Honorable L. W. Ballou, Honorable W. A. Pirce, Honorable C. H. Page, Honorable B. T. Eames.

No. 17.— Ex-Lieutenant Governors Fay and Littlefield.

No. 18.— Honorable Enos Lapham, Honorable Oscar Rathbun, Speaker A. J. Miller, Mayor J. F. Sullivan, Holyoke, Mass.

No 19.— Postmasters N. D. Sperry, Charles H. George, Isaac R. Wilkinson.

No. 20.— Ex-Mayors Sayles and Hayward, Honorable George H. Grant, Honorable R. S. Franklin.

No. 21.— Aldermen Nathan A. Chatterton, George A. Saunders, William F. Meagher, Joseph E. Jenckes.

No. 22.— Councilmen O'Reilly, B. Lennon, White and Thayer.

No. 23 — Councilmen McKeough, Peter Lennon, Sheldon and Moore.

No. 24.— Councilmen Halliday, Brown, Watson and Winters.

Other carriages, in addition to those officially numbered, were in the line, and contained a number of prominent citizens of Pawtucket and Providence.

FOURTH DIVISION.

Grand Army of the Republic.

Department colors, with an escort of one comrade from each Post.

Benjamin F. Davis, Commander Department of Rhode Island, G. A. R.

Aides.— Chief of Staff Samuel B. Hyndman, Thomas D. Rice, C. J Carvell, William Davenport, John McCausland, S. C. Moulton, Henry M. Howe, Ansel L. Sweet, Dr. C. O. Ballou, D. S. Ray, A. Fry, G. B. Willis, A. B. Pressey, George M. Turner, Samuel W. K. Allen, Past Department Commanders Charles R. Brayton, Benj. L. Hall, Charles H. Williams, Charles C. G ay, E. C Pomroy, J Costine; Staff Department Commander, George A. Woolley, William P. Perry, Harry W. Sisson, S. P. Spinning, J Harry Welch, E. K. Ellis, John A. Vaughn, Dr. T. T. Graves, J. H Rickard, H. A Silvey, Murdock C. McKenzie, George H. Pettis; Senior Vice Department Commander, Benjamin H. Childs.

Glenwood Band, of Taunton, William F. Lovisey, leader; 26 pieces.

Prescott Post, No. 1, Providence, William A. Spicer, Commander; 75 comrades.

Valley Falls Continental Band, Frank Walker, leader; 16 pieces.

Ballou Post, No. 3, Central Falls Theodore F. Dexter, Commander; 125 comrades, with banner supported by Arthur Ward and Bertie Bowen, as soldier and sailor.

First Regiment Drum, Fife and Bugle Corps, Massachusetts Volunteer Militia, John E. Campbell, Drum Major; 25 pieces.

Fletcher Webster Post, No. 13, Department of Massachusetts, of Brockton, James W. Brown, Commander; 75 comrades—guests of Ballou Post, No. 3.

Fred E. Davis Drum Corps, Providence, Otis Manchester, leader; 2 pieces.

Arnold Post No. 4, Providence, Nelson H. Arnold, Commander, 75 comrades.

Charles E. Lawton Post, No. 5, Newport, Overton Langley, Commander; 50 comrades.

Reno Post, No. 6, East Greenwich, Augustus S. Paine, Commander; 24 comrades.

Farragut Post, No. 8, Riverside, Isaac H. Rogers, Commander, 15 comrades.

Social Brass Band, of Woonsocket, Henry Dural, leader, 18 pieces.

Smith Post, No. 9, Woonsocket, Thomas A. Buell, Commander, 40 comrades.

Parks' Continental Fife and Drum Band, William A. Parks, leader, 6 pieces.

Slocum Post, No. 10, Providence, William E. Stone, Commander; 180 comrades.

Thomas Post, No. 11, Apponaug, Robert M. Pollard, Commander, 24 comrades.

Ives Post Drum Corps, Providence, Ezek Freeman, leader; 8 pieces.

Ives Post, No. 13, Providence, John A. Jenkins, Commander, 40 comrades.

McGregor Post Band, Phenix, John H. Tennant, leader; 5 pieces.

McGregor Post, No. 14, Phenix, James Corcoran, Commander; 50 comrades.

Bristol Fife and Drum Band, Elnathan P. Brownell, Jr., leader; 10 pieces.

Babbitt Post, No. 15, Bristol, Herbert F. Bennett, Commander; 50 comrades.

Union Cornet Band, of Quidnick.

Bucklin Post, No. 20, East Providence, Orland Freeborn, leader; 75 comrades, accompanied by the Starboard Watch.

Lincoln Post, No. 22, Hope Valley, Elisha P. Clarke, Commander; 20 comrades.

Pawtucket City Band, William H. Christian, leader, 26 pieces.

Tower Post, No. 17, Pawtucket, Joseph F. Means, Commander; 130 comrades.

Spary's Military Band, Taunton, William C. Spary, leader; 24 pieces.

William H. Bartlett Post, No. 3. Department of Massachusetts, Taunton, Alden H. Blake, Commander; 150 comrades.

Naval Veterans. Commodore William S. Wells commanding.

Farragut Association of Naval Veterans, port of Providence; 40 shipmates; William H. Place, commanding.

Sons of Veterans.

The Continental Band, Providence, G. A. Stone, leader; 25 pieces.

Color Bearer.

Colonel T. A. Barton and Staff.

Aids to Staff.

General A. G. Lawrence Camp, No. 3, of Newport, Lieutenant F. J. James; 12 men.

General A. E. Burnside Camp, of Providence; Captain W. P. Hawkes, First Lieutenant Clinton, Second Lieutenant Lindsey; 48 men.

Camp James F. DeWolf, No. 8, Bristol, Captain Gorham; 16 men

Camp A. K. Tilton Drum Corps, A. H. Edgar, leader; 10 pieces.

Camp A. K. Tilton, No. 9, Pawtucket, Captain J. E. Mason; 32 men.

Camp C. F. Gordon, No. 10, Woonsocket, Captain W. S. Preston; 16 men.

Camp General James A. Garfield, No. 11, Providence, Captain James Warren, Jr.; 30 men.

Camp General George G. Meade, No. 12, East Providence, Lieutenant A. O. Chipman; 25 men.

Camp F E. Davis, No. 13, Providence, Captain M. R. Towne; 24 men and drum corps.

Roger Williams Drum Corps, F. Lynch, leader.

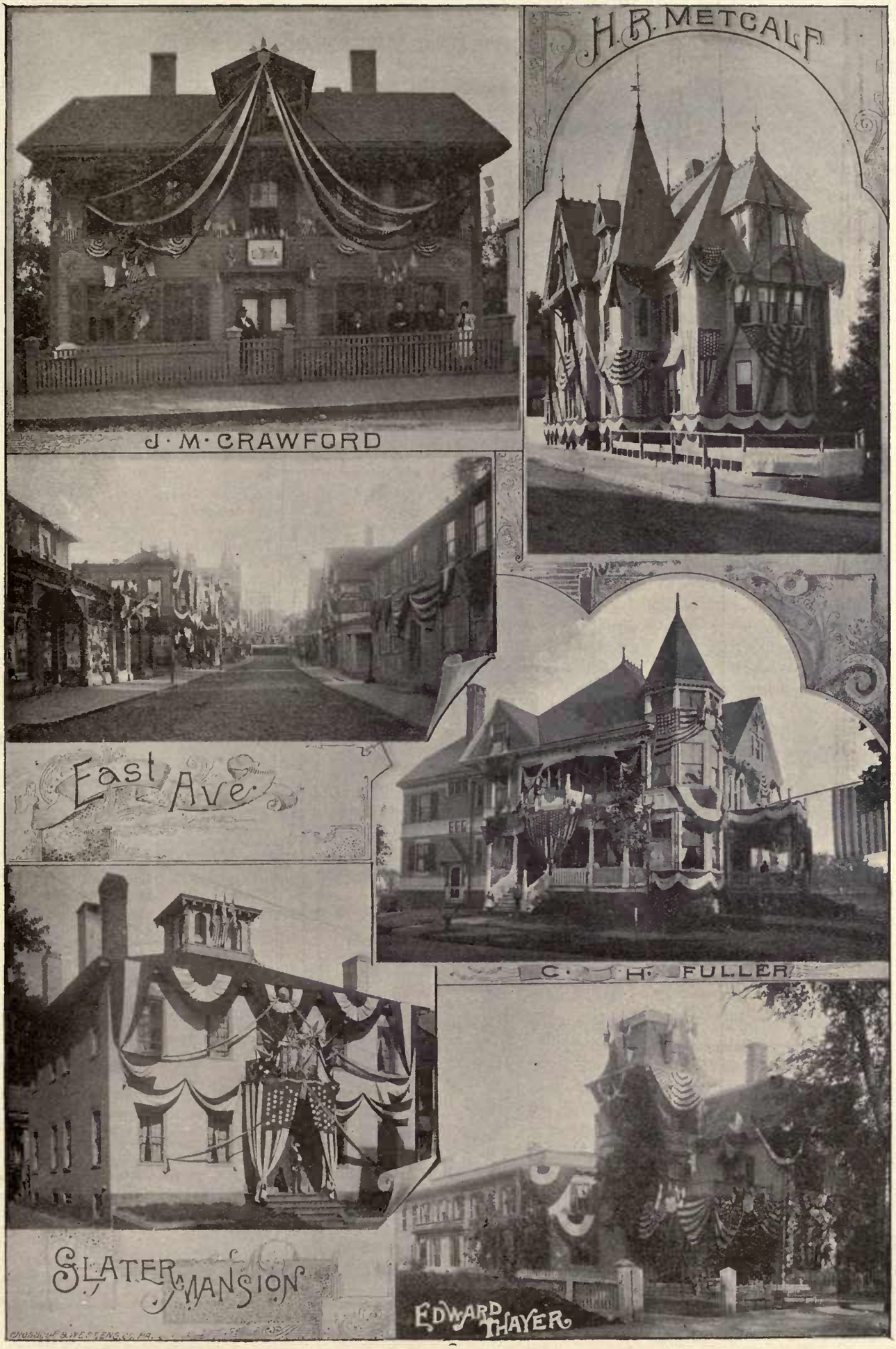
Camp I. P. Rodman, Wakefield, No. 15, Captain S. H. Donahue; 24 men.

Camp Thomas Moies, No. 14, Central Falls, Captain John F. Clark, 32 men.

After the line was dismissed, dinner was served in tents on Dexter Street, whither the different organizations were escorted. Four acres of ground were covered by the tents, and it is estimated that over 4,000 people were fed.

In the evening the tents on Dexter Street were taken possession of by the Rhode Island Grand Army of the Republic, and a camp fire was held in which the Veterans, the Sons of Veterans and a large number of invited guests participated. Plates had been laid for 2,000 persons, and after the different organizations had taken the places assigned to them, there was little room to spare. The fare was simple—consisting principally of baked beans, bread and coffee. Reeves' American Band of Providence furnished music during the supper and at intervals through the evening. Department Commander Benjamin F. Davis presided, and speeches were made by Mayor Hugh J. Carroll, Lieutenant Governor Haile of Massachusetts, Governor Davis of Rhode Island, Chief Marshal General Olney Arnold, Nathan Appleton of Post 113, Massachusetts, John C. Linehan, Senior Vice Commander of New Hampshire, General Elisha H. Rhodes, Councilman B. T. Lennon, Commodore Wells, Commander Albert E. Sholes, of Georgia, Chaplain Leonard and Councilman Tiepke. Past Department Commander B. L. Hall recited several selections, the whole assembly joined in singing "Marching Through Georgia" and other patriotic selections, and the camp fire broke up by singing "Auld Lang Syne."

Among the distinguished guests present, apart from the speakers, were the following: Henry B. Metcalf, Colonel E. O. Bartlett, ex-Lieutenant Governor Daniel G. Littlefield, ex-Governor Alfred H. Littlefield, W. H. Park, ex-Mayor Goodwin of Pawtucket, George A. Mumford of Pawtucket, R. D. Mason of Pawtucket, Captain Joshua Lothrop, A. H. Blake, William R. Sayles, Captain Charles Rittmann, Major Alexander Strauss, Captain G. W. Easterbrooks, ex-Mayor Sayles of Pawtucket, George P. Grant, G. J. Fairbrother, Judge Isaac Shove of Pawtucket, City Clerk Alden Sibley of Pawtucket, Major E. B. Crocker, Colonel Sans Souci, Colonel T. A. Barton, Dr. George H. Kenyon, Nathan B. Lewis, Rev. Chauncey Leonard, Chaplain; B. H. Child of Providence, Senior Vice Commander; George M. Turner, Junior Vice Commander; D. S. Ray, Assistant Quartermaster General; Ansel D. Nickerson, Charles A. Lee, Christopher Duckworth, Rev. W. Halligan, Colonel S. M. Hedges of Governor Brackett's staff, Major F. W. Appleton of Boston; Rev. J. J. Woolley, Rev. J. A. Hurley, Rev. E. H. Porter, Rev. M. Fitzgerald, Rev. H. F. Kinnerney, Rev. Edwin Bromley, Rev. P. M. Vinton, Rev. Geo. Bullen, Rev. W. P. Tucker, Rev. Benjamin Eastwood, W. W. Blodgett, Henry Fletcher, General W. R. Walker, James Linton, W. P. Moroney, J. S. Read, Superintendent of Lights, of Pawtucket;



"THE DECORATIONS WERE PROFUSE."

J. MILTON PAYNE,

CHIEF MARSHAL TRADES PROCESSION.

W. P. Allen, Highway Commissioner, of Pawtucket; W. M. Peckham, Overseer of Poor; Chief of Fire Department John Brierly of Pawtucket, Captain of Police E.T. Rhodes of Pawtucket, Chief of Police Perry of Pawtucket, T. P. Barnefield, D. L. Wilkinson, F. W. Easton, Lewis Fairbrother; Gideon Spencer, Past Department Commander; C. C. Gray, Past Department Commander; B. L. Hall, Past Department Commander; Colonel Nathan D. Pierce, Jr., of Warwick; A. K. McMahon, Past Department Commander; F. A. Arnold, Past Department Commander, Colonel C. H. Williams, of Providence, George W. Newell, E. S. Binford, C. H. Bullock, F. E. Drown, F. Eugene Barker, Dr. G. H. Stanley, J. F. Abbott, E. L. Freeman, C. Fred Crawford, S. F. Dexter, Dr. J. L. Wheaton, Captain F. M. Bates, David J. White, Councilmen White, McKeough, Winters, Lennon, Sheldon, O'Reilly, Larkin, Halliday, Thayer, Moore, Brown and Watson of Pawtucket; Aldermen Saunders, Chatterton, Jenckes, Meagher and Smith of Pawtucket; Charles R. Bucklin.

TRADES DAY.

The third day of the celebration was devoted to a procession of the tradesmen of Pawtucket and vicinity, followed by a parade of the secret and civic societies in the afternoon. The business men took the opportunity to make their finest display, and the result showed it to be one of the most prominent features of the week. Early in the day the wagons began to arrive, keeping the marshal and his assistants busy assigning them to their respective positions. The line started at 10:15 a. m., from Mineral Spring Park, where the right of the line had rested, and arrived at the reviewing stand at 11.15, where General Olney Arnold, the chief marshal for the week, was stationed. Among the guests on the reviewing stand were Mayor Peck and Judge Pickett of New Haven, Conn., Alderman Mahl of Hartford, and James Dempsey of Lewiston, Me. The route of march was through Main, School, Prospect, Pond, Summit, Cottage, Allen Avenue, Broadway, Main, North Main, Exchange, High, Barton, Broad, Miller, High, Exchange, Broad, Main, East Avenue, Pawtucket Avenue, Grace, Pine, Brown, West Avenue to Main Street, where the line was dismissed. The formation of the line was as follows:

Chief of Police Perry and Deputy Sheriff Briggs, mounted.

Police Captain Rhodes and Sergeant Nickerson, mounted.

Platoon of mounted police, Arthur, Smith, Reynolds, Hand, Connell and McLoughlin, under command of Tompkins.

Chief Marshal J. Milton Payne.

Chief of Staff Edgar K. Gridley.

Staff: Byron C. Payne, James M. Bishop, George B. Olney, William Allenson, George M. Thornley, Thomas M. Sweetland, F. E. Tingley, H. F. Lull, John S. Cottrell, George O. Capron, Charles L. Abbott, Arthur G. Wightman, E. P. Carpenter, R. H. Kirk, D. A Jillson, J. Shartenberg, L B. Darling, Jr., Herbert Darling, Bertram Horton, E.B. Crocker, John F. Coyle, Jude Payne.

FIRST DIVISION.

Reeves' American Band, D. W. Reeves, leader; 35 pieces.

Marshal, DAVID HARLEY.

Aids, J. Shartenberg, E. J. Goward.

Exhibits by the following business houses: Providence Clothing Co., The J. B. Barnaby Co., Edward C. Almy & Co., Misfit Clothing Parlors, Jerome Kennedy & Co., Radikin, Cooney & Forbes, F. W. Westcott, New Idea Store, David Harley & Co., Lynd & Murphy, George C. Peck, Leo J. Schletzer & Co., Pawtucket Hair Cloth Co., City Coal Co., J. F. Riley, T. Culpan, J. T. Cottrell, Olney & Payne Bros., L. F. Tingley, M. Greenan, N. T. Cottelle, William A. Atwell, City Sealer, W. F. & F. C. Sayles, Geo. E. Newell, Whittaker & Smith, John W. Perry, C. E. Thurber, Pawtucket Warehouses, City Laundry, Troy Steam and Rhode Island Laundries, N. Bates & Son. Union Pacific Tea Co., W. W. Morgan, Henry C. McDuff.

SECOND DIVISION.

Marshal, G. H. SPAULDING. (Mounted.)

Aids, (mounted), W. W. Spaulding, John Dana, William Lee, William Carpenter, Daniel Brayton, John Devlin, Edward Gurry and Hector Schiller.

Exhibit by M. Steinert & Sons, Providence,

BUTCHERS' AND MARKETMEN'S ASSOCIATION.

J. F. Abbott, marshal; Thomas J. Lodge, aid.

Diminutive butchers and marketmen: Arthur Whitney, C. Vaughan, Charles Carpenter and R. Vaughan.

Knights in white tunics, carrying cleaver and steel. Their names are: Edward Ryan, of Lonsdale; Lewis Briggs, Chicago Beef Company, Pawtucket: Owen McNamara, David Morrison, George Graham, of Pawtucket; F. F. Robbins, A. D. Ross & Co., Pawtucket; H. J. Campbell, C. A. Campbell, with his two sons, Ossy and George S.; F. A. Abbott, Pawtucket; Hugh J. Clark, Pawtucket; Albert Havens, Pawtucket; Joseph Biddewell, Pawtucket; J. R. Williams, Pawtucket; W. O. Phinney, Pawtucket; John Henry, Pawtucket; John D. Cox, Pawtucket and Providence; H. F. Horton.

MOUNTED BUTCHERS AND MARKETMEN.

J. F. Bannon, Marshal, Joseph Tetro, Peter White, Walter G. Goodale, A. Putnam, Calef & Co., Lonsdale: L. W. Sweet, Pawtucket; C. F. Spaulding, Central Falls; Henry Cottrell, E. D. Horton, Thomas E. Mooney, Pawtucket.

Delegation of Butchers' and Marketmen's Association of Rhode Island in carriages. President, H. K. Clark; Secretary, C. E. Harris; Treasurer, Edwin Tetlow; Chief Marshal, Charles A. Carpenter; Executive Board, Samuel Whitely, Chairman; George Calef, H. A. Sayles and Sidney F. Adams.

Exhibits by the following business houses: George W. Edmunds, H. S. Johnson, Emerson Bros., O. Miclette, J. H. Tingley, Dexter Asylum, of Providence, Bowen Bros., Horace Z. Baker, Seekonk Ice Co., Dispeau, Russell & Co, W. R. Dennis of Seekonk, Deahy Bros., Dawson & Co.,

THIRD DIVISION.

Marshal, TIMOTHY BUTLER.

Aids, Edward and Daniel Donovan.

Exhibits by the following business houses: Standard Bottling Co., Timothy Butler, What Cheer Brewery, Champion Soap Co., Isaac L. Goff, Dr. Hough's Medical Preparations, Wheeler and Wilson S. M. Co., Home Bleachery & Dye Works, Fred H. White, Perry Oil Co., Combination Ladder Co., George L. Walker & Co., George L. Chaflin & Co., Chambers, Calder & Co., F. F. Follett & Co., Charles Kern, J. D. Billington, O. H. Jillson, Franklin Dye House, J. O. Draper & Co, John D. Lewis & Co., Blanding & Blanding, United States Express Co., C. E. Thurber, F. Whelden, Central Falls Furniture Co, F. N. Adams & Son, Pawtucket Baking Co., F. A. Kennedy & Co., F. P. Steere.

FOURTH DIVISION.

Marshal, HORATIO A. BROWN.

Aids, Ferdinand Bray, George S. Tingley, Charles and James Allenson.

Exhibits by the following business houses: Carpenter & Co., Flint & Co., A. F. & F. Bray, John M. Dean & Co., Union Furniture Co., Bernard McCaughey & Co., New England Grocery & Tea Co., Atlantic Compressed Yeast Co., Thomas J. Leonard, Fleischmann & Co., Pawtucket Furniture Co., E. H. Smith, Pawtucket Baking Co.. Henry L. Spencer, Wightman Bros., Woodlawn Co-operative Society, Peter Lennon, Francis Duffy, E. W. Shippee, Kennedy, Gough & Murray, F. W. Marlin & Co.

Chief Marshal, WILLIAM H. GURNEY.

Staff—R. A. Barber, chief; aids, H. H. Sager, Willis C. Baker, Daniel Livingston, G. D. Wilson, Joseph Holland, John McGrath, Patrick Murphy, H. N. French, James P. Brady, Austin Beaudreau, Michael Nolan, William E. Burbank.

Honorary Staff—Daniel A. Jillson, J. Osfield, Jr., John E. Thompson, Captain Charles Rittmann, Major Alexander Strauss, Charles H. Fuller, J. E. V. Matthieu, Thomas M. Sweetland, George J. Fairbrother, John Coyle, John Cockcroft, John F. Riley.

FIRST DIVISION.

Marshal, HERBERT O. TRUE.

First Regiment, Patriarchs Militant, I. O. O. F., Colonel E. A. Bezely, commander.

Staff and Non-Commissioned Staff — Gen. Carpenter of the Fourth Brigade, Mass., P. M., I. O. O. F. and Staff.

Grand Canton William S. Johnson, Providence, Captain Lindsay Anderson; 40 members.

Canton Attleboro, 48, Captain W. E. Cook; 30 members.

Canton Providence, Captain C. A. Brown; 15 members.

Canton Pawtucket, Captain H. M. Curtis; 25 men.

Canton Sowamset, Warren, Captain D. W. Gladding; 35 members.

THE RIVER NORTH OF DIVISION STREET BRIDGE, PAWTUCKET.

SECRET AND CIVIC SOCIETIES.

The line of Societies which participated in the afternoon parade was ready to move shortly after 2.30 P. M., the hour announced. The route was similar to that traversed by the trades procession in the morning. No greater contrast could be imagined than was seen in the procession of yesterday, with its gay plumes and habiliments of war, and this of the societies of brotherly love and peace. All nationalities were represented and it was a spectacle which will long be remembered. The line was formed as follows:

Platoon of police, mounted, under command of officer Tompkins.

Reeves' American Band, D W. Reeves leader, 35 musicians.

Canton Cohannet, 69, Taunton, Captain J. W. Strange; 30 members.

Enterprise Lodge, No. 22, I. O. O. F., Noble Grand Louis C. Butler; 48 men.

Superior Lodge, No. 35, Central Falls, N. G. George H. Perkins; 40 men.

SECOND DIVISION.

Marshal, H. G. DUBY.

Aid, David Fraser.

Scottish Clans, A. Fullerton, Marshal; W. Ferguson and R. Knox, aids.

W. C. Purdie, D. McLean, D. McCaffrey and W. Jeffrey, pipers, Boston.

Royal Grand Officers of Rhode Island and Massachusetts.

Boston Caledonian Club; 50 clansmen.

Clan McKenzie, Boston; 30 clansmen.

Clan McGregor, Quincy, Mass.; 40 clansmen.

Clan Mackintosh, Cambridge, Mass.; 12 clansmen.

Clan Cameron, East Boston; 15 clansmen.

Clan Campbell, Chelsea, Mass.; 15 clansmen.

Clan McKinnon, Woburn, Mass.; 20 clansmen.

Clan Farquharson, South Boston; 30 clansmen.

Clan Stewart, Somerville, Mass.; 20 clansmen.

Clan Fraser, Pawtucket; 50 clansmen.

Pawtucket City Band, W. Christian, leader; 24 pieces.
Temple of Honor: Grand Templar Robinson, Grand Record Johnson, Grand Vice Templar Thayer, Grand Treasurer Sherman, Past Grand Templars Davis, Carter, Lassell, Smith.
Nonpareil Temple, Pawtucket; 40 men.
Twilight Temple, Central Falls; 40 men.
The Continental Band, Providence, W. A. King, leader; 8 pieces.
Order of United American Mechanics.
Narragansett Council, No. 2, Providence; 60 men.
Hope Council, No. 1, Westerly; 12 men.
Ironside Council, No. 4, Pawtucket; 50 men.

THIRD DIVISION.

Marshal, LAWRENCE HAYES.

Aids, G. B. Sunderland, Joseph E. Holland.

Conant Thread Company Brass Band, J. McNiff, leader; 27 pieces.
Uniform Rank, Sir Knights Sons of St. George, of Fall River, Mass.; with staff.
Samuel Slater, No. 185, of Pawtucket; 100 persons.
Brittania Lodge, No. 196, of Lonsdale; 150 members.
Peabody Lodge, No. 184, of Olneyville; 75 men.
Mayflower Lodge, No. 209, of Wanskuck; 12 members.
Edward Harris Lodge, No. 183, of Woonsocket; 70 members.
Beaconsfield Lodge, No. 186, of Providence; 100 members.
William Blackstone Lodge, No. 321, of Ashton; 40 members.
John Bright Lodge, No. 296, of Providence; 20 members.
Abraham Lincoln Lodge, No. 277, of Central Falls; 100 members.
What Cheer Lodge, No. 298, of Olneyville; 30 members.
Ashton Cornet Band, Ellis Hibbert, leader; 22 pieces.
Deutche Order Harugari.
Members of Theodore Kœrner Lodge, of Pawtucket, accompanying guests from Germania Lodge and Cheruska Lodge; 150 persons.
Guests: The Frohsinn Society, of Attleboro, and Diony's Lodge of Attleboro.
Members of Grand Lodge, D. of H., in carriages.
Order of Alfredians.
James Greenhalgh, commander of brigade No. 4, Marshal.
Aid, Joseph Holland.
Guests from Brigade No. 5, thirteen in number, of Connecticut.
Members of brigades from Providence, and entertaining members of the Pawtucket Brigade; 250 persons.

FOURTH DIVISION.

Marshal, J. H. MOONEY.

National Band, 30 pieces, T. W. Hedley, leader.
Conclave No. 28, K. S. F., of Providence; 66 men.
Carriages containing Sir Knights.
Conclave Olneyville, No 30, K. S. F.; 40 men.
Court What Cheer, No. 6,011; 30 men.
Central Falls Drum Band, E. Kelly, leader; 16 pieces.
Court Flower of Dexter, No. 7,687, of Central Falls: 60 men.
Court Love and Truth, No. 6,077, A. O. F.; 40 men.
Court City of Pawtucket, No. 7,384; 60 men.
Court Fidelity, 6,626; 30 men.
Court Flower of Blackstone, 6,397; 38 men.
Mount Hope Flute and Drum Band; 16 pieces.
Court Hope, Providence, 7,473; 60 men.
Court Philip Allen, 7,742; 50 men.
Court Washington, 7,481, East Providence; 40 men.
Court Mt. Carmel, 7,651, Manville; 75 men.
Court Thomas W. Dorr, 7,845; 50 men.
R. I. Fife and Drum Band; 6 pieces.
Court Elmwood, 7,867; 80 men.

FIFTH DIVISION.

Marshal, EDWARD MCCAUGHEY.

Aids, Patrick J. McCrory, John McGrath, James P. Brady.
Greenville Cornet Band; 18 pieces.
St. Mary's T. A. B. Society; 35 men.
Sacred Heart T. A. B. Society; 41 men, 2 musicians.
St. Joseph's T A. B. Society; 45 men.
Young Irelanders' Association; 200 men.
Irish National Foresters; 75 men.

SIXTH DIVISION.

Marshal, ANDRE BLANCHARD.

Merriville Band of North Providence, O. Demers, leader.
L'Union St. Jean Baptiste of Pawtucket; 59 men.
Sons of L'Union St. Jean Baptiste Society; 66 boys.
Cercle Jacques Cartier, Central Falls; 50 men.
Continental Band, Providence, J. E. Thompson, leader; 12 pieces.
St. Jean Baptiste Society, Providence; 50 men.
Society St. Jean Baptiste, Central Falls; 90 men.
Chariot of allegory, drawn by Henri Topier, Joseph Masse, Louis Manard, William Jette.
Providence Band, G. Caponi, leader; 20 pieces.
Societe Italiana Bersaglieri of Providence; 65 men.

NORTH MAIN STREET, FROM THE SQUARE, PAWTUCKET.

CHAPTER VI.

THE CENTENARY CELEBRATION.

(CONTINUED.)

FOURTH DAY: FIREMEN'S DAY—TRIAL OF VETERAN AND ACTIVE FIRE ENGINES—EXHIBITORS' BANQUET—FIFTH DAY: PAWTUCKET BOAT CLUB REGATTA—BICYCLE RACES—TROTTING MATCHES AT THE PARK OF THE PAWTUCKET DRIVING ASSOCIATION—KING KOTTON KARNIVAL—SATURDAY: DEDICATION OF THE COLLYER MONUMENT.

HENRY E. TIEPKE,

CHAIRMAN OF CENTENARY CELEBRATION COMMITTEE.

FIREMEN'S DAY.

A parade and muster in which the veteran and active firemen participate, is always an attractive feature in the vicinity of Pawtucket, for it and its neighboring city of Providence have kept up the interest in fire matters by active organization, a good fire department, and the possession of the best machines in the market. Firemen's day, therefore, was an attraction to members of veteran and active companies all over New England, and the interest was increased by the presence of fire laddies and their friends from many distant points. Some of the firemen had sent their favorite "tub" the day before, and on arrival found it in the hands of the Veteran Association. The feature of the day was early manifest in the red shirts and fire hats of the men, and careful arrangements had been made by Chief Marshal Fairbrother, who was enabled to start the parade very near to the appointed hour. About 11 A. M. the line moved in the following order:

Chief of Police Oliver H. Perry.

Deputy Sheriffs Briggs and Rogers, Captain Eugene Rhodes, Sergeant Nickerson.

Platoon of mounted police, commanded by Officer Tompkins.

Chief Marshal, GEORGE J. FAIRBROTHER.

Chief of Staff, Benjamin F. Davis.

Aids to Chief Marshal: Samuel Jackson, Joseph Osfield, Jr., Thomas M. Sweetland, C. E. Thurber, Thomas Martin, J. H. Byrnes, Harry Cheek, J. F. Riley, John H. Davis, C. H. Baker.

Reeves' American Band, D. W. Reeves, leader; 35 pieces.

Line of Carriages.

First Carriage: President Olney Arnold of the Pawtucket Veteran Firemen's Association, Chief Engineer George A. Steere of Providence, Chief Engineer Frederick Macy of New Bedford, Ex-Mayor Goodwin of Pawtucket

Second Carriage: His Excellency Governor Davis, and Colonels J. Howard Smith, P. E. Hayes and Von Gottschalk, A. D. C. of His Excellency's personal staff.

Third Carriage: Colonels Thomas J. Peirce and William J. Nichols, A. D. C., of His Excellency Governor Davis' personal staff, and Superintendent of Pawtucket Water Works Edwin Darling.

Fourth carriage: Charles R. Bucklin, City Auditor of Pawtucket; T. Blanchard of Providence; R. B. Nye, Chief Engineer of Attleboro.

Carriage containing Colonel A. C. Eddy of the American Hose Company, Philadelphia, Colonel Robert McCloy, ex-Chief Engineer of the Pawtucket department; C. H. Buckley of Lynn, Captain F. M. Bates of the Pawtucket veterans.

FIRST DIVISION.

Marshal, REUBEN A. BARBER.

Pawtucket Veteran Firemen's Association, Captain Joshua Lothrop; 100 uniformed men.

The Hay Cart Machine; 100 un-uniformed members.

Pleasant View Drum Corps; 15 pieces.

Lowell Veteran Firemen's Association, Foreman George F. Salmon; 80 men. Tom Curtis as "Mose."

Deluge Machine, of Pawtucket, to be used by Lowell Company at Camp Burnside.

Two carriages containing guests.

Boston Cadet Flute, Drum and Bugle Corps, Thomas J. Ryan, leader; 25 pieces.

Charlestown Veteran Firemen's Association, 160 men on the ropes and 100 men in citizens' dress.

The Torrent Fire Engine, built by Jeffers in 1841, for the city of Brooklyn, called "The Veteran."

American Drum, Fife and Bugle Corps of Boston A. T. Weintz, leader; 30 pieces.

Roxbury Veteran Firemen's Association; 100 men in uniform and 25 citizens.

Tremont Engine, No. 7, built by Hunneman in 1842, and called the "Roxbury Veteran."

Carriages containing guests.

JOHN BRIERLY,

CHIEF ENGINEER OF PAWTUCKET FIRE DEPARTMENT.

SECOND DIVISION

Marshal, FRED A. PATT.

Aids, Thomas M. Sweetland, J. H. Byrnes.

Four axemen, in red shirts.

National Band, T. W. Hedly, leader; 35 pieces.

Providence Veteran Firemen's Association, Edward W. Hall, President; 75 men in first division, 80 uniformed men in second division.

Gaspee Engine, belonging to Providence Veteran Firemen's Association.

Six carriages containing officers and aged veterans of Providence Veteran Firemen's Association.

Alpha Drum Corps, Thomas Giles, leader; 25 pieces.

Boston Veteran Firemen's Association, J. Stover Jacobs, captain; 200 men.

Engine "Boston," built by Hunneman.

First Regiment Band Drum Corps, Handel Campbell, leader; 25 pieces.

Barnecoat Veteran Association, Boston; 55 men.

National Drum Corps, Beverly, Mass., A. Williams, leader; 14 pieces.

Peabody Veteran Firemen's Association; 70 men.

Engine "Peabody," formerly called "Torrent," built by Hunneman.

Carriage containing Vice President B. B. Humphrey, Treasurer P. L. Winchester, Secretary W. P. Wilkinson and George Stevens. Peabody V. F. A.

Carriage containing J. M. Benson, C. H. Porter, J. O. Buxton and C. K. Mallard, Peabody V. F. A.

Holbrook Drum Corps, W. A. Cote, leader; 6 pieces.

Brockton Veteran Firemen's Association; 70 men.

Engine "Washington No. 2."

Hancock Engine Company, No. 1, Brockton, 100 men, with engine "Hancock."

Somerville Fife, Drum and Bugle Corps, Ed. Frazier, leader; 15 pieces.

Wakefield (Mass.) Veteran Firemen's Association, 100 men with machine "Yale."

Two carriages containing officers and invited guests of Wakefield Veteran Firemen's Association.

THIRD DIVISION.

Marshal, J. MILTON PAYNE.

Aid, Arthur Horton.

Stone's Continental Band, G. A. Stone, leader; 29 musicians.

Watchemoket Fire Engine Company of East Providence, 57 men drawing hand engine Watchemoket, a Jeffers machine.

Six carriages containing officers and invited guests of Watchemoket Fire Engine Company.

Hancock Fire Association of New Bedford, 41 men; with engine "Hancock," built by Hunneman.

Carriage containing ex-Chief A. C. Moody, Frank B. Drown and M. F. Moody, of Lynn, Hiram Spearing, Pawtucket.

Carriage containing ex-Mayor Frederic Clark Sayles, City Clerk Sibley, City Treasurer George W. Newell and City Solicitor Thomas P. Barnefield.

Carriage containing Lewis Fairbrother and Gideon L. Spencer.

Carriage containing Edmund S. Mason, Proctor C. Lull, Charles M. Arnold and Samuel E. Young.

Carriage containing Judges C. Fred Crawford, Chief Abner Coleman, of Taunton, and Chief H. W. Cozzens of Newport.

Carriage containing Judges Stillman White, George Worrall and Messrs. C. A. Westcott and H. B. Matteson.

Park's Continental Band, 20 pieces, J. F. Park, leader.

Rough and Ready Engine Company, No. 2, of Olneyville, 80 men, drawing steamer Nameaug, a Jeffers machine.

Carriage containing Chief Patt of Central Falls and Messrs. J. Sewell Read, Jay Neill and Charles E. Bullock.

Carriage containing David J. White, Albert C. White, S. F. White and B. C. Bird.

Phenix Cornet Band, F. S. Arnold, leader; 20 musicians.

Phenix Fire Department, Phenix, R. I.; 25 men.

Foxboro Steamer Company, No. 1; 20 men.

Bristol Fife and Drum Corps, E. P. Brownell, Jr., leader; 18 musicians.

Hydraulion Hose Company, No. 1, of Bristol; 42 men, drawing Hydraulion Engine No. 1.

Livingston's Band, J. H. Scholes, leader; 15 musicians.

Columbia Hose Company, No. 4, East Greenwich, R. I; 40 men.

Narragansett Band, Arthur Barrows, leader; 12 musicians.

Narragansett Engine Company, No. 2, Riverside; 80 men with Jeffers machine, formerly the Hercules, No. 7, of Newport.

Union Cornet Band, Quidneck, R. I., John Power, leader; 22 pieces.

River Point Fire Department.

Pioneer Company, No. 1; 20 men.

Alert Company, No. 2; 20 men.

Active Company, No. 3; 20 men.

Carriage containing invited guests.

FOURTH DIVISION.

Marshal, REUBEN H. GLADNING.

Aids, Harry Cheek, Oren S. Horton.

Pawtucket Fire Department, John Brierly, chief engineer; James H. Easton, first assistant engineer; George McDonald, second assistant engineer, in carriage of Chief Brierly.

Steamer Rhode Island, No. 1, James Carr, driver.

Hook and Ladder Company, No. 1, 10 men; Frank A. Newton, foreman.

Hook and Ladder Truck, No. 1; Bernard Riley, driver.

Chemical Hose Company, No. 1, 10 men; Lewis F. Butler, foreman.

Chemical Hose Carriage, No. 1.

Chemical Hose Company, No. 2, 10 men.

Chemical Hose Carriage, No. 2.

Steamer No. 2, Rough and Ready.

Hook and Ladder Truck, No. 3.

Hose Company, No. 3, 10 men; Preston A. Chase, foreman.

Delegation of Woonsocket firemen in blue uniforms.

Hose Carriage No. 3.

Hose Company, No. 4, 9 men; George E. Wilson, foreman.

Hose Carriage No. 4

Hook and Ladder Truck Company, No. 2, 8 men; A. B. McMillan, foreman.

Hook and Ladder Truck.

Steamer No. 3, Monitor.

The parade was through Park Place, Main, School, Prospect, Pond, Summit, Cottage, Kossuth, Broadway, Exchange, High, Barton and Dexter to the dining tent. There was no ceremony, but at 12.45, after all had been served, the line was reformed and proceeded to Camp Burnside, where the trial took place. This was the event of the day, and a crowd was present greater than had been seen in Pawtucket under the auspices of the firemen. Thirteen companies drew for positions, eight veteran and five active. The prizes were in two classes

—veteran and active—those in the veteran class being $150, $100 and $50, and in the active $100, $75 and $50. The judges were: Chief Engineer Abner Coleman, of Taunton; Chief Engineer George Worrall, of Woonsocket; Chief Engineer H. W. Cozzens, of Newport; Stillman White, of Providence, and C. Fred Crawford, of Central Falls. General Arnold L. Burdick, of Newport, timed the engines. The drawing for positions resulted as follows:

VETERAN.—1, Wakefield; 2, Brockton; 3, Peabody; 4, Roxbury; 5, Lowell; 6, Charlestown; 7, Providence; 8, Boston.

VETERAN.

NAME.	DISTANCE.
Charlestown,	194 ft. 10 1-4 in.
Gaspee,	181 ft. 5 1-2 in.
Peabody,	176 ft. 1 in.
Wakefield,	173 ft. 8 1-4 in.
Brockton,	170 ft. 8 1-2 in.
Boston,	171 ft. 1 1-4 in.
Roxbury,	167 ft. 1 1-4 in.
Lowell,	117 ft. 7 1-2 in.

ACTIVE.

NAME.	DISTANCE.
Nameaug, Johnston,	196 ft. 3 in.
Hancock No. 1, Brockton,	180 ft. 11 in.
Watchemoket, East Providence,	179 ft. 3-8 in.
Hancock No. 9, New Bedford,	170 ft. 11 1-2 in.
Narragansett, Riverside,	169 ft. 4 1-2 in

HEAD OF PROCESSION, VETERAN FIREMEN'S DAY.

ACTIVE.—1, Watchemoket; 2, Narragansett; 3, Hancock (Brockton); 4, Johnston; 5, New Bedford (Hancock).

The veteran companies were first at the trial, and the playing of each was watched with eager interest by the friends of the fire laddies. The Roxbury veterans blew out the air chamber of their pet engine at the first trial, and the Gaspees of Providence broke a brake bar, and then two more. The active companies met with no accidents to their machines. After the trials, the judges retired to the headquarters of the firemen's committee, and the result, as decided officially, was announced as follows:

The victors were, therefore, from the veterans, the Charlestowns, the Gaspees of Providence, and the Peabodys: from the actives, the Rough and Ready of Johnston, the Hancocks of Brockton, and the Watchemokets of Providence. The prizes, which were in gold, were presented to the winners by Philo E. Thayer of the muster committee. The engine which defeated all others, active and veteran, was a Jeffers machine, built 40 years ago for the Nameaug Volunteer Fire Company of New London, Conn. It was afterwards purchased by a New Bedford company, then it went to Putnam, Conn., where the Rough and Readys found it abandoned and out of repair.

ISAAC GILL,

CAPTAIN OF PAWTUCKET BOAT CLUB. DIRECTOR OF THE REGATTA.

Thursday evening, the business men who had contributed to the success of the industrial exhibition were given a banquet in Infantry Hall. It was nearly 10 o'clock when supper was served. The stage had been decorated, Reeves' American Band orchestra gave music from behind a bank of potted plants and flowers, and the caterer was Cook, of Boston. George Mabbett, Esq., presided, and after thanking the merchants for the interest that had been manifested in making the exhibition a success, he introduced Charles A. Lee as toastmaster. Speeches were made by Governor Davis, Mayor Carroll, Chairman Tiepke of the council committee, Superintendent Sherman, Rev. J. J. Woolley, General Olney Arnold, F. W. Easton and Major Eugene B. Crocker. The speaking was largely congratulatory, Governor Davis suggesting, among other things, that the cities of Pawtucket and Providence join in such an industrial exhibit every two years. It was agreed by all that the display had been very satisfactory, and had resulted in good to the exhibitors.

CLOSING DAY.

For the final day of the festivities there had been arranged a regatta under the auspices of the Pawtucket Boat Club, to be participated in entirely by amateur oarsmen. For the first time in the week the sun was clouded, and the prospect for a race was not flattering. Crowds gathered along the banks of the river. Reeves' Band was stationed at Dunnell's Park, the oarsmen assembled, the shells were lifted into the water, and at 10 A. M. the gun was fired for the boats in the first race to take positions. The officials in charge of the regatta were: Walter Simpson, President of the New England Amateur Rowing Association, referee; James S. Aborn, of the Narragansett Boat Club, starter; James R. Doyle, of the Crescent Boat Club of Boston, J. Frank Facey, of the Riverside Boat Club of Cambridge, Mass., judges at the turn; Willard A. Winn, Secretary of the N. E. A. R. A., and Seth Sprague of the Neponset Boat Club, judges at the finish; Fred W. Dexter and J. L. Wheaton, Jr., time-keepers. The first six races were trial heats. The first was for single row-boats. There were six entries, and the race was won in 11:43¾ minutes by John Fox. The prize was a water pitcher, with gold-lined goblet. The second was for intermediate sculls, a distance of one mile, and was won by Eugene Buckley, of Cambridge, against three competitors, in 7:11¾. The third was for a distance of one mile in single sculls, and was won by A. A. Frates, of Portland, Me., in 6:56½, against five competitors. The fourth was for junior singles, one mile; H. A. Adams, of Worcester, came in first, in 7:04½; four entries. Thomas E. Quinn, of Portland, Me., won the fifth heat, which was a junior single, one mile, in 7:07, against four competitors. The sixth race, a senior single, two miles, was won by William Caffrey, of Lawrence, Mass., in 13:48¾, against three competitors.

The seventh was a final heat between Buckley and Frates, and was the exciting race of the day. Buckley was the winner, in 14:03¾. The prize was a gold watch.

The eighth race, a final heat between winners in the preliminary heats, was won in 15:03, by A. C. Dowling, of Boston, who received an elegant gold watch as a prize. Distance, two miles.

The ninth race was a quarter-mile dash, and was won by Joseph Bergin, of Cambridge, Mass., in 1:24; the prize being a pair of field glasses.

The tenth race was for working boats, for which three crews entered. The distance was two miles, and the race was won by a crew from the Bradford Boat Club, of Cambridge, Mass.; time, 14:18. The prize was four solid silver goblets.

The eleventh race was for working boats, juniors, distance two miles, and was won by the Narragansett Boat Club, of Providence, in 13:29. The prize was four solid silver goblets.

The twelfth race was for double working boats. There were four entries. The winners were Woodbury and Crowell, who each received a cathedral clock. The time was 10:15.

In addition to the prizes, a silk banner was given to each winning crew, and each winner in the singles.

In the afternoon, the bicycle and horse races took place at the track of the Pawtucket Driving Association. There was a three mile bicycle race, a half-mile boys' race, and a single mile race of local riders. The three mile race was won by W. Mont Scott; prize, a gold medal. The boys' half-mile race was won by William F. Almy; prize, a silver watch; and the mile race was won by W. Burt Gardner; prize, a gold medal.

The horse races followed. There were three races, a free-for-all, with a divided purse of $500; a 2:40 class, with a divided purse of $250, and a running race, with a divided purse of $100. The first race was won by Olaf, blk. g., owned by Highland Stock Farm. In the 2:40 class there were five entries, and the race was won by Anarchis, owned by D. W. Caton. The running race was won by Esterbok, owned by W. A. Peck, Providence. The judges of the races were Roger F. Capwell, John W. Cass and John H. Collingwood.

THE COTTON CARNIVAL.

The closing exercises of the week, as far as the formal order was concerned, consisted of the parade of King Kotton in a grand carnival, followed by a ball. This was carried out in the evening very successfully, though the paraders in the carnival were not as numerous as would have been the case had the weather been more propitious. Postponements, however, were not in order at this centenary exhibition, and the carnival took place amidst the blowing of horns and general jollity. The line was formed on Pine Street and vicinity, and marched substantially in the order arranged. The troop of bicyclists, who were to serve as escort to the chief marshal, was materially diminished on account of the condition of the streets. The procession moved in the following order:

Officers Arthur and McGlone, mounted.

Troop of bicyclists. H. L. Spencer in the costume of a knight, Marshal. Aid, H. E. Rathbun, representing Uncle Sam; Chas. A. Gloyd, clown; Arthur Hollingworth, Mexican; Armand Gobeille, page; Willie Dawson, lady; John Smith, page; John B. and William Nicholson, princes; Charles Deacon, red coat and cotton pants; H. E. Mabbett and Louis Slocum, tandem, the former dressed as a lady, the latter wearing armor and silver helmet; William Leonard, decorated arch over wheel with a picture of Slater in the arch; Andrew Meiklejohn, white costume and cotton arch; Alex. Meiklejohn. Uncle Sam with cotton decorations on wheel; Charles Fuller, Frank E. Tingley, W. H. Dawson, L. L. Lull, Elijah Phinney, torches on their wheels; Joseph Wright, princess; S. Hyndman and C. Carvell, heralds, dressed as knights.

Prince Carnival, Major Eugene B. Crocker, dressed in an elegant costume of a prince, the shoulder cape being of red silk with stripes of colored ribbons.

Field Marshal, Benjamin F. Davis.

Admiral, Colonel W. Howard Walker.

Chief of Personal Staff, Bertrand J. Horton.

Personal Staff, J. Milton Payne, George B. Olney, Samuel Jackson, Henry H. Sager, William J. Mahoney, Alexander Strauss, John Coyle John F. Clark, Edgar K. Gridley, all mounted and dressed in costumes of courtiers.

Reeves' Band, 35 musicians.

Chief of the Honorary Staff, Colonel James W. Larkin.

Honorary Staff, consisting of the Royalty of the World and Natives of the Antipodes. Dennis A. McElroy, chief of staff; W. H. Boardman, N. L. Upham, H. Cheek, senior,

CHARLES H. BUTTS,

GENERAL FLOOR DIRECTOR AT CARNIVAL BALL.

MAJ. EUGENE B. CROCKER,

CHAIRMAN OF COMMITTEE ON KING COTTON CARNIVAL.

D. Hamilton, J. S. Brazeau, George Dewsnap, H. O. True, J. H. Crossley, C. E. Thurber, T. M. Sweetland, C. E. Rupert, W. F. A. Gillan and George C. Arnold.

King Kotton on his throne, represented by Charles Rittman, with two pages at his feet. The chariot of the King was drawn by six horses, wearing blankets of cotton, driven by Patrick Butler. The chariot was elegantly decorated. On each of four corner seats sat four ladies magnificently dressed representing queens from the four points of the compass, who had become subject to King Cotton. The chariot of the King was attended in court costume by Harry Gould, James Burgess, W. P. Mitchell, C. E. Loomis, J. Allen, L. A. Johnson, A. Jenks and Harry Morris.

Uncle Sam, preceding the Goddess of Liberty, was represented by Albert E. Sherman, 6 feet 2 inches tall.

Chariot of the Goddess of Liberty, drawn by four horses draped with the stars and stripes. On the front was the tri-color of the United States and a border of American flags. The Goddess of Liberty was represented by Miss Florence Baker, and her throne was surrounded by representatives of the four branches of the service: navy, infantry, cavalry and artillery, in regulation uniform. The body guard consisted of six sailors on each side on foot, lighting colored fire, and six soldiers with torches to enlighten the world.

Lord High Executioner, Charles L. Abbott, mounted and in the costume of a Lord.

Butchers in blue frocks, twenty in all.

Two steers of the Prince and Princess of Butchers.

CONGRESS OF NATIONS.

Marshal, REUBEN A. BARBER, mounted.

Aid, J. Milton Payne, mounted.

Chinese house on a float, conveying the "Three Little Maids from School." The house was decorated with fans, panels, Turkish rugs and lanterns, while butterflies and bunting were hung over the light roof.

GERMANY.—Three large floats. The first was a model of the first brewery in America, represented as belonging to William Penn, with log cabin beside it, located down the Delaware. The model was built and sent out to Pawtucket by H. J. & J. N. Molter of the What Cheer Lager Beer Brewery of Cranston. It was designed by Henry T. Molter. The float on which it was raised was 24 feet long, and drawn by six horses driven by George C. Patterson. The next was a tremendous cask, which would hold 40,000 gallons. On the top of it sat Uncle Sam in full costume, King Gambrinus, with his crown on his head and his robes and sceptre, and with him were two parsons. Following was an old German windmill, "Alte Weile Mühle," supposed to rejuvenate old women. Old women were seen to go in and come out dancing, as young maidens, on the opposite side. The floats were followed by Germans in clown and miners' costumes.

GREAT BRITAIN AND COLONIES.—A large float, drawn by six horses, containing Victoria, Queen of England and Empress of India, on her throne, surrounded by subjects from all parts of the world. The characters were taken by members of the order of Alfredians and the representation was in charge of Charles Dowler, of Providence. These were the characters: Queen Victoria, Mrs. Mary Nerr; Prince of Wales, William Holland; African Arab, Washington Broadhead. Peasant girls in attendance on the Queen, Miss Emma Dawson, Miss Annie Lowden, Miss Della F. Arnold and Miss Alice Ashbourne. Duke of Edinburgh, Mr. James Kenyon; a Canadian gentleman, George Fredenborgh; a Prince of India, J. W. Greenhalgh; a British Guinea negro, Henry Baker; a native of Hong Kong, Fred Wilde; a Gibraltar native, Alfred Chilee; Australian bushranger, George Roberts; the army and navy, life guardsman, George Kenyon, and man o'warsman, John J. Kenyon.

FRANCE.—A French-Canadian log hut, contributed by the French-Canadians of Pawtucket and Central Falls. It was a family scene intended to represent a colonist's hut in 1780, in Canada. There were some twenty persons in and around the hut. An old spinning-wheel stood at the door, and an elderly lady was spinning. At the rear was a live goat and a group of children. It was arranged by a committee in charge of J. B. Brazeau.

SCOTLAND.—The float of the Scotch residents was entitled "Scotland by Music and Poetry," and consisted of tableaux representing "Robert Burns at the Plough" and "Tam O'Shanter and Souter Johnnie." The character of Robert Burns was taken by Mr. John Ferguson. He was dressed in a blue coat, white knee trousers, gold vest with lace ruffles. The second tableau represented the tavern scene in "Tam O'Shanter." Tam O'Shanter and his bosom crony, Souter Johnnie, were seated by the table in the tavern, drinking the friendly glass which ended so disastrously for poor Tam. In addition, David S. Fraser and George A. Saunders in Scotch costume rode on the float, singing Scotch songs at intervals.

ITALY.—This float represented Christopher Columbus' discovery of America. This was designed by the Italians of Pawtucket, and Frank Machetti was in charge on this occasion. A figure of America, a young Italian girl, sat upon the deck of the boat, beautiful, and dressed in the American colors, with a crown and a sceptre. The float was decorated with Spanish, Italian and American colors, to show that Columbus was an Italian, that the Spanish treasury sent him upon the expedition which resulted in the discovery of the third country, America.

TRIBES OF INDIANS.

Chief CHARLES E. PIERCE, Marshal, mounted.

Aids, A. N. Cunningham, Thomas Dawley, John Evans, Thomas King, John Powers and other "big injuns," mounted.

Tahoma Tribe, No. 5, Improved Order of Red Men, Providence, in command of Assistant Chief Henry A. Goodwin; 16 braves.

Watchemoket Tribe, I. O. R M., East Providence, Chief Jeremiah Dornsife; 20 braves.

Ancient buggy, labelled "Heirloom of Samuel Slater, 1793-1890," containing William Rhodes and H. H. Hardy of Watchemoket Tribe.

Float of Watchemoket Tribe, representing the landing of Roger Williams.

Tally-ho coach of Watchemoket Tribe, with 12 scouts, representing famous characters in border history.

Ossamequin Tribe, I. O. R. M., Pawtucket, Chief Warren Fales; 16 braves.

Pettaconsett Tribe, I. O. R. M., Providence, Chief James A. McKenna; 16 braves.

Floats of Ossamequin and Pettaconsett Tribes, representing the treaty between Samuel Slater and the Indians.

King Philip Tribe, No. 1, I. O. R. M., Providence, Chief Alfred Mowry; 12 braves.

Float of King Philip Tribe, adorned with explanatory transparencies, and representing the red men of 1632, and the red men of 1890.

GRAND ARMY OF THE REPUBLIC.

Captain J. E. MASON, Marshal, mounted.

Aids, T. M. Sweetland, C. E. Thurber, mounted.

Pleasant View Drum Corps, P. Kavanagh Drum Sergeant; 10 pieces.

Tower Post, No. 17, G. A. R., Pawtucket, Commander J. F. Means; 50 comrades.

The float of Tower Post was designed to represent a realistic picture of army life.

Decorators' Brigade, composed of exterior decorators, representing Hartford, Springfield, New Haven, Brooklyn and New York; Captain Charles Griswold, Musician J. Hanson, Lieutenant Oscar Buchholz.

A. K Tilton Camp Drum Corps, H. Edgar, Jr., leader; 11 pieces.

A. K. Tilton Camp, Sons of Veterans, Pawtucket, Captain James Mason; 75 members.

The float of Tilton Camp represented the parade ground of a Brigade of Rhode Island militia.

At the rear of the procession was a detachment of Antiques and Horribles, a tally-ho coach loaded with Providence people in costume, and equipages of a miscellaneous character.

It was 11 o'clock before the column was dismissed and the grand ball was inaugurated at the great tent in Dexter Street. It was estimated that nearly 3,000 persons were present at the opening. Only those in costumes were allowed to dance before midnight. About one hundred and fifty couples were in the grand march, which was led by floor-director Charles H. Butts, followed by Prince Carnival and lady, and King Cotton and lady. Reeves' band furnished the music, and supper was served after midnight by S. B. Havens & Company, of Pawtucket. Governor Davis and staff, Mayor Carroll, and the members of the city government, Chief Marshal General Olney Arnold and other distinguished guests were present. The officers of the ball were general floor director, Charles H. Butts; assistant floor directors, Robert H. Harvey, Eason L. Slocum, Jr., Fred A. Appleyard, William W. Lindsley, Lieutenant Charles Gardner, Lester W. Upham.

During the week there were entertainments of a private nature, some of them *impromptu*, but all equally enjoyable to the participants. The guests of the city and visitors from other cities and states were entertained at the office of the Mayor, and the hospitality of the city was generously extended. The decorations were profuse on all the streets of the city, and many of them very elaborate. There was scarcely a house or store on the route of the processions that was not covered with bunting or drapery. Pictures of Samuel Slater abounded, and the beautiful weather allowed the displays to remain intact the entire week. A list of the decorators would include almost a directory of Pawtucket, so universally was this addition to the general festivity taken up by the citizens. Arches twenty-one feet high were placed at each end of Main Street bridge, at the junction of Broad Street and Trinity Square, at the junction of Slater and Harrison streets, and across Broadway, at the junction with Cottage Street. The entire front of the Old Slater Mill was tastefully decorated. On the top was a card, giving the date of its erection, 1793, and on the right-hand side, over the door, was hung an oil painting of Samuel Slater, set in a gold frame, and on the other side a banner bearing this inscription, "Old Slater Mill."

DEDICATION OF THE COLLYER MONUMENT.

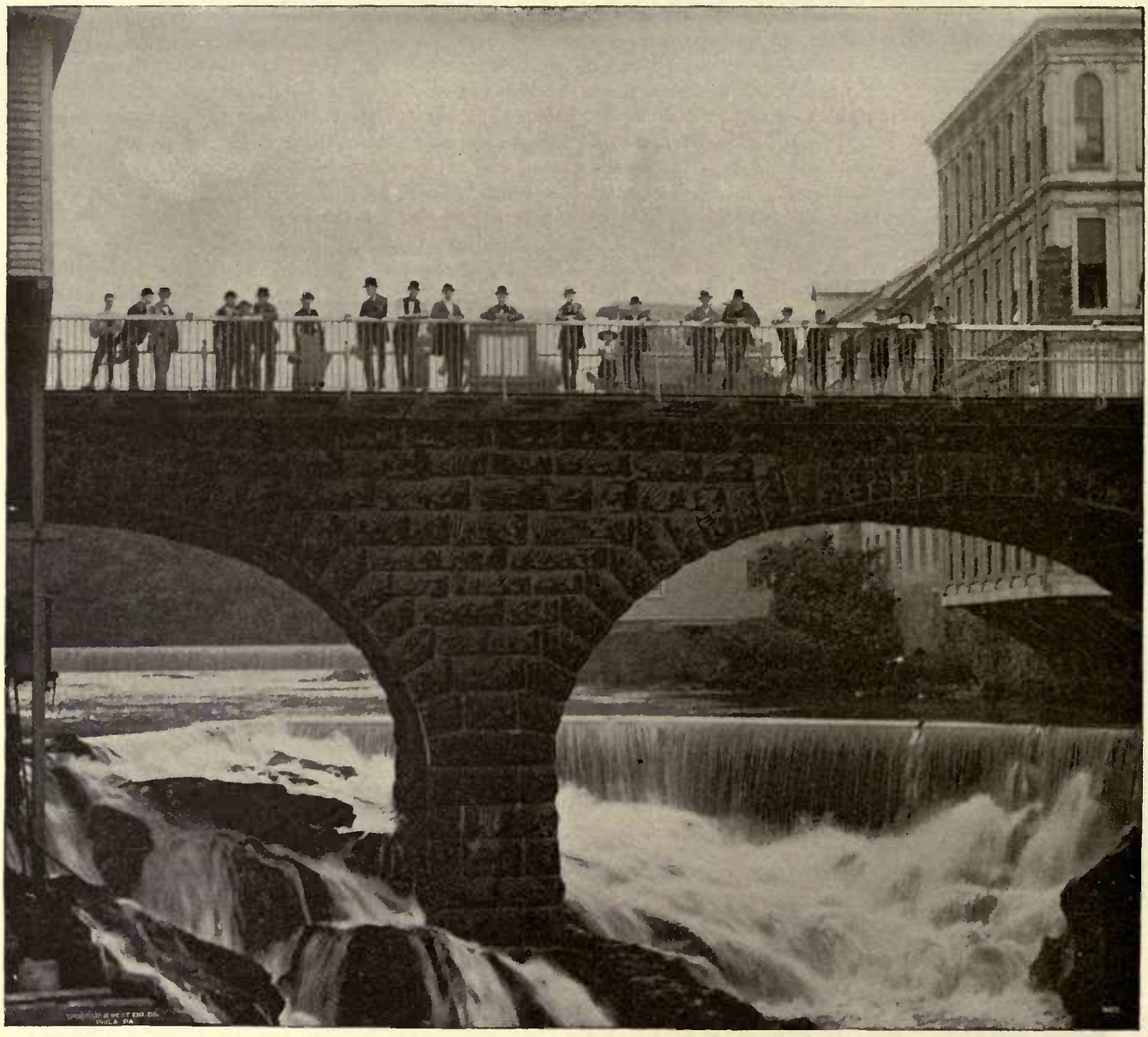
On Saturday, as a closing exercise in Centenary week, though not a part of the official programme, was dedicated the monument which had been erected to the memory of Samuel Smith Collyer, for many years chief-

engineer of Pawtucket, and who lost his life in the service of the city. Mr. Collyer was born in Pawtucket, May 3, 1832, and ran with the old Rough and Readys when but 15 years of age. Later he was chosen captain of this company, and from this company he was chosen chief-engineer of the North Providence Fire Department in 1870, and upon the consolidation in 1874, one of the first acts of the new council, May 16, was his election as chief-engineer of Pawtucket, which position he held till the time of his death. The circumstances of his death were particularly sad. On the night of July 7, 1884, there was an alarm of fire, and as the cart of Hose Company No. 1 came past the chief's house, it stopped for him to get on. Instead of standing on the rail of the reel, Chief Collyer climbed over to the seat with the driver. As the wagon went up from Mineral Spring Avenue to Lonsdale Avenue, in making the turn into Lonsdale Avenue, there being no curbing, the wagon struck a boundstone twelve inches high, and the cart was overturned. Chief Collyer was sitting on the side which placed him directly under the wagon, and all of his ribs were broken. There were several others on the cart, only one of them besides Chief Collyer being injured. Chief Collyer lingered for twenty days, when death came to his relief.

Mr. Collyer was held in great respect by the citizens of Pawtucket. He was so good a fireman that, when, for political or personal reasons, there was opposition to his further confirmation as chief of the department, one of the leading insurance officials, representing hundreds of thousands of dollars in fire risks in Pawtucket, appealed in person to one of the members of the council, advising that body that in declining to re-appoint Chief Collyer it would jeopardize the property upon which the company had risks. Such a warning did not go unheeded, and from that time he was undisturbed. About a year prior to the centennial, an attempt was made by H. H. Sheldon to erect a monument in Collyer Square. A subscription paper was started, but there was objection to the location, and the paper was turned over to a committee consisting of John Brierly, Edmund S. Mason, Everett P. Carpenter and Seabury S. Tompkins. The work was largely new, but a substantial encouragement was obtained, and upon the addition of General Olney Arnold's name to the committee its success was assured. At first it was thought to put the monument in Wilkinson Park, but finally, at the desire of the family, it was located at Mineral Spring Park, where the dedicatory services took place.

There was present the entire active department of the city, the Veteran Firemen's Association, and a large concourse of citizens. The firemen, headed by Reeves' Band, marched to Music Hall, where the speakers and guests, Governor Davis, Mayor Carroll, the city council and the Providence Veteran Firemen's Association were received. The line then proceeded up Main Street to

DEDICATION OF COLLYER MONUMENT.



PAWTUCKET FALLS, 1890.

Photographed by Stoddard.

Mineral Spring Park. After an appropriate selection by the band, the monument was unveiled by Edward Collyer Bowen, a grandson of the deceased, prayer was offered by Rev. J. J. Woolley, a short address was given by Governor Davis, who presided, and a tribute. in the form of a historical sketch of the life of Mr. Collyer, was given by Captain Frank M. Bates. The monument was then presented to the city by General Olney Arnold, and received in behalf of the city by Mayor Carroll.

DESCRIPTION OF THE MONUMENT.

The base of the monument is of Westerly granite, and is eight feet in height and four and one-half feet in width. Panels are chiselled on the sides. The one on the front bears a bronze representation of the locality where the accident occurred which cost Chief Engineer Collyer his life. The scene shows an overturned hose carriage, with firemen lying about the ground, and is intended to portray the memorable spot at the corner of Mineral Spring and Lonsdale avenues.

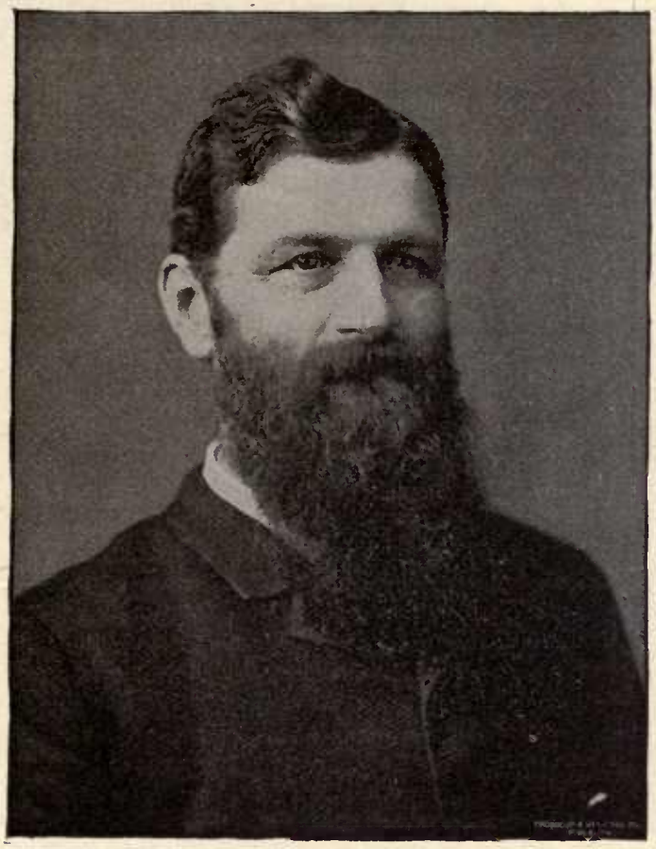
The rear panel is inscribed with the name and age of the hero it commemorates, and other facts relating to his life. The bronze figure of the chief, in an upright position on the pedestal, is seven feet in height and four and a half in width. It represents him standing in a full-dress fireman's uniform, trumpet in hand, his fire hat well pushed back, revealing every feature of his face. The monument was designed by Charles Dowler of Providence, and cost about $2,500.

The tablet, seen below the statue, is of bronze and contains a representation of the manner in which Captain Collyer met his death — the overturned hose cart, the chief lying on the ground beneath the cart, and the other firemen who were injured at the same time. On the reverse, in raised letters cut in the granite and polished, is the inscription, "Erected to the memory of Samuel S. Collyer, who died July 27, 1884, while in the discharge of his duty as Chief Engineer of the Pawtucket Fire Department. Born May 3, 1832."

Chapter VII.

PAWTUCKET AT THE PRESENT DAY.

Its Growth and Prosperity—Its Varied Industries—Favorable Situation for Spinning of Cotton—Recent Increase in Trade—Competition of its Firms with English Manufacturers—Development of the "Plains"—Water and Fire Service of the City—Public Buildings—Public Library and Business Men's Association—Schools and Churches—Social Life—Savings Bank Deposits—Sketches of Leading Industries and Business Men.



ALMON K. GOODWIN,

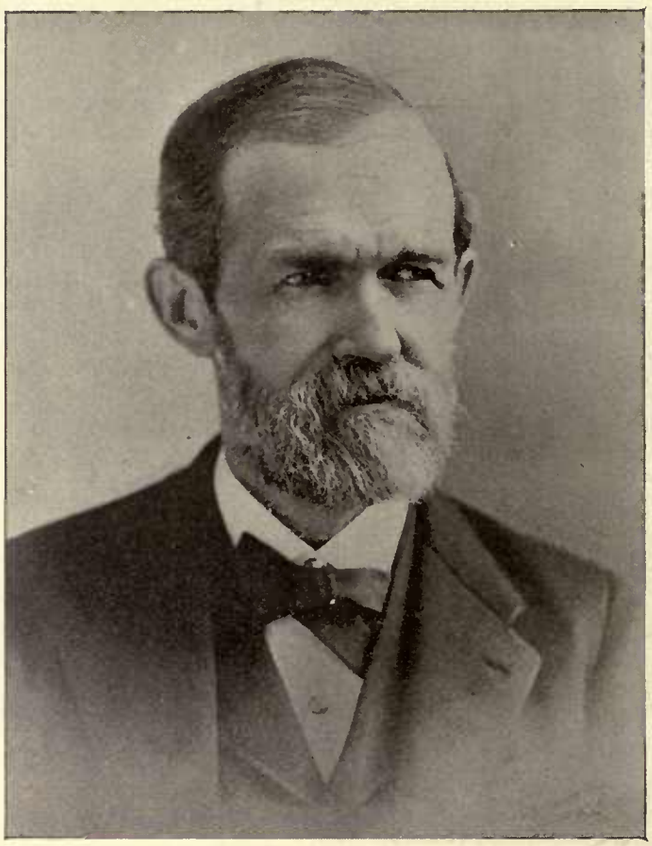
MAYOR OF PAWTUCKET.

Pawtucket of the present day is no longer the Pawtucket of the time of Samuel Slater. Its present prosperity, however, is due to the ability of Slater to reproduce that machinery which was to be the beginning of a great industry. It was far greater than his dreams. From the steady, gradual growth of his time, Pawtucket has become a large, bustling city. Its industries have increased rapidly through that same perseverance and courage that was characteristic of Slater and his associates. The Pawtucket of to-day is the natural growth of the industry which begun in 1790. The old spinning frame which Slater built after so much labor and patience has been supplanted by more modern and rapid machinery. Industry after industry has been directly developed here, until not only is the original spinning of yarn begun by Slater carried on with the improvements rendered possible by the best machinery in the world, but that machinery itself is largely made here, and to the men of Pawtucket is due the credit of many of the developments and inventions that have brought the cotton industry, in all its different branches, to its present success, and made Pawtucket what she is to-day. And all this is but the natural outgrowth of the introduction of the spinning frame. The best and finest cloth that can be made from cotton yarn is produced here. Some of the greatest improvements in the machinery used for this production, as well as in the manufacture of parts of machinery not directly connected with the cotton industry, have originated here. The manufacture of goods for the American market, which have won their way in direct competition with foreign goods, has been begun here, and proved successful, and some of the largest manufactories of Pawtucket are the result of that competition. Further than this, the manufacturers of this city are supplying for England what that country is unable to produce as successfully, and are winning an enviable reputation in the old world.

The productions of Pawtucket are manifold and varied. It is doubtful if any city in the United States, of like population, can show so many and so diversified industries in practical operation. Many of them, as has been stated, are the direct outgrowth of the introduction of the spinning frame. This includes all the improvements in the process of spinning, the bleaching and dyeing of yarn, the manufacture of machinery for use in the mills, the production of belts and belting and lace leather, and the parts of machinery upon which improvements have been made and for which patents have been secured. But there are others which cannot be traced to the cotton industry. There are manufactories of jewelry, there are leather factories, the proprietor of one of these having but recently begun the manufacture of morocco, an industry hitherto neglected in Rhode Island, there are card board factories, carriage building, an establishment for the manufacture of hair cloth, a manufactory of electric supplies, a company making sewing machines for the shoe and harness trade, in use not only in the centres of this traffic in New England and the West, but in England, there are

saw mills, brush manufacturers, makers of boxes of all kinds, a large oleomargarine manufactory, cigar manufacturers, file manufacturers, paper manufacturers, besides others calling for the employment of labor in a greater or less degree.

A writer has said that there is a certain humidity in the atmosphere of Pawtucket favorable to the spinning of yarns, and that the development of this industry presents even larger possibilities in the next century than have been witnessed since the time of Slater. The old mill was built upon the banks of the river, as were also the mills that followed in the early days, and water-power was sufficient to furnish the motor for the machinery. But Pawtucket to-day does not rely entirely upon the water dams for its supply of power. Some of the original mills have been torn down, others have been diverted from their original use, and the steam engine has supplanted the early motive power in many instances. Some of the largest manufactories in Pawtucket to-day have been erected without reference to the proximity to the banks of the river. In the further development of the industries of the city, the substitution of steam for water-power would of necessity be coupled with an increase in expenditure, unless Pawtucket could successfully compete with those places whose direct connection with the great collieries enables them to obtain coal at a low price. But the situation of Pawtucket is favorable; and the stream to the south, which is but a continuation of Blackstone River, is navigable for schooners and barges. The United States government is engaged in broadening and deepening the channel at an estimated cost of $400,000; a part of this has already been expended. The draws of the two bridges which obstructed navigation in the Pawtucket River have been widened, and the large quantities of coal and iron used here will now be readily obtained. The water-power is still, however, available, the privilege of Messrs. Goff and others being ample for the demands of their business, and many of the factories, though compelled to use steam, to a greater or less extent, have by no means abandoned the original power.



HEZEKIAH CONANT,

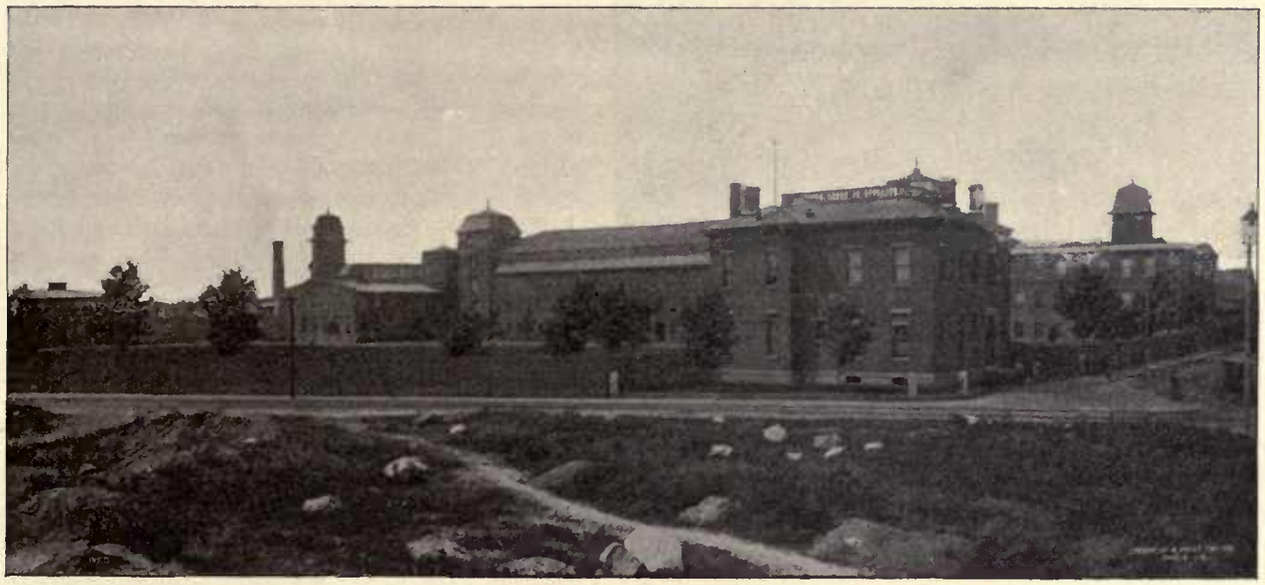
TREASURER OF CONANT THREAD COMPANY.

Since the incorporation of Pawtucket as a city, in 1886, its growth has been steady and permanent. New manufactories have been erected, large blocks have been built and the population has proportionately increased. Its population by the recent census shows a gain of nearly five thousand over the census of five years ago, and is a little less than 28,000. That of Central Falls, in the town of Lincoln, is over 14,000, making an aggregate of 42,000 population in what may be truly called Pawtucket, for the line of division is only an imaginary one. In 1865 the population of the old town of Pawtucket was only 5,000.

Its streets, outside of the main thoroughfare, are well laid out, and the many beautiful residences show the prosperity of its merchants, as well as their enterprise in making Pawtucket a leading city in Rhode Island. But the largest growth since the time of its incorporation as a city has been in the increase of its facilities for supplying merchandise for home consumption, in the erection of new blocks for stores, and their occupancy by merchants who have as fine stocks and do as successful a business as can be shown anywhere in the State. When Mr. H. H. Sheldon, assisted by some enterprising business men who saw the advantage of the situation, erected some buildings on and near what is called Trinity Square, there were few large stores to supply the needs of a growing, bustling population like Pawtucket. The people went to Providence to trade; and the older merchants thought it was impossible to change the current of traffic. But stores were built and occupied. One block followed another. Merchants who saw the trend of events hastened to establish themselves in the line of trade and be prepared to reap a portion of the harvest. Contrary to the expectations of the "croakers," the fine stocks of goods, the ability to meet the prices of the city of Providence, and the courteous treatment which the people received from the merchants, induced the citizens to trade at home and contributed largely to the prosperity of the city, for no place can be constantly prosperous that leaves a large portion of its earned wealth without its domains. To-day Pawtucket's merchants are among the most enterprising in the State, and are wide awake to the necessities of

trade. The city at the same time derived great advantage from this enterprise, the taxes on real estate in 1885 being increased on a valuation of $7,500,000. The property owned by Mr. Sheldon to-day is taxed four times as much as at the time the land was covered with the new buildings, and the increase in the valuation of property and in rentals in this vicinity has been in about the same proportion. The Slater National Bank has recently remodeled and improved its block at a cost of $35,000. A block has been erected on Main Street by the Pacific National Bank, which is one of the most attractive on the street, and it is understood that a like improvement is contemplated by the First National Bank. The finest block in the city, for business and entertainment, is Music Hall, an imposing four story brick building erected in 1880 by Honorable Lucius B. Darling. It took the place of some dilapidated buildings which had been torn down, and furnished a permanent home for many legal firms, corporations and societies, and an opera house, for concerts and dramatic entertainments. The ground floor is occupied by the First National Bank and Providence County Savings Bank, on one side of the main entrance, and by the Boston & Providence Clothing Company on the other. On the second floor is the large hall, or theatre, having a stage ample for the purposes of any ordinary dramatic attraction, and an auditorium excellently arranged, with comfortable opera chairs and private boxes. The upper stories are devoted to offices, and there are small halls in the top story, suitable for church fairs, socials and entertainments, to which there is convenient access by means of an elevator. Kinyon Block, the home of the Young Men's Christian Association, is an elegant building with large tower, stores of different kinds occupying the ground floor. The new building on the corner of Maple and Main streets is also one of the improvements of value to the place.

The prosperity of a city depends upon the success of all its industries; yet Pawtucket's growth in the past and particularly at present has been materially strengthened by a few industries whose productions have come directly in competition with those of the old world, and whose prosperity will be duplicated in the future, under the present condition of things. When the braids manufactured by Messrs. D. Goff & Sons were first put on the market, they were met by an inferior quality of German and English braid sold at a high price. Their merit soon found for them a place in this market, and under the policy of the government the foreign production has been entirely supplanted by their goods and those of other manufacturers. The braid of Messrs. Goff has always maintained its superiority, and is at the same time sold at as low a price as any in the American market. The plush goods recently manufactured by this firm have found a market solely on their merits, against the French plushes, which have been considered the finest in the world, and so great has been the competition that importers have had quantities of these goods consigned at an undervaluation, to be sold at such a price as should drive the Pawtucket manufacturers from the home market. In this they have been unsuccessful, and there is encouragement, under the present tariff, to believe that these goods, like the braids of the same firm, will entirely supplant the foreign production.



VIEW OF THE CONANT THREAD CO.'S OFFICE AND WORKS.

The large establishment of the Conant Thread Company is one of the manufactories of this country which has been supplying the American market with goods which had previously been made across the water. It has found a successful market here, giving employment at lucrative wages to an army of operatives, and its prospects were never more encouraging than at the present time. The E. Jenckes Manufacturing Company, which has been manufacturing cotton and worsted hosiery, both ladies' and gents', has been successfully competing with imported goods in the same line. It has made hosiery for the masses, and such manufactures

W. F. SAYLES,

OF W. F. & F. C. SAYLES, PAWTUCKET.

are finding an ample market at this time. Preparations are being made for a large production the coming season, because many grades of hosiery with which there has been competition will be, to a certain extent, shut out from the American market. And for the further development of this purpose and the better to compete with foreign goods, the Willcomb knitting-machine, for shaping hosiery and underwear and knitting irregular shapes, will be an important aid. Some of these machines have been recently manufactured by the Campbell Machine Company, of Pawtucket.

This latter company is also manufacturing a Campbell lock-stitch wax-thread machine, for use by shoe and harness manufacturers, the invention of Duncan H. Campbell, of Pawtucket, which is in successful use in England, as well as this country. It has been made by the Campbell Company, commercially, for four years, and the prospects for an increased use in England are considered good. There have also been put up in England by the Pawtucket Manufacturing Company machines made by that company for the manufacture of its celebrated nuts and bolts. The company not only manufactures these goods, but builds the machines for their manufacture, and some of these have been put up in England.

All this shows the extent of the enterprise and courage of the Pawtucket manufacturers, and there is certainly great encouragement for the future of the city under conditions which will favor still further exportation of its manufactures, as well as successful competition in the markets of the United States. There is ample room for other manufactures, and the establishment of further industries here, and to this end Mr. Darius Goff, Edwin Darling, W. R. Sayles and others are interested in the development of a piece of land in the eastern part of Pawtucket, known as the "Plains," or "Darlington." It is entirely level, with light, sandy soil, and well adapted to manufacturing purposes. It has been laid out in plats and is owned by different parties, but all are interested in its development. As a step towards this, the New York, Providence & Boston Railroad Company has made a contract for the erection of a freight depot at the entrance to this territory, and has already begun to grade for this purpose. The depot is to be erected within one year, and it is confidently anticipated that it will open up a tract to the advantage of the city. Both Messrs. Goff and Darling will contribute land, it is understood, to manufacturers who will build there. Overtures have already been made, and while nothing definite is assured, it is believed that before another year the citizens of Pawtucket will see an increase in its manufacturing industry in that part of the city. Land is cheap there, and can be bought at from six to twenty cents per foot. There is also an effort being made to have the New York, Providence & Boston and the Old Colony Railroad Companies unite in the extension of the railroad from Red Bridge to the Cove, completing the circuit and making it advantageous for Central Falls and Valley Falls as well as Pawtucket.

Improvement in transportation is still further contemplated in the construction of a street railroad, to start from Park Place and run directly to Providence, over East Avenue. A charter has been applied for, and it has been favorably considered by the past Legislature. If ratified by the coming body the road will be built and the motive power will be electricity, if permission can be obtained. The Pawtucket Street Railway Company is also considering measures for the equipment of its lines in the city by the same system.

One of the great advantages to a city with the population of Pawtucket is the water service, for domestic and manufacturing purposes, and that of this city is not only in fine condition, but is ample for the wants of the people for many years to come. In 1888 a new pumping station was built, making the third in use, and completing the plan originally laid out for the water service. The water is obtained from a stream called Abbott's Run, and the reservoir, which is situated 301 feet above tide water, has a capacity of 20,000,000 gallons, while the demand upon it is but 4,000,000 gallons daily. The construction of the works dates back to 1878, and their growth is demonstrated by the fact that the receipts to the city treasury have increased from about eight thousand dollars in 1879 to one hundred and four thousand dollars in 1889, giving a revenue that is able, according to the latest report of the superintendent, to pay all interest and maintenance accounts in the future and permit a transfer of not less than $10,000 into the sinking

fund of the city. In 1889 a trial of the fire hydrants was made under the direction of the chief engineer, for the purpose of testing the resources of the water supply, and seventy one-inch streams, played through fifty feet of hose, on the twenty and twenty-four inch main, over a space of three miles, were used at one time, and a pressure of eighty pounds was maintained during the entire trial, without diminishing the supply of water for domestic use, which the superintendent of the water works challenged any works in the United States to duplicate. The pumps used are the Corliss high duty pumps, the main pump doing better duty than any known to be in existence.

In connection with its water service, Pawtucket possesses an efficient and well trained fire department, and ample apparatus for the protection of the property of its citizens. The department consists of a chief engineer and two assistants, and fifty-six men. Ten of these are permanently employed and forty-six are call men. There are four fire stations and the apparatus consists of three steamers and a chemical engine with hose carriage combined, carrying 600 feet of hose, besides 200 feet of small hose for the chemical, and a fifty gallon tank, one company working both pieces, three hose carriages, two trucks and an aerial ladder truck, a life net, four supply wagons and a two seated wagon for the chief engineer. The department under Chief John Brierly is in excellent discipline, and on special occasions, when required, it has the aid of the Veteran Firemen's Association, an organization comprising about four hundred members, which has organized itself into nine hose companies, and numbers in its membership some of the bravest firemen and best known citizens of Pawtucket.

The city is well lighted by electricity, both arc and incandescent lights being furnished by the Gas Company, using the Thomson-Houston system. The lights were started November 1, 1883, by the Pawtucket Electric Lighting Company, an organization originated by Lucius B. Darling and Arnold B. Chace, both gentlemen officers, also, of the Gas Company. Under this company lights for streets and for commercial purposes were furnished, when the plant was purchased outright by the Gas Company in 1889 and there is furnished 1,700 incandescent lights and 700 arc lights. One hundred and eighty of these arc lights are for street purposes, and are run by the moon schedule, fifty of them all night, and the remainder till one o'clock. The commercial arc lights are furnished until eleven o'clock, and the incandescents for the entire twenty-four hours.

One of the institutions of the city is the Free Public Library, situated at present in pleasant quarters in Sheldon Building, near Trinity Square. The patronage of this library is very creditable to the citizens of Pawtucket, and its usefulness is by no means confined to the circulation of books which is recorded at the desk. In 1876 the Pawtucket Library Association presented to the town 4,700 volumes of standard works, and a room was offered to the town, rent free, for five years, by Gideon L. Spencer. Since that time the number of volumes has greatly increased, the library containing to-day nearly twelve thousand. The reading-room, which occupies nearly half the library, is an important feature, filled with all the illustrated literature of the day. It contains the periodicals published in the country, both the monthlies and weeklies, a file of every New York and Boston daily paper, as well as Providence and Pawtucket papers, and it is not infrequent to see an hundred people at one time, of all ages and both sexes, examining the books and magazines in the library-room. It is often that the youth of the city are largely in the majority, while the decorum manifested and the character of the literature which they are seen to peruse cannot fail to make them useful and worthy citizens of the commonwealth in years to come. The library is open every day, Sundays included, the latter innovation having been accomplished within a few months.

In 1881, the Pawtucket Business Men's Association, similar in its object to what is known in many places as a board of trade, was organized. The first meeting, in response to a circular issued by Franklin A. Steere, now deceased, was held in a room in Music Hall, November 16, 1881, a committee was appointed to canvass the business men and prepare plans for organization, and at a meeting held December 5, 1881, the organization was completed and Hon. Frederic C. Sayles was chosen president. Mr. Sayles declined in 1886, and subsequent presidents of the association have been Hon. Henry A. Stearns, Hon. Daniel G. Littlefield, and Hon. Lucius B. Darling. A room in Music Hall Building has been

F. C. SAYLES,

FIRST MAYOR OF PAWTUCKET.

secured and handsomely fitted up, and regular meetings of the association are held the first Monday in each month, with the annual meeting for choice of officers in January. The association numbers on its membership roll the leading business men of Pawtucket and Central Falls, and the regular meetings have been interesting and instructive, at the same time bringing into prominence ideas tending to benefit the city commercially and industrially. The proposition for the observance of the cotton centennial was broached by Captain Jenks at a meeting of this association, and a committee of its members has been appointed to supplement the work of the celebration by soliciting subscriptions for a suitable memorial* to Samuel Slater.

The seed sown by Samuel Slater in the early days of Pawtucket, who realized that moral and spiritual education went hand in hand with commercial prosperity, has borne good fruit. There are twenty-two churches in the city, and the people of all denominations find a convenient Sabbath home. There are three Episcopal churches, four Roman Catholic, two Congregational, three Baptist, two Methodist, one Universalist, and a New Jerusalem, Quaker, and the denomination calling itself Christian. All these are well attended, and the result is seen in the character of the people. There is a flourishing branch of the Young Men's Christian Association, which furnishes entertainment of a varied nature to its members, and has classes for instruction in bookkeeping and other branches of useful learning. It also has a gymnasium and a large tract of land devoted to athletic sports.

ALFRED H. LITTLEFIELD,

MANUFACTURER, GOVERNOR OF RHODE ISLAND 1880-1883.

Pawtucket appropriates a large sum for the support of its schools, which are among the best in the State. Its societies for benevolent purposes are numerous, and fraternal and beneficiary organizations abound. These are confined by no means to the population of American descent, but are found equally among the adopted citizens, both of Irish, French and German nativity. There are four newspapers, two weekly and two daily. *The Pawtucket Gazette and Chronicle* is one of the oldest papers in the State, and the *Daily Times*, a well printed eight page paper, has recently added a valuable plant. The other daily is the *Tribune*, and all the papers appear to have the liberal support of the community.

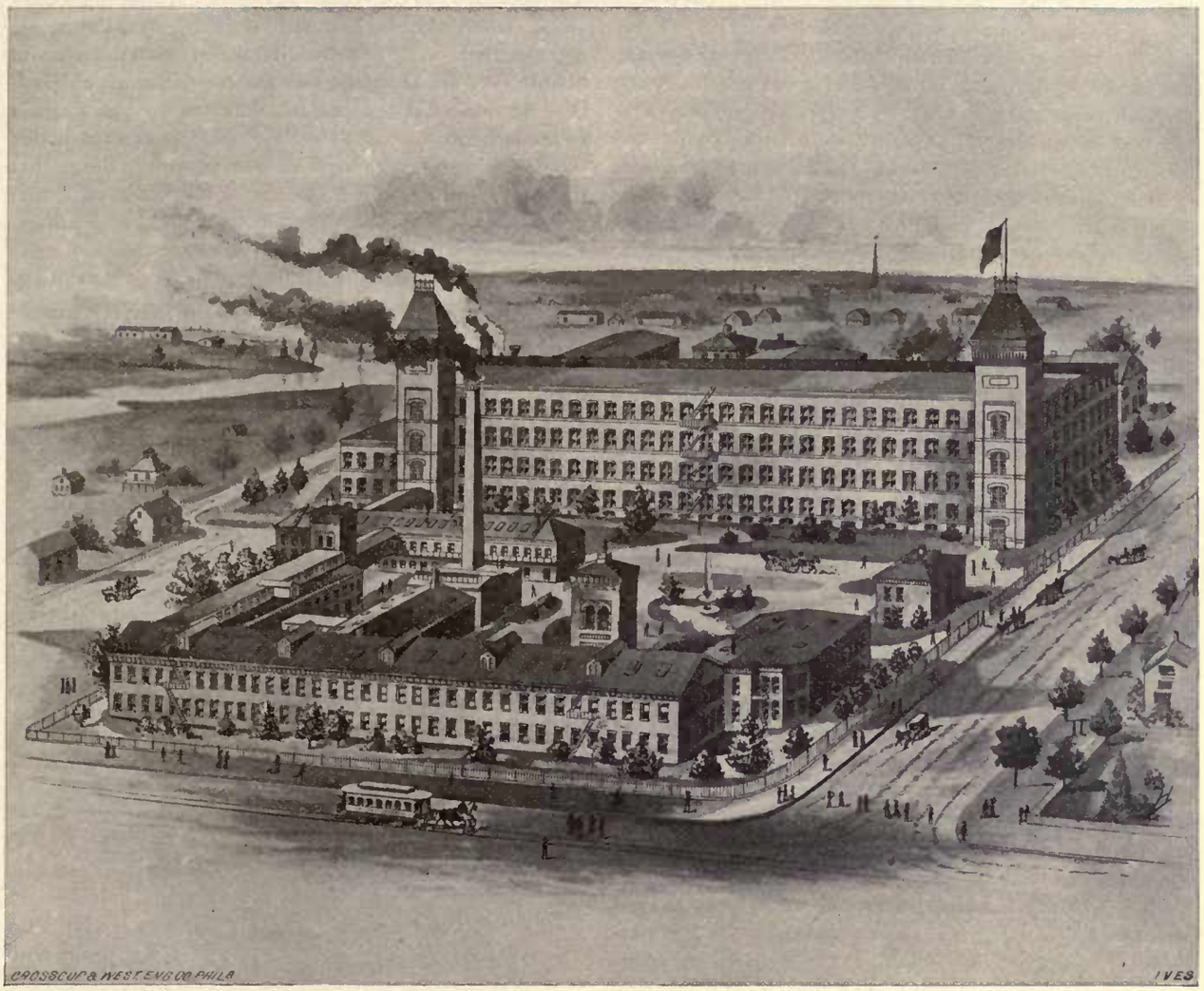
A feature of the social life of Pawtucket is the condition of the workingmen of the city, and the harmony of feeling that exists between employers and employes. The industries are so varied — a temporary depression in one being often identical with unusual prosperity in another — that labor troubles are infrequent. There are few labor organizations, and little occasion for strikes. The laborers are largely industrious and intelligent, and are well paid. One of the manufacturers of cotton yarns stated that he was paying as high wages as during the late war, a fact which speaks volumes for the liberality of the employers, and contributes to the prosperity of the workmen. The employes of the largest establishment in the city are earning good wages, and many of them are possessors of a handsome bank account.

The residences in Pawtucket are largely owned by their occupants; it is stated on good authority that there are fewer houses for rent in Pawtucket than in any city of its size in the country. The Providence County Savings Bank, in particular, has manifested a very liberal policy towards the workmen in loans for the erection of homes, and has been a great aid to Pawtucket in this direction. It has encouraged the workingmen to build their own homes, and the bank has found this class of loans to be the best investment it has made. The loss has been very inconsiderable. The deposits of this bank are large, being, by its statement October 28th, $1,227,006.63, and its surplus $102,128.65. This is true of the other Savings Banks, the deposits of the Franklin Savings Bank being $1,110,677.49, and the surplus $99,978.61, and the deposits of the Pawtucket Institution for Savings being $2,328,381.96, and the surplus $212,349.83. This makes a total of deposits in the three banks of nearly five millions of dollars.

The situation of Pawtucket, midway between New York and Boston, makes it easy of access to either of these great markets, to which transportation can be made by rail or water. There is no city more favorably situated, or whose prospects for an increasing business prosperity are more flattering than Pawtucket. The growth of the past years must continue, for the conditions are all favorable to such growth.

The history of the important industries of Pawtucket is to a large extent the history of the city itself, and a brief sketch of some of them and some of its leading business men, will be interesting.

*Two plans for a monument to Samuel Slater had been submitted before the celebration; that of Captain Henry A. Jenks, which was submitted to the committee chosen by the Business Men's Association, and that of Superintendent Albert R. Sherman, who had a model on exhibition in the hall of the industrial exhibit. The matter of soliciting subscriptions for a memorial is now in the hands of a committee from the Business Men's Association and there is a feeling among the citizens that it may take the shape of a Memorial Hall rather than a monument.



THE SLATER COTTON COMPANY'S MILLS, PAWTUCKET.

The mills of the Slater Cotton Company, situated on Main Street, nearly opposite the historic machine shop of James Brown, constitute one of the largest and most important industries in Pawtucket, and the leading product of its manufacture is known everywhere. It is to-day the only establishment in the direct line of manufacturing which Samuel Slater inaugurated in Pawtucket, and his name is very appropriately recognized in the title of the corporation. The company operating the mills was incorporated in 1869, and the old mill, originally used for a file factory, which is a part of the present plant, was purchased. At that time but 300 looms were in use. It was a two and one-half story building, 300 x 50 feet. The industry flourished, the need of larger accommodations became apparent, and three times there have been enlargements. In 1881–2 the new mill, one of the finest in the city, was erected. It is a substantial five story building 340 x 92 feet, and the best machinery in the market was placed therein.

The goods manufactured by the Slater Cotton Company consist of twills, sateens, fancy woven cloths, apron goods and the like, but its principal product is the "Pride of the West" cotton cloth, the finest and highest grade of bleached cotton produced. It is used largely in the manufacture of ladies' and children's underwear, and maintains to-day the high reputation which it was the ambition of the makers from the beginning to attain. The demand for the goods of this company has been manifest in a constant and steady growth in the production. From the original 300 looms the plant has grown to its present capacity of 1,475 looms. During the past year, under the direction of the treasurer, one of the mills has had another story added, permitting an increased capacity of 200 looms. This industry gives employment to 600 people, and nearly four million yards of cloth in the different grades are produced annually, using about three thousand five hundred bales of cotton.

The machinery in the works of this company has been carefully selected in order that the high standard of its manufactures should be fully maintained, and the products of the industry of Pawtucket are well represented. The plant consists of Potter & Atherton picking machines, Whitin and English revolving flat cards, Howard & Bullough electric drawing machines, Carter combers, City Machine Company speeders, both American and English mules, Fales & Jenks spinning frames,

Colvin and Whitin and new Stafford looms, a large portion of which are fitted with the Morton let-off. Each room is supplied with patent automatic sprinklers, for use in case of fire, and in the weaving room is an Aerophor air moistening machine—a German patent. The old mill contains a 325 horse-power Corliss engine, the new mill a Harris-Corliss of 600 horse-power and a Greene of 250 horse-power. In the different mills are Whittier, Robinson, and Babcock & Wilcox boilers. The rooms in both mills are lighted by electricity, the system in the old mill being the Waterhouse arc, and in the new the Edison incandescent.

Hon. William F. Sayles is president of the company, having held that position for many years, being also one of the original incorporators. C. E. Lindsey, the present treasurer, has been in this office since September, 1889. Mr. Lindsey has had a large experience in the manufacture of cotton, being originally with the American Print Works in Fall River twenty-two years, and afterwards connected with the Conanicut Mills in that city, of which he is treasurer at the present time. He was a member of the city government of Fall River for many years, and two years mayor of the city. V. T. Barber is superintendent of the works. The selling agents of the company are Coffin, Altemus & Co., New York, Boston, Philadelphia and Baltimore.

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The business of the Dunnell Manufacturing Company is conducted on the site of an old print works, and this has been the leading branch of industry in the present establishment from the beginning. The water-privilege belonged to the Bucklin heirs, and as early as 1817 it was purchased by Almy, Brown & Slater for the purpose of bleaching cotton cloth and yarns. Block printing was introduced in 1824, and after several changes the property was leased to Sibley & Kelley in 1830, who began printing under the style of the Franklin Print Works, continuing until 1836, when a partnership was formed between Jacob Dunnell, Thomas L. Dunnell and Nathaniel W. Brown, the immediate predecessors of the present corporation. This firm began business under the name of Jacob Dunnell & Company, using only two machines, which would print two and four colors. Jacob Dunnell was the moving spirit in the enterprise from the start, although he was without previous experience in the business. The plant grew and the production of the mill increased until the company was using ten machines, varying from four to ten colors. All the improved machinery for printing was introduced, new buildings were erected, the old bleachery and dye house was utilized until it became necessary to build a new one, and the industry is to-day one of the largest in Pawtucket, and is the only print works in the city.

In 1853 the firm became an incorporated company under the laws of Massachusetts, the property being in that state until the readjustment of the boundary line between Massachusetts and Rhode Island. In 1860 the company came under the laws of the latter state, and became a part of the industries of the town of Pawtucket. The company, as originally incorporated, continued until 1881, when Jacob Dunnell retired from the active management, still, however, retaining his interest, and his son, W. W. Dunnell, became treasurer, which position he retains at the present time. Five years ago a new bleachery was built and an entirely new plant for the finishing of white goods was put in. Since that time the dyeing and finishing of all kinds of cotton goods has been an important part of the business. Printing is still done, and the company is the largest in the vicinity doing what is known as job printing. In former years this work was done by the company on its own account, but for the past three years all the dyeing, finishing and printing has been done on account of other parties. In August, 1890, the establishment was visited by an extensive fire, which affected, however, only the printing department. Four new buildings are now in process of erection, with about the same capacity as the old mills. They will be fitted with new machinery and modern appliances, and the company will take the occasion to rebuild the old bleachery. The capacity of the establishment is the finishing of 50,000,000 yards of cloth annually, and about five hundred people are employed. Jacob Dunnell died in 1885, and his portion of the stock still remains in the corporation in the hands of trustees.

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The Greene & Daniels factory is one of the oldest enterprises in Pawtucket, and it is a question if the firm was not the first to make spool cotton in this country. It was one of the pioneers, at all events. Benjamin F. Greene, the father of the present president of the corporation, worked as second hand in a mill of 700 spindles for seventeen years previous to 1840. At that time with four other persons he leased a room 80 x 36, in Central Falls, and with 600 spindles began the manufacture of cotton yarn or thread. In 1845, he removed to Mapleville, R. I., where he had a larger mill, and in 1850 he again removed to Richmond, R. I., at which place he was running 2,000 spindles. That year, 1850, Horace Daniels was employed as book-keeper and assistant superintendent of the mill. Mr. Daniels was a practical man, and observed that Mr. Greene was selling his cotton yarn to people who were winding it on spools. Mr. Daniels suggested that Mr. Greene wind his own cotton, and put it on the market in this form. The business increased and in 1853 Mr. Daniels became a partner in the firm. In 1855 Mr. Greene decided to return to his old home in Central Falls, and the machines were transferred to the present location. About this time Mr. Daniels took out a patent for dressing the thread which became very popular, and the Greene & Daniels ivory finish spool cotton was sold everywhere. In 1860, an enlargement was made, and in 1865 it was necessary to repeat the operation, and at one time the firm was making 35,000 dozen per week of this celebrated cotton. In 1876, Mr. Daniels died, and July 1, 1877, the firm became an incorporated company under the name of the Greene & Daniels Manufacturing Company, with Benj. F. Greene, president, E. A. Greene, treasurer, and George P. Grant, agent. In

1886, Benj. F. Greene died, and the officers of the company became E. A. Greene, president, and George P. Grant, treasurer.

When General Daniels died, this spool cotton was being manufactured, and it continued till about ten years ago, when the use of the sewing machine brought the soft-finished six-cord threads, like the Willimantic and Coats, into more extended use. The ivory finished cotton of Greene & Daniels was a three-cord thread, and while it is still manufactured to some extent, the demand has been superseded by a different class of goods. But the production of cotton yarns and threads for manufacturing purposes has not been diminished at the works of this company. In 1876 the extent of the industry was 22,000 spindles; in 1890 it was 32,000. The company does bleaching and coloring, as well as the spinning of the yarn, and has done considerable coloring for the woolen people. Since 1876 and 1877 a specialty has been made of a high grade of yarns, in the different colorings, for ladies' dresses, and this grade of goods is sold to manufacturers for many purposes. Since that time there has been a complete revolution in the methods of manufacturing yarns, and the company has put in new machinery, using the English system of carding and combing. About four hundred people are employed, and all the yarn used for the manufacture of spool cotton from the outset has been spun at the mills.

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The works of the Conant Thread Company are situated on Pine Street—five large mills, with as many more smaller

EDWARD A. GREENE,

PRESIDENT OF THE GREENE & DANIELS MANUFACTURING COMPANY.

BENJAMIN F. GREENE,

FOUNDER OF THE GREENE & DANIELS MANUFACTURING COMPANY.

buildings—besides an office in a separate building, which has the appearance to the visitor more of an elegant mansion than the headquarters of a busy mart of industry. Mr. Hezekiah Conant, the originator of this enterprise, is still the managing spirit of the establishment, and takes just pride in the record which has been made. Prior to the establishment of the company, Mr. Conant had an experience of nine years with the Willimantic Thread Company, in Willimantic, Conn., and came here with the idea of establishing a similar industry in Pawtucket. An application was made for a charter by Mr. Conant, and several other gentlemen, which was promptly granted, and with a capital of $30,000, the manufacture of spool cotton began in a little mill on the premises occupied by the company to-day. This was in 1868. The same year Mr. Conant had an interview with J. & P. Coats, and easily convinced the English firm that great advantages would come from the manufacture of its thread here. In May, 1869, a new company was formed, and the manufacture of J. & P. Coats' six-cord spool cotton was begun in earnest, increasing from time to time until it has reached the mammoth proportions which make it the largest industry in Pawtucket. The necessities of the business caused the erection, in 1870, of a second mill, called Mill No. 2. In 1872 Mill No. 3 was built, in 1874 an additional wing of two stories was added to Mill No. 2, and a large store-house was constructed the same year. In 1875 Mill No. 4 was begun, to extend the spinning and twisting, the capacity of which was to be as large as the two previous mills put together. This mill was ready for occupancy in February, 1876, and the following year a dye-house and paper box shop were added. Since that time Mill No. 5, giving still further facilities for spinning and twisting, has been erected, and the entire works of the company cover at the present time an area of about forty acres.

The Conant Thread Company employs at the present time 2,200 people, two-thirds of whom are females. It has been the policy of the company from the outset to pay its employes sufficient wages to attract the best class of help, believing it for its interest to have efficient workmen. As a result, many of the employes live in houses which have been built by them from their weekly earnings, and large numbers of the working men and women reside in close proximity to the mill property, which is an exceedingly attractive place, and many of the residences bear evidence of excellent taste and prosperity. No industry that has existed in Pawtucket, since the time of Slater, has contributed more largely to the enterprise and business prosperity of the place.

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The bleachery of W. F. & F. C. Sayles, situated on the Moshassuck River, has developed alongside of the growth of the cotton industry in Pawtucket. Its founder, William F. Sayles, was born in Pawtucket, and after a mercantile experience of several years with Shaw & Earle of Providence he purchased the old Pimbly Print Works, on the site of the present establishment, and with little capital and no experience began the bleaching of cotton cloth. This was in 1847. The buildings were of wood, and were small, but the enterprise succeeded, and the following year, 1848, the bleachery was turning out a ton of cloth per day. From this time the growth was steadily forward, until in 1854, when the works were burned, four tons per day was the capacity of the bleachery. The fire took place in June and by autumn the works were rebuilt in a substantial manner, with a capacity for the bleaching of six tons of cloth per day. But this was inadequate to the demand, and in 1855 there was made another enlargement, and there has been a constant increase in the business until it is admitted to be the largest of its kind in the country. Ten years ago the capacity of the works was forty tons, or about three hundred and twenty-five thousand yards per day, and at the present time the product is much greater than that.

The establishment is situated on the Moshassuck River, in a beautiful location, and at an early period Mr. Sayles gave the name of this river to the bleachery, the name by which it is known at the present time. In 1863, F. C. Sayles, the younger brother of the founder of the bleachery, who had been in the constant employ of his brother after leaving school and had acquired a thorough knowledge of the various processes in the business, was admitted as partner. From that time the firm became known as it exists to-day, William F. attending to the finances, the contracts and the duties of general outside manager, and F. C. directing the local affairs and the details of the operations in the works.

The machinery and facilities of the bleachery of the Messrs. Sayles are of the highest order, and nearly fifteen hundred operatives find employment here. The firm owns the Lorraine Mill, which is also on the Moshassuck River, on Mineral Spring Avenue, and which in former years manufactured cotton goods, but has been recently engaged more largely on woolens, and both members of the firm have been prominently identified with leading banks in Pawtucket and Providence.

The manufacture of worsted braids, now one of Pawtucket's most important industries, was begun by Darius Goff and others in 1861, on the graduation from college of his eldest son, Darius L. Goff. The building occupied by Mr. Goff and his associates was the first worsted braid mill in this country, though Mr. Daggett, the manufacturer of the "Gold Medal Braid," commenced operations the same year. The industry was carried on in a small way until 1864, when Messrs. Goff & Son took the old stone mill on the site of the present location, where the business has increased until "Goff's Braid" is known in every part of the country. The manufacture of braid was not profitable at the outset, owing chiefly to the tariff laws, which at the time did not afford sufficient protection to the industry, and the works were run at a loss. But the tariff of 1867 enabled the firm to make and sell its goods at a profit, and the business developed rapidly from that time. Prior to the change in the tariff laws the firm was compelled to compete with a poor quality of English and German braid, and was at a disadvantage even then. Improvement in machinery and in the methods of manufacturing has brought competition in this industry, so that a much better quality of braid is made to-day by Messrs. Goff than was imported at the time of the lower tariff, and it is sold, also, at a less price. In 1872, Lyman B., the younger son of Mr. Goff, was admitted to the firm, the style being after that time, D. Goff & Sons, and the same year the large braid mill was erected.

In 1877 the firm made a change in the method of putting up the braid for the retail trade. Formerly it had been put up in the stick form so familiar to the housewife, but Darius L. Goff conceived the idea of rolling the braids and fastening the end with a clasp. The experiment was tried, and a patent obtained on the clasp for fastening braid. It was predicted by other manufacturers that this style of putting up would be a failure, but the demand for this form was instantaneous from retailers, and other makers hastened to follow the method devised by Mr. Goff. They could only imitate this braid by using a staple to fasten the end. They could not use the clasp patented by Mr. Goff, but permission was granted to one party in a different business to use it. In the manufacture of its goods the firm has always been alive to the interests of the consumer — determined that the article bearing its name should be the best that could be made. The braids have attained and maintained their reputation on the merits of the goods. "Goff's Braid" is sold directly to the trade, and always has been, and the house is represented with a stock of goods in Chicago, Philadelphia, St. Louis and San Francisco.

In 1882 Messrs. Goff & Sons began the manufacture of mohair plushes for upholstering car-seats — goods which had never before been made in this country or in England. It was a difficult fabric to produce, and at the beginning a competent and reliable man was sent to France and Germany to investigate the methods of manufacture and purchase some machinery. After many weeks, failing to obtain any information of practical value —the methods of manufacture being kept secret in these countries — he returned, Messrs. Goff began experi-

ments in the braid mill, and succeeded in working out the problem. After five years of persistent labor and thought, plushes were turned out equal in every respect to the best French goods. It is with these that the firm has been obliged to compete, and has done so successfully, obtaining a share of the trade on the merits of the plushes. Since American plushes were placed on the market foreign manufacturers have reduced prices, varying from twenty to thirty per cent. — the object being to force the American plushes out of the market. But the new tariff has afforded an additional protection to the manufacture, and beyond doubt this industry will be an important one in this country and to Pawtucket. The works of Messrs. Goff are run entirely by water-power— being the last privilege on the Blackstone River, with a fall of seventeen feet. There are four turbine wheels, and everything connected with this power is in the finest shape that it can be put by the skill of the mechanic. The plant is heated by steam and is lighted by electricity, using the Edison incandescent system, the dynamo being driven by water-power. The buildings are all of brick, and for protection from fire there is a five-inch stand pipe running to the roof, with a pressure of one hundred pounds to the square inch. About five hundred people are employed in this establishment.

In 1884 the entire business was incorporated with a capital of $600,000: D. Goff, president; D. L. Goff, treasurer and general manager.

DARIUS GOFF,

OF THE FIRM OF D. GOFF & SONS, PAWTUCKET.

Mr. Darius Goff, to whose enterprise and foresight Pawtucket is indebted for this industry as well as that of the Union Wadding Company, is now over 80 years of age. He can be found at the braid works almost any pleasant day, and though the active duties pertaining to the establishment have been assumed by his son, he is thoroughly interested in anything that will encourage American productions or bring prosperity to the city of Pawtucket.

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The Littlefield Manufacturing Company, which succeeded to the firm of Littlefield Brothers, is one of the successful industries of the city, and the plant has been in operation many years. Littlefield Brothers became the successors of David Ryder & Company in 1851, by the retirement of Mr. Ryder, and continued until July 1, 1889, when George L. Littlefield retired and an incorporated company was organized, with A. H. Littlefield, president, Eben L. Littlefield, treasurer, and A. H. Littlefield, Jr., secretary. The mill is situated on the west side of the river, in the rear of the Manchester Block, the main building being 130 x 48, four stories high, with an ell three stories high, 105 x 30. The product of the mills consists of cotton yarns for hosiery purposes, skein cotton and three-cord thread for spools. The manufacture of hosiery yarn is an important and growing enterprise, very few of the hosiery men spinning the yarn which is used, but purchasing it of such concerns as the Littlefield Manufacturing Company. A very fine grade of yarns is made by this company, and the goods have always found a ready market, which has been largely on the increase during the past three years. About one hundred and fifty operatives are employed, and the capacity of the works is 7,000 spindles. The office of the company is in the brick block of the corporation on North Main Street.

A. H. Littlefield, the president of the company, is a descendant of one of the old families of the state, that settled at New Shoreham, Block Island, in 1721, and became prominent in public life. In 1861, Mr. Littlefield was appointed division inspector of the Rhode Island militia, with the rank of colonel, holding that office five years. He was representative to the General Assembly from the town of Lincoln in 1876-77, and senator in 1878-79. He was governor of Rhode Island in 1880-83.

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Among the variety of industries which go to make up the business life of Pawtucket the establishment of P. E. Thayer & Company, manufacturers of all kinds of brushes, is deserving of an especial place. The business carried on by the present proprietors was started in 1860, in Attleboro', Mass., by George F. Green. Mr. Green died in 1865. His brother Thomas continued the industry, removed to Pawtucket, and sold out to Thayer Brothers, the immediate predecessors of the present firm, in 1870. The business continued under the name of Thayer Brothers until 1880, P. E. Thayer, its present

GEO. L. LITTLEFIELD,

FOR MANY YEARS OF THE FIRM OF LITTLEFIELD BROTHERS, PROMINENT MANUFACTURERS OF PAWTUCKET.

proprietor, becoming one of the firm in 1873. One hundred and sixty kinds of brushes are made solely for mills, print works and jewelers. In 1880, Mr. Thayer, who had become sole proprietor, changed the name of the firm to P. E. Thayer & Company, and April, 1886, purchased the Aquila Cook Brush Works, in Woonsocket, one of the oldest in the state, taking his nephew, Walter S. Thayer, in partnership in the Woonsocket part of the business. Improved machinery has made the manufacture of this class of goods an easier process than in former years, and large orders can be filled at very short notice. The factory in Pawtucket occupies 12,000 feet of floor room, and about fifty people are employed in Pawtucket and Woonsocket. Mr. P. E. Thayer, the senior member of the firm, was one of the centenary committee at the time of the celebration, and has been a member of the city council since the incorporation of Pawtucket as a city. In 1890 he declined a re-election. The works in Pawtucket are situated at 34 East Avenue.

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Robert D. Mason, who is now serving his eleventh year on the Board of Water Commissioners of Pawtucket, is one of the prominent business men of the city. He was born in Pawtucket, and at the age of 18 years went to work for his uncle in his bleaching and dyeing establishment, in the same place where he and his son are now located, under the firm name of Robert D. Mason & Company. The business conducted by this firm was started as early as 1805 by Mr. Barney Merry, the grandfather of Mr. Mason. Mr. Merry died in 1847, and was succeeded by his son, Samuel. In 1866, Mr. Mason, who had been employed most of the time by his uncle, was admitted as a partner in the firm, which became S. Merry & Company. In 1870, Mr. Merry retired and Mr. Mason carried on the industry, adopting the firm name of Robert D. Mason & Company. In 1889, Mr. Mason's son was admitted, the style of the concern remaining the same.

The spot on which the establishment is situated is a historic one, the old house of Samuel Slater being in close proximity, and Mr. Merry's house being in front of the shop of Mr. Mason. Slater and Merry were thus neighbors in olden time. The old shop where Mr. Merry carried on dyeing and bleaching has been enlarged, the increasing demands upon Mr. Mason rendering improvements necessary. The business carried on by the firm includes the dyeing and bleaching of all kinds of threads and yarns, knitting cotton, tapes and the like, and a specialty is made of analine and fast black dyes. Within five years the industry of this firm has materially increased, and the reputation of Messrs. Mason is very high. About seventy people are employed. The works are on East Avenue, almost directly in the rear of the old Slater house.

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The Fales & Jenks Machine Company dates back to 1830, when David G. Fales and Alvin Jenks formed a partnership whose reputation has come down to its successors of the present day. One of the earliest products of the shop, which was then in Central Falls, was the Hubbard rotary pump. Later there were made ring spinning frames and ring twisters — the first in this country. Warp and filling spinning frames, wool twisters, thread winders, force pumps, Howard & Bullough drawing frames, and various other kinds of machinery used in the different processes of the manufacture of cotton are made by this company. In 1856, Alvin Jenks died, and a few years later David G. Fales retired, when John R. Fales, son of the elder Fales, and Alvin F. Jenks and Stephen A. Jenks, sons of the elder Jenks, became the successors of the old firm, still retaining the name, and in the fall of 1863 the building now occupied by the company was begun. Since that time many enlargements have been necessary and nearly six hundred people are employed by the company. Both Stephen A. and Alvin F. Jenks are interested in many other enterprises, and have contributed in a variety of ways to the material and lasting prosperity of Pawtucket.

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The old Sprague Mills, in Central Falls, is occupied by the United States Cotton Company, of which Alvin F. Jenks is president and Stephen A. Jenks treasurer. This company purchased the old mills of the Sprague

concern in 1883, starting up in November of that year and running seven months, when an entire change was made, and more modern machinery was introduced. The product of this manufactory is largely print-cloths and what is known to the trade as "off goods," being different widths of sheetings and shirtings. About six hundred and fifty operatives find employment here, and the industry is one of the most important in Pawtucket. The mill is run by a Harris condensing engine of 1,325 horse-power, the water for the condenser being pumped by electricity, the dynamo being in the engine house and the motor in the pumping house, on the bank of the Blackstone River, 700 feet distant from the mill.

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The works of the Union Wadding Company, situated on Weeden, Pine and Dexter streets, covering an area of territory of from four to five acres, are the legitimate outgrowth of the first business venture of Mr. Darius Goff in his native town of Rehoboth, Mass. In 1835 Mr. Goff purchased a cotton mill in that town and began the manufacture of cotton wadding, extending the industry to glazed wadding, which in the early days had to be sized by hand a single sheet at a time. This primitive method was soon superseded by the efforts of Mr. Goff, the business there greatly increased, and in 1847 he removed to Pawtucket and purchased the estate which is the site of the present establishment. Here was erected a large wadding mill which was run by steam, and

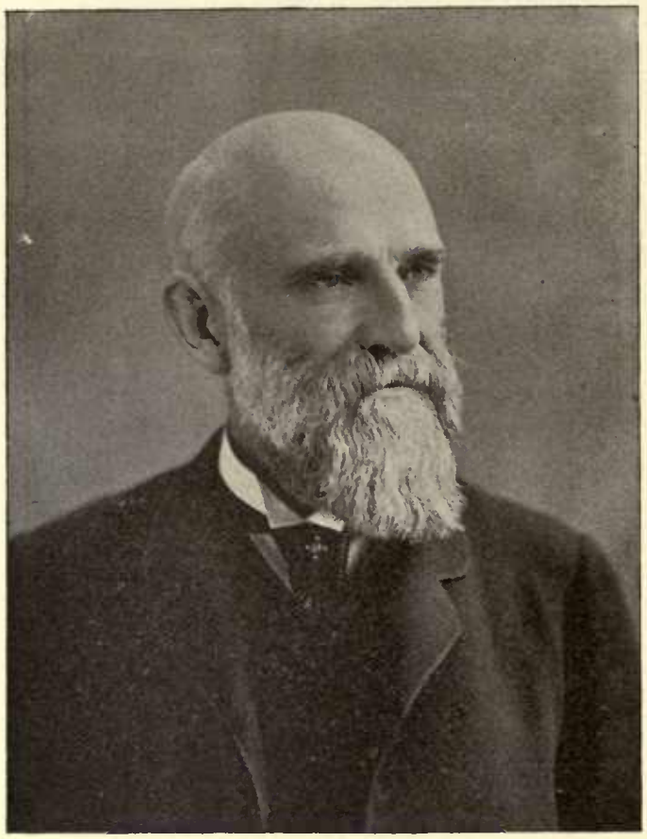
PHILO E. THAYER,

OF P. E. THAYER & CO. OF WOONSOCKET AND PAWTUCKET.

ROBERT D. MASON,

OF THE DYEING AND BLEACHING HOUSE OF ROBERT D. MASON & COMPANY, PAWTUCKET.

enlargement after enlargement followed until at the present time the business aggregates $2,000,000 annually. It is not, however, devoted entirely to the manufacture of the different grades of cotton wadding, but includes a large trade in cotton waste and paper stock. Mr. Goff was very early in life engaged in the buying and selling of this stock. In 1836 his attention was drawn to the fact that a share of the material used in the cotton mills was thrown away, and at that time he made a contract with the Lonsdale Company to purchase all the refuse cotton stock which the company could not use in the manufacture of its goods. Since that time, for fifty-four consecutive years, this contract has been renewed with Mr. Goff, and the bills of the Lonsdale Company have amounted, some years, to over one hundred thousand dollars. The cotton waste sold by the Wadding Company finds a market in England and Germany as well as in this country, and is such an important part of the industry that the making of cotton batting, which was the original idea of the projectors, amounts to but one-sixth of the business carried on by the company at the present time. In 1860 the firm of Goff, Cranston & Brownell was formed for carrying on a general traffic in paper stock and wadding in Providence, and continued until 1880, when this firm and that of the company carrying on the wadding mill in Pawtucket was merged into one, and became the Union Wadding Company as it exists at the present time. The capital stock, which was originally $200,000, has been increased from time to time until it is now $1,000,000, and this stock is held largely



HENRY A. STEARNS,

OF THE UNION WADDING COMPANY.

by the Messrs. Goff, though some of it has been taken by southern parties. The officers are: Darius Goff, president; Lyman B. Goff, treasurer; Henry A. Stearns, superintendent. The company has a plant in successful operation in Augusta, Ga., of which Mr. George R. Stearns, son of H. A. Stearns, is treasurer, and owns half interest in one in Montreal, Canada, which is under the supervision of a nephew and a son of Mr. Stearns. The works of the company are twice the size of any wadding manufactory in the world, and some four hundred persons are employed.

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Henry A. Stearns, who is superintendent of the Union Wadding Company's Works in Pawtucket, and one of the largest stockholders in the company, has been connected with the manufacture of cotton wadding since 1846. In fact but few years intervened between the starting of the original plant of the Union Wadding Company by Darius Goff and that of Mr. Stearns in Cincinnati, Ohio. Both were pioneers in a business which has had a remarkable growth since that time. Mr. Stearns is a Massachusetts man. He was born in the town of Billerica, October 23, 1825, and his father, Captain Abner Stearns, who invented the first machine for splitting leather in the country, was a soldier in the war of 1812. Mr. Stearns' parents died when he was twelve years old, and the young man, whose father had left him sufficient money to acquire a limited education, went to Andover, Mass., Academy for two years, taking an English course. At the end of that time, he was obliged to depend upon his own resources, earning his living as best he could in shoemaking and in the shop until he was 20 years of age, when he decided to try his fortune in the West. In 1846 he found himself located in Cincinnati, where he established the first manufactory of cotton wadding west of the Alleghanies. At first he did business alone, but afterwards associated himself with Mr. S. C. Foster, under the firm name of Stearns & Foster. Mr. Stearns had no experience in the business at the outset, but it grew and prospered, and in 1850 Mr. Stearns sold out to his brother, George S. Stearns, and the industry, as an incorporated company, called the Stearns-Foster Company, is continued in Cincinnati at the present time, 1890. In 1850 Mr. Stearns resolved upon a new enterprise. Gold had been discovered in California and explorers were hastening thither. Mr. Stearns conceived the idea that a steam laundry in that region would be a profitable investment, and decided to purchase the necessary machinery and ship it to California. This he did in Cincinnati and sent it down the Mississippi and over the Gulf to Chagres, thence across the Isthmus. The boiler had to be carried overland to Panama by squads of men, and at Panama Mr. Stearns embarked for San Francisco in an old whaler, which sprung a leak, came near foundering and floated around on the ocean for four months. Mr. Stearns started April 2, 1850, from Cincinnati, and it was five months before he landed in San Francisco, so ill that his physicians gave little hope of his recovery. He regained his health, however, set up his machinery and established the first steam laundry in California. In 1851 Mr. Stearns sold out his share in the laundry, and purchased an interest in a steamboat, running the first steam ferry between San Francisco and Oakland, which is now one of the largest cities in California. He ran this ferry but a single summer, during which time he was also engaged in the cattle business, when he started a saw mill and store in San Jose. He cut down the redwood and made it into lumber for dwellings. He continued in this business until 1853, and returned to Cincinnati, re-embarking in the cotton wadding business with his former partners. Here he remained until 1857, during which time, June 26, 1856, he married Kate Falconer, daughter of J. H. and Charlotte Smith Falconer, of Hamilton, Ohio. His health being poor, he decided to locate in Buffalo, New York, and finding a partner, he engaged in the manufacture of hardware, when the financial crisis of 1857 came, and Mr. Stearns lost nearly all his property. He removed to Sangamon County, Illinois, started a saw mill and store, and January 1, 1861, he came to Pawtucket, associating himself with Mr. Goff in his old business. The industry at that time was small, but by the united efforts of Messrs. Goff and Stearns it rapidly increased. Mr. Stearns invented several appliances for facilitating the work of manufacturing which proved of great value, and he took out, also, patents on railway safety gates, cotton gins and the extraction of oil from cotton waste. The business of manufacturing wadding was continued as a partnership until the incorporation of a stock company in 1871. Mr. Stearns very shortly took up his residence

in Central Falls, and represented the town of Lincoln in the lower branch of the General Assembly from 1878 to 1881. He was chosen Senator for the years 1881–'84, and again in 1887–'88. He served as chairman of the committee which introduced the water service into the town, and during his term in the General Assembly he was appointed by Governor Davis a member of the committee to investigate the public institutions of the state.

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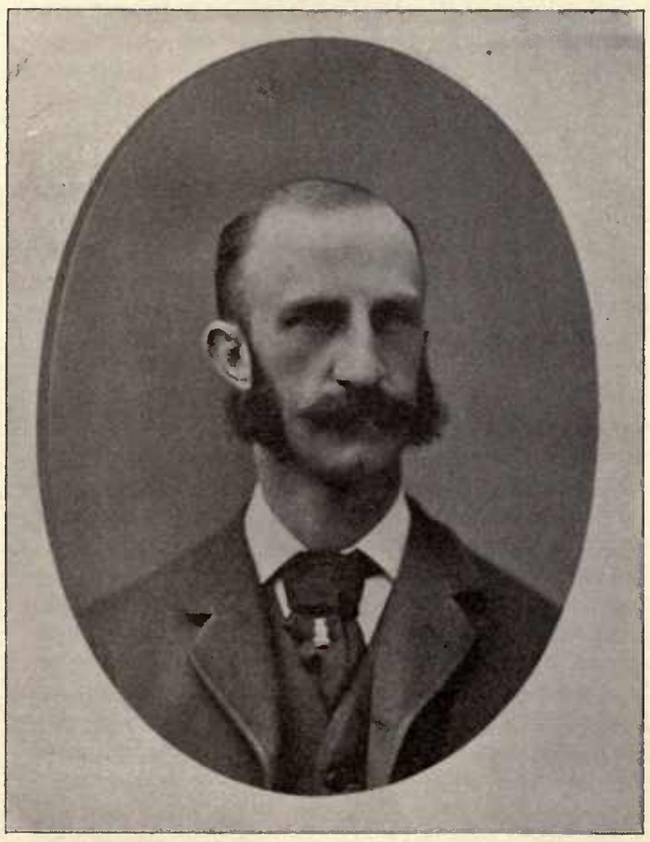
Not only is the plant of the Stafford Manufacturing Company, in Central Falls, one of the oldest in the vicinity, but John A. Adams, its present president, is the oldest living manufacturer in the line of the cotton industry in Central Falls. He was born in North Kingston, R. I., January 20, 1815, and began work on a farm at the age of 12 years. During this time he obtained a further education in private schools. At the age of 18, he entered a cotton factory in Franklin, Mass., determined to master every detail of the business. This he was able to accomplish, and in 1837 he came to Central Falls. Here he found employment in the different manufactories, and he takes pride in stating that he has worked, at some time, in every one of the old mills on the stream. Here he manifested so much skill and sagacity that he attracted the attention of a capitalist, who took him into business, and Willard & Adams began the manufacture of yarns and thread in 1842. This partnership continued three years, when Mr. Adams associated himself with Joseph Wood and others in the

JOHN A. ADAMS,

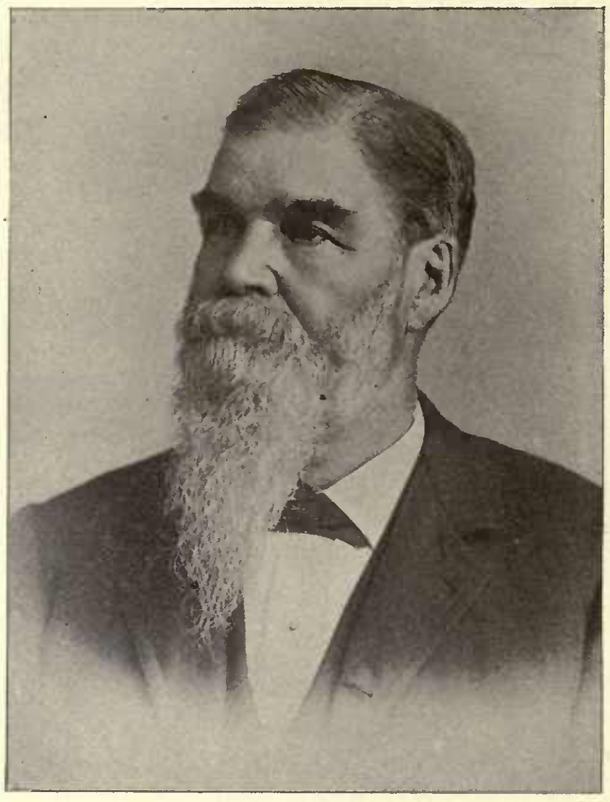
PRESIDENT OF THE STAFFORD MANUFACTURING COMPANY.



STEPHEN L. ADAMS,

TREASURER OF THE STAFFORD MANUFACTURING COMPANY.

manufacture of cotton goods. In 1848 two of the partners died, and the firm became Wood & Adams, continuing until 1863, when the mill was sold to the Pawtucket Hair Cloth Company. The firm of Wood & Adams then transferred its capital to the business which had been conducted for many years on the site of the present plant. It is a very old mill, having been built in 1824 by John Kennedy, who ran it for seven years, and after many vicissitudes the property was purchased by Rufus J. Stafford and Henry B. Wood. Mr. Wood's interest was shortly after purchased by Mr. Stafford, and his brother was associated with him under the firm name of Stafford Bros. The business increased, the stone mill known as the Jenks Mill was purchased, and the manufacture of spool thread, known as the Stafford cotton, was carried on extensively. In 1863, Rufus J. Stafford died, and the business was taken by Wood & Adams, who obtained control of the property, and became an incorporated company in May, 1864. The corporation became known as the Stafford Manufacturing Company, and has continued under this name until the present time. Upon the incorporation of the company the old brick mill was enlarged to nearly double its former capacity, and the Jenks Mill was also used until last year, when it was abandoned and the industry consolidated in the brick mill. Within the past few years entirely new and modern machinery for the making of thread has replaced the old — machinery which will do the work quicker, easier and enable the company to compete with other



DANIEL G. LITTLEFIELD,

PRESIDENT OF PAWTUCKET HAIR CLOTH COMPANY.

thread manufacturers. There has been, in this as in other spool cotton plants in the country, an entire revolution in the method of making the thread, and the product of the Stafford Company is used very largely for manufacturing purposes. The thread made is mostly two and three ply, and while there is considerable trade for the spool cotton put up on 200 and 500 yard spools for domestic use, the larger portion of the industry consists in the making of the thread in long lengths put up in any desired form for the use of the manufacturers. A larger business is done than ten years ago, and at the present time about one hundred and twenty-five people are employed. The company runs 12,550 spinning spindles — less by 3,000 than three years ago, but more yarn is obtained from the present number owing to the improved machinery — and uses 5,000 twister spindles. The dyeing of the yarn is done by outside parties. The product of the mills is sold largely in the markets of New York and Philadelphia.

During the life of Mr. Wood, Mr. Adams acted as agent and a portion of the time as president. Mr. Wood died in 1873, and Mr. Adams, being the sole remaining partner, became treasurer also. He is now president of the corporation. Mr. Adams married, in 1836, Sallie M. Crowell, by whom he has had eight children, only two of whom, John F. and Stephen L., are now living. He became a member of the Central Falls Congregational Church in 1848, and was for six years a member of the town council of Lincoln. He represented the town two years each in the house and senate in the General Assembly of the State. He is at the present time a trustee of the Franklin Savings Bank and a director in the Slater National Bank of Pawtucket.

Stephen L. Adams, who is a son of John A. Adams, the president of the Stafford Manufacturing Company, was born in Central Falls, November 25, 1849. He received a good education in the public schools of his native place, continuing a course in the well-known academy of Mowry & Goff in Providence. Not being in good health at the completion of his studies, he traveled for some years quite extensively. Returning from his travels he located in Boston, Mass., in the dry goods business, until January, 1882, when he returned to Central Falls, entering the office of the Stafford Manufacturing Company, as book-keeper. In this position he became acquainted with the details of the business carried on by the company, in the mastery of which he was an apt student, and in March, 1889, he was promoted to be treasurer of the company, which position he holds at the present time. The present officers of the company are John A. Adams, president and agent; F. A. Horton, secretary; Stephen L. Adams, treasurer. During the recent illness of his father, Mr. Adams has had the entire charge of the management of the affairs of the company.

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The industry of the Pawtucket Hair Cloth Company, for the manufacture, from horse hair, of a cloth which has been used largely in past years for furniture covering, is one of the most important in Pawtucket. In 1857 and 1858 a few machines were set up for weaving crinoline, and the originators speedily found help among the citizens of the place. A company was organized in 1861, composed of the following gentlemen: David Ryder, Olney Arnold, George L. and A. H. Littlefield and Dr. J. M. Ryder. Operations were begun in the old Slater Mill, and the intricate machinery in use in the factory, and which has produced such remarkable results, is the invention of Isaac Lindsley, of Pawtucket. Mr. Lindsley was a jeweler and of an inventive turn of mind, and his attention was called to the former method of supplying the single hair to the loom by hand to produce the hair cloth. He conceived the idea of a machine which should automatically select the single hair from the mass; so locating the mechanism in connection with other parts of a power-loom, as to present the hair in and to the loom. After many years of experimenting, this was successfully accomplished. In the production of hair cloth the selection of the hair and its proper presentation to the loom is absolutely essential. When this does not happen the production is temporarily suspended, and the notched lance devised by Mr. Lindsley secures the single hair from a bunch of horse tail hair, and presents it properly for the production of the cloth. To this invention is due a large portion of the success of the Pawtucket Hair Cloth Company. The business was carried on in a small way until 1863, when Daniel G. Littlefield, at the earnest solicitations of the representatives of the company, came to Pawtucket to undertake the work of perfecting the machinery and working with Mr. Linds-

ley to build up the industry. At that time, after an experience in the manufacturing business that began at an early age, he was president of the Florence Sewing Machine Company, in Florence, Mass., besides being interested in other manufacturing industries. Mr. Littlefield proposed remaining but a single year, but his valuable experience was recognized, he became interested in the industry, and the following year the company was reorganized, and under his direction the plant was enlarged and the fine brick building, at present occupied by the company in Central Falls, was built. All the machinery was set under his direction, the business prospered, and to Mr. Littlefield's enterprise a large share of that prosperity is due. He visited Europe several times in the interest of the company — in 1865, and again in 1866, 1868, 1871 and 1872, each time obtaining information of benefit to the business, and making the plant the most complete of any of its kind in the world. At the present time, although the demand for the production is not as large as it has been in years past, this company makes nearly all the hair cloth produced in this country, there being not 100 looms running in other parts of the continent, while the capacity of the Pawtucket Hair Cloth Company is 400 looms, and a good business is still carried on.

THE PAWTUCKET HAIR CLOTH COMPANY'S MILL.

Mr. Littlefield has had a long and varied experience in manufacturing industries. He was born in North Kingstown, R. I., November 23, 1822, and at the early age of 8 years he began work in the Jackson cotton factory in the town of Scituate, where his parents then resided. Even as a boy he became interested in the development of the industry, and resolved to master every detail of the business. From bobbin boy he became second-hand, overseer and superintendent, and in 1846, he went to the small village of Florence, and assisted in starting a cotton mill. Later he went to Northampton and engaged in the dry goods business, and afterwards to Haydenville and assisted in establishing a cotton mill for Hayden & Sanders. After two years here, he started a country variety store in that place, where his business was one of the largest in the vicinity. Disposing of his country store, he became salesman and agent for Hayden & Sanders, selling the goods of this firm in New York and other large cities. In 1856, he returned to Florence, where he engaged in the manufacture of sewing machines, and became president of the Florence Sewing Machine Company. Here he remained until 1863, when, as stated, he came to Pawtucket, and since that time has been actively identified with the Hair Cloth Company. During his residence in Massachusetts he was chosen representative to the Legislature in 1861 and 1862 — during the Civil War. In 1878 Mr. Littlefield went to Paris as honorary commissioner from Rhode Island to the exposition, having been appointed by the United States, on the recommendation of Governor Van Zandt. On his arrival he was appointed by Commissioner General McCormick an American juror of Class 58, which included small and fine machinery of all nations. Mr. Littlefield is a republican in politics, was lieutenant-governor of Rhode Island for the year 1889, and is president of the republican club of the town of Lincoln. He is also president of the Providence County Savings Bank, and has been president of the Business Men's Association of Pawtucket for two years. Within a few years, in the same building with the Pawtucket Hair Cloth Company, the Royal Weaving Company, seven-tenths of whose stock is held by the Hair Cloth Company, has been manufacturing silk and cotton mixtures of different varieties. Some very attractive goods are made, and a new building, for the enlargement of this business, is being erected in close proximity to the works of the Hair Cloth Company.

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The possession of a well equipped and ample water service, for domestic, manufacturing and fire purposes, is one of the leading advantages of the city of Pawtucket,

EDWIN DARLING,

SUPERINTENDENT OF PAWTUCKET WATER WORKS.

and to Edwin Darling, more than any man, is due the credit of the present admirable system, recognized by all whose experience has led to investigation, as second to none in this country. Mr. Darling is an enthusiast over the service, and has devoted the best years of his life to the establishment of a system which promises to be a constant blessing to the inhabitants of the city. Mr. Darling came to Pawtucket when he was twenty-one years of age. He was born in Bellingham, Mass., where he received the advantages of a good common school education. Until 1878, during his residence here, he was engaged in the provision business, when he was called by his fellow citizens to the work in which he has since been engaged. A board of water commissioners had been appointed for three years, for the purpose of constructing the water works in the city. At the end of two years there was a change in the board and Mr. Darling was appointed commissioner for the remaining year. He entered upon his duties with characteristic energy, carried the original system to its completion, within the time limited for the construction of the works, furnishing Pawtucket with twenty-six miles of pipe, and extending the service to Central Falls. April 2, 1880, the entire works having been completed according to the original design, a new board of commissioners was appointed and Mr. Darling was chosen superintendent, taking at once entire charge. He made a thorough investigation and became convinced that it was for the interest of Pawtucket to extend its water service into the surrounding towns. To be assured of this fact with Mr. Darling was to act at once, and the same year the Watchemoket fire district was supplied with water, and the following year the towns of Cumberland and Lincoln. The extension of the service to Berkeley and Ashton was accomplished within a few years, and with these extensions came a demand for larger facilities for supplying the needs of the citizens in all these places. Pumping Station No. 2 was built, together with the large storage reservoir at Cumberland, then the dam at Happy Hollow and Pumping Station No. 3. The revenue has largely increased, fully justifying Mr. Darling's predictions at the outset, so that the cost of the maintenance, including interest, is at the present time fully met, with the further addition of some seventy thousand dollars to the sinking fund. The system of water works thus established by Mr. Darling has a reputation beyond the limits of the service, and the superintendent is often called upon for advice in matters pertaining to the water departments in other cities and towns.

Mr. Darling's service to Pawtucket is not, however, confined to the water works, although this alone would render him conspicuous among the leading men of the city. But he has been interested in other improvements of a public nature, and contributed largely to their furtherance. He served the town in the General Assembly four years, from 1867 to '70, and later, in 1874. In the year 1869, the third year of his service in the House, a law was passed abolishing the tolls on the turnpike roads in the state, and Mr. Darling was appointed commissioner with full power to put them in proper condition for use, or to make them free. The tolls were abolished in every case, with a single exception. The freeing of the Pawtucket turnpike, now called Pawtucket Avenue, which took place April 24, 1869, was the occasion of general rejoicing. The ceremony was performed by Mr. Darling, who alone had the power at this juncture, and it was attended by the town council and a large concourse of citizens. Mr. Darling paid the last toll, a silver quarter, to the toll-keeper, the sign was torn down, and the freedom of the road was accomplished amidst great cheering. Mr. Darling was also interested in the rebuilding of what is known as the old Red Bridge, which greatly improved navigation in Pawtucket River. He was also appointed one of the board of commissioners to erect the Providence county court-house, and this commission received a vote of thanks from the General Assembly, an exceptional occurrence, for its honesty and for the completion of the work within the appropriation. Mr. Darling was a member of the old town council, and was also one of the commissioners who built the Exchange Street bridge — this also being completed within the appropriation. This Mr. Darling believes to be one of the essential qualifications of public service, wherever there are proper facilities for estimating the cost at the beginning. Mr. Darling was largely instrumental in inducing the New York, Providence & Boston Railroad Company to erect a freight depot in the eastern portion of the city, which is being done, and which will be for the advantage, mutually, of the city and the railroad. For the past three years he has been a member of the school board, declining a reëlection for the ensuing year. During this time he was chairman of the building committee which erected the Church Hill and the Grove Street school-houses — two of the finest in the city.

The business now carried on under the style of the Lebanon Mill Company is situated on Broad Street, a short distance above the railroad depot. The mill formerly occupied by the company was burned in February, 1888, and Mr. Edward Thayer, who is now at the head of the enterprise, was compelled to seek quarters in the present location. The mill which was destroyed by fire was a large four story building situated in Lebanon, a part of Pawtucket. It was erected in 1858–9 by Messrs. Alanson Thayer and R. B. Gage on the site of an older mill, called by the same name, which had been burned to the ground. In 1866 Mr. Gage retired, and Messrs. Alanson Thayer and his son Edward took the mill, the firm being called Alanson Thayer & Son. The elder Thayer died in 1868, and the son succeeded to the business, which he has continued to the present time.

The Lebanon Mill Company sells all kinds of cotton yarns, for hosiery or other purposes. Before the mill was burned it manufactured these yarns, but Mr. Thayer is interested in several manufactories, whose yarns he sells to the trade. Since moving to the present quarters Mr. Thayer has added the manufacture of rubber linings, jersey cloths, dress shields, corset cloths, and knitted fabrics of various kinds. This industry is a growing one, and Mr. Thayer has in contemplation the erection of a building for the production of this class of goods on a larger scale. About fifty people are employed at the present time.

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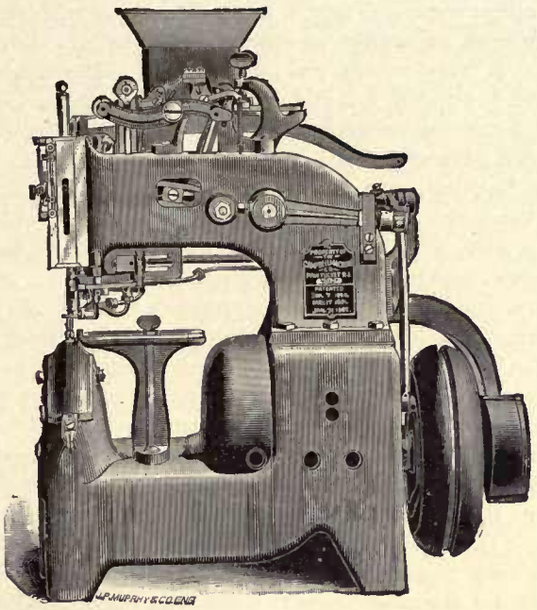
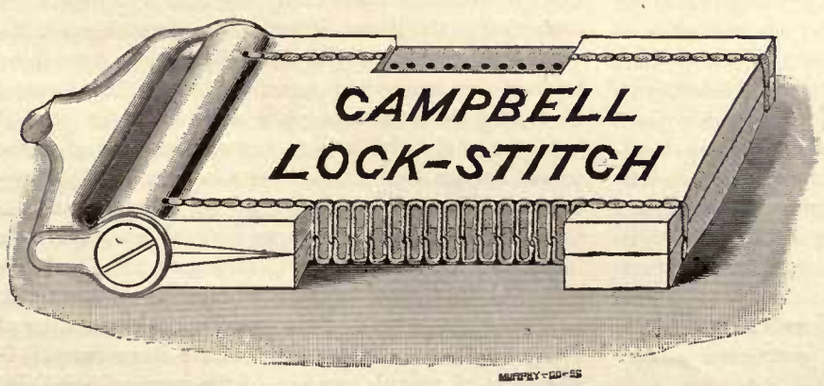
The Campbell Machine Company, whose works are situated on Bayley Street, was organized in 1880, with a capital of $500,000. The principal product of its works is a lock-stitch wax-thread machine, the invention of Duncan H. Campbell, for use by shoe and harness manufacturers, and which accomplishes what no other machine has been able to do. There have been innumerable lock-stitch machines, and machines which could use a wax-thread, but a satisfactory combination of the two, producing results that could be previously attained only by hand, had not been secured until this invention of Mr. Campbell. All the wax-thread machines that have been made in years past have been of the chain stitch variety, and the work which they produced was of very inferior quality. It could scarcely be otherwise. In ordinary machine sewing, the chain stitch has been mainly superseded, because of the fact that when one stitch has broken the entire seam can be pulled apart. In all sewing machine product this has been a serious objection, and in the use of wax-thread machines for shoes this stitch has been tolerated only because no machine, until this invention of Mr. Campbell, had come on the market that could unite the wax-thread with the serviceable and desirable lock-stitch. But now that it has come, and is producing satisfactory results, the demand both in Europe and our own country has been very great. The machine is as desirable for harnesses and heavy belting as for shoes, and as far as the work is concerned, it is preferable to hand-sewing, because of the absolute uniformity in the puncture of the holes, the powerful and even tension by which the stitches can be drawn, and the similarity and handsome appearance of the seam on both sides. In the sewing of leather or kindred material one of the essential requisites is that the holes made by the awl or needle should be solidly filled with thread. This is done in the most perfect manner by the Campbell machine, and when to this is added the fact that the entire top of the stitch, as shown in the annexed engraving, may be worn or even cut away without impairing its solidity, it can be readily seen that the Campbell machine presents points of superiority that can be claimed for no other machine on the market. As at present arranged the machine can stitch soles of the lightest grade of women's boots, or the heaviest harness tugs, and it can work from very thin to very thick work by absolutely automatic adjustment, without any loosening of the stitch. As will be seen by the picture, the machine can be placed on a common work bench, and occupies about the same space as other sewing machines. A skillful operator can



CAMPBELL LOCK-STITCH WAX-THREAD SEWING MACHINE.



ENLARGED VIEW OF THE CAMPBELL LOCK STITCH.

run it at a speed of 400 or more stitches per minute, and any man or woman of ordinary capacity can learn to use it very readily and successfully. The machines have been very favorably received in Europe, Daniel McNiven, the secretary of the corporation, having established a branch of the business of the company at Leicester, England.

While the Campbell machine is the specialty of the company, which was formed primarily for its manufacture, machinery of the finest grades, along other lines, can be made at the company's works. A very intricate machine for the knitting of irregular shapes and intended for the use of hosiery and underwear manufacturers, was on exhibition in Pawtucket during Centenary week, and was built in the factory of the Campbell Machine Company. The officers of the company are George B. Champlin, of the firm of S. B. Champlin & Son, Providence, president; Henry B. Metcalf, treasurer; Daniel A. McNiven, secretary. Mr. Metcalf, who has been treasurer of the company from the start, has been for the past twenty years the commercial man of the Pawtucket Hair Cloth Company, and for the last six months has been manager of the Campbell Company, devoting his entire time to the furtherance of its interests, which are becoming more important each day. Mr. Metcalf is also interested in the Boston Button Company, of Boston, and is one of Pawtucket's best known, most honorable and successful business men.

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The *Daily Evening Times* is one of the institutions of Pawtucket. It has had a remarkable growth from the beginning, and its circulation among the Valley villages, as well as in the city, is steadily increasing. It was established April 30, 1885, as a four page paper, and the demand for such a newspaper was apparent at once. It was enlarged October 12, 1886, November 1, 1887, October 20, 1888, and was purchased March 20, 1890, by the Times Publishing Company. The paper was at once changed by the new management into an eight page, six column sheet, and an entirely new plant put in at an expense of $35,000. The office was removed from its old location to the present quarters in Read's Block, where its facilities in the editorial room, the composing and press room are fully equal to that of any office in the vicinity. The press and shipping room are in the basement, where can be seen a Hoe's latest improved perfecting press, capable of printing 12,000 per hour. The offices and counting room are well situated for use and convenience to the public on the ground floor, and up stairs is the composing room, equipped with new type and all the modern appliances for the production of a first class-newspaper. Here also the forms are stereotyped and the plates sent to the basement ready for the press. The *Times* was enlarged again by its present managers August 25, 1890, by adding a column to each page, making an eight page, seven column paper. It has always been a republican paper; it has a corps of bright, enterprising and experienced writers, and is a credit to the city and its suburbs, where the patronage is very extensive.

During Centennial week the *Times* made special efforts towards giving the people of Pawtucket a paper which should be a careful and well prepared report of each day's doings, several times issuing a twelve page sheet, and its reports were as accurate in detail as they were creditable to its staff of journalists. A large number of extra reporters were secured for the work.

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Hugh J. Carroll, the mayor of Pawtucket during the Cotton Centennial, is a citizen who has taken much interest in the welfare of the city. He was born in Warwick, R. I., October 29, 1854, and after the completion of his education in Niagara, N. Y., and Montreal, Canada, he entered upon the study of law with Sayles & Greene, of Providence, an eminent legal firm, the senior member of which was at that time attorney-general of Rhode Island. He commenced as a law student in 1875, and in August, 1877, was admitted to the bar in Kent county. In April, 1878, he came to Pawtucket and began the practice of law. He was town solicitor, and represented Pawtucket in the General Assembly in 1883, and several times afterwards. During his service there he introduced, in 1886, the ten-hour bill, and was successful in securing its passage.

In 1889 Mr. Carroll was elected mayor of Pawtucket on the democratic ticket. He was nominated by that party in 1886, but was defeated by F. C. Sayles. His position brought him into prominence during Centenary Exhibition week, and no man in the city was more interested in the success of that celebration. Prior to that he was instrumental in securing an appropriation of $10,000 from the General Assembly for the expenses of Centenary week, and $3,000 for the militia, and urged and secured an appropriation of $10,000 more from the city government. During Mayor Carroll's administration Walcott Street was opened up, widened and extended across Hammond's Pond and over the Plains, making this section two miles nearer the centre of Pawtucket. Mayor Carroll strongly advocated the widening of Main Street Bridge and Main Street, looking towards a better connection with the East Side; the building of a bridge across Hammond's Pond as an extension of Division Street, for the purpose of further developing that section; the extension of the horse railroad into that part of the city; the improvement of Pawtucket Avenue as far as the city line of Providence, to make it of equal beauty with the connecting street in Providence; the widening of the Broad Street railroad crossing and Railroad Avenue, for the purpose of preventing the blockades of the steam and street cars, and the scheme for abolishing the dangerous grade crossings in the city. An engineer is already making surveys for an improvement in this respect, and an agreement has been made between the railroad corporations and the city government for the safety of the citizens. Mayor Carroll advocated in his inaugural the erection of a new city hall, and it is probable that either a new hall or an addition to the present quarters will add to the convenience of the officials and citizens of Pawtucket within a few years. The advocacy of an enlargement of the present building is finding much favor at the present time.

The boom which Pawtucket has received since its incorporation as a city, particularly in merchandise traffic along its principal streets, is due largely, perhaps more than to any other person, to H. Herbert Sheldon. To those who were familiar with the condition of things before Mr. Sheldon became a resident it seems almost marvelous, reminding one more of the growth of a western city than of a staid New England town. This growth, however, in Pawtucket, is permanent, while the rapid growth of these western cities is often a thing of a day.

Mr. Sheldon came to Pawtucket at a time when the domestic trade of the city went largely to Providence. It was not from choice but necessity. The facilities of the city were unable to supply the demand. Large stores and good stocks of goods were few, and while the manufacturers were doing a prosperous business and large amounts of money were put in circulation each week, the people were permitted to leave their earnings elsewhere, because of the belief that the current of traffic could not be changed. Mr. Sheldon believed that the citizens of Pawtucket should do their trading at home, and foresaw that the working people in the mills, were they provided with good stocks of goods, at as low prices as ruled elsewhere, would liberally patronize home enterprise and contribute towards the prosperity of the city. As the first step in this direction Mr. Sheldon purchased from the Fifth National Bank, of Providence, the estate corner of Broad and Main streets, associating with himself Messrs. Whitaker & Smith, an enterprising firm of contractors and builders, for the purpose of improving the estate. He also leased other estates in the vicinity and began the erection of buildings. The stores which thus were put on the market were speedily taken. Dealers realized that there was something in Sheldon's scheme, after all, and they hastened to follow the example, building stores of their own, or improving other estates, until there was an entire change in that part of the city. Mr. Sheldon's last investment was the Wilmarth estate on Main Street, at the foot of Dexter, where he established the *Pawtucket Record*, in 1886, and continued its publication until November 1, 1890, when it was sold to David J. White, Esq. Mr. White has recently purchased the Central Falls *Weekly Visitor*, published for many years by E. L. Freeman, and has consolidated it with the *Record*.

H. H. SHELDON,

FOUNDER OF THE PAWTUCKET RECORD AND REAL ESTATE AGENT.

As a result Pawtucket has as large and finely equipped stores as any city in the State, and the money has been put in circulation at home. This has benefited the city in many ways, and particularly in the amount of taxable property, real and personal, added to the city, and in an increased valuation of all property within the limits of this enterprise. Valuations increased in some cases 300 per cent. with a prospect of still further increase.

Mr. Sheldon is now interested in pushing a street railroad between Pawtucket and Providence, and is as determined in that purpose as he was in the development of the property on Main Street. A charter has been applied for, a favorable report has been obtained from one Legislature, and there is no doubt of its success. Mr. Sheldon was born in Providence July 13, 1834. Having been a commercial traveler for a large New York firm for twenty years, during which time he invented and secured patents on a gas stove and an adjustable gas burner, sold afterwards to the E. P. Gleason Manufacturing Company, of New York, he obtained a business experience which fitted him specially for the Pawtucket enterprises. Mr. Sheldon is the type of a man essential to the prosperity of a city, his opposite being too frequently seen. Were there more of his stamp, possessed of his foresight and courage, the cities of New England might be formidable rivals of those in the West. Pawtucket is indebted greatly to him for pointing out the methods of advancing its interests. In years to come the buildings may be supplanted by more costly structures, but never by those which will show a greater comparative progress.

As agent for the heirs of the Hoyle estate he has erected, on the corner of High and Cranston streets, in Providence, a large block containing twenty three stores and forty offices. It is also understood that he is making arrangements, in connection with other parties, to lease the property in Providence, on Mathewson Street, between Westminster and Washington streets, with a view of making it similar to Winter Street in Boston. On account of the proposed terminal facilities it is thought by Mr. Sheldon that the retail stores will move in this direction.

The firm of Charles A. Luther & Company, situated on Leather Avenue, very near the Old Slater Mill, consists of William H. Peck and E. A. Burnham. Mr. Peck is the son-in-law of Mr. Luther, and the establishment of the business dates back to 1834, when the old Slater Mill store was utilized by Danforth L. Peck. In 1859 Mr. Charles A. Luther assumed control, and the industry was carried on by him until 1882, when Mr. William H. Peck was admitted to partnership and the firm became Charles A. Luther & Company. In 1883 Mr. Luther retired, and Mr. Peck continued. Mr. Luther invented many machines on which he received a patent, and these have since been the leading manufactures of the establishment. They consist of thread dressers, cloth-stretchers, reels and yarn bank spoolers, although estimates and patterns will be furnished for other machinery. Mr. Peck has been in his present quarters since 1881, and recently has been making the Stephens four-color yarn printing machine, the invention of Edward J. Stephens, of Pawtucket. It prints three or four colors as desired at a time on a single yarn, printing from the beam five hundred to one thousand threads at one time. This machine is in use by the American Yarn Printing Company, which prints yarn for the ginghams made by the Lorraine Manufacturing Company.

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The firm of George W. Payne & Company, manufacturers of upright spoolers, succeeded to the business of James Arnold, who was the inventor and first manufacturer of upright spoolers in America. The present firm dates back to 1865, and has moved its manufactory three times. Its first building was in Jenks' Lane; then a removal was made to East Avenue, and February, 1883, the present building, on Broad Street, nearly opposite the railroad station, was occupied. The spoolers made at the present time are substantially the invention of Mr. Arnold, with improvements from time to time. All kinds of spoolers and hosiery winders are made by the firm, whose largest market is in New York, though the products of its industry are sold all over the world. About forty persons are employed in the business, and the demand is fully equal to that of former years.

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A portion of the old Slater Mill is occupied by the firm of J. Crocker & Son, where is manufactured a line of novelties in wire goods that has developed into a large business. The firm started twenty years ago making ornaments for coffins and caskets, which continued until 1883, when the manufacture of novelties was commenced, and there are now made wire easels, banner stands and goods of this description for both the holiday and general trade. One of the recent branches of industry developed here is the manufacture of a line of flexible goods, used as coffin ornaments, taking the place of what is known as solid goods. They are made of wire, in the form of flowers and leaves, are adjustable to any moulding, and can be used in any shape or form. They are meeting with instantaneous success, and the firm anticipates an increasing demand for the goods. This line of manufactured article finds a market all over the country, and is sold largely through jobbers. The firm started in a small building north of its present location, but finding the room unequal to the necessities of a growing industry, took quarters in the Slater Mill. There is no limit to the class of goods that can be produced from the material used by this firm, and novelties are being originated constantly, the reputation of the firm commanding a ready sale of such articles.

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The plant of the Rhode Island Card Board Company, situated on Exchange Street, is the outgrowth of one of the early manufactures of Pawtucket — the oldest establishment of its kind in the country. In 1840 Mr. Ray Potter began the manufacture of card board in a small room on North Main Street, doing the pasting by hand, and sowing the seeds of an industry which has developed into large proportions in different parts of the country. A little later, Mr. H. H. Thomas became a partner in the firm, which was known as H. H. Thomas & Company. Prosperity attended the efforts of the firm, Henry B. Dexter purchased an interest, and the manufactory was removed to new and larger quarters. Mr. Thomas retired in 1870, and Mr. George H. Clark was admitted. From this date the business was conducted under the name of the Rhode Island Card Board Company, Messrs. Dexter & Clark proprietors. In 1880 the present quarters were purchased, a large and substantial building, fully capable of meeting the demands for the products of the concern. In 1886 an incorporated company was formed, and in 1889 Messrs. Dexter & Clark retired from the management, and the present proprietors, Messrs. Lowell Emerson and Walter H. Stearns, obtained control. Mr. Emerson is president and Mr. Stearns secretary and treasurer of the corporation. Machinery is now largely used for the manufacture of the stock, which includes all kinds of coated lithographic board, tag stock, and the various grades of card board used by lithographers and printers in their business. About fifty people find employment here, and the company finds a market for its goods in all parts of the country, in South America and in Canada. The reputation of the card board made in this establishment has always been high, and it is the purpose of the present management to fully maintain it. The large growth of business in this country has made the manufacture of card board one of the important branches of industry.

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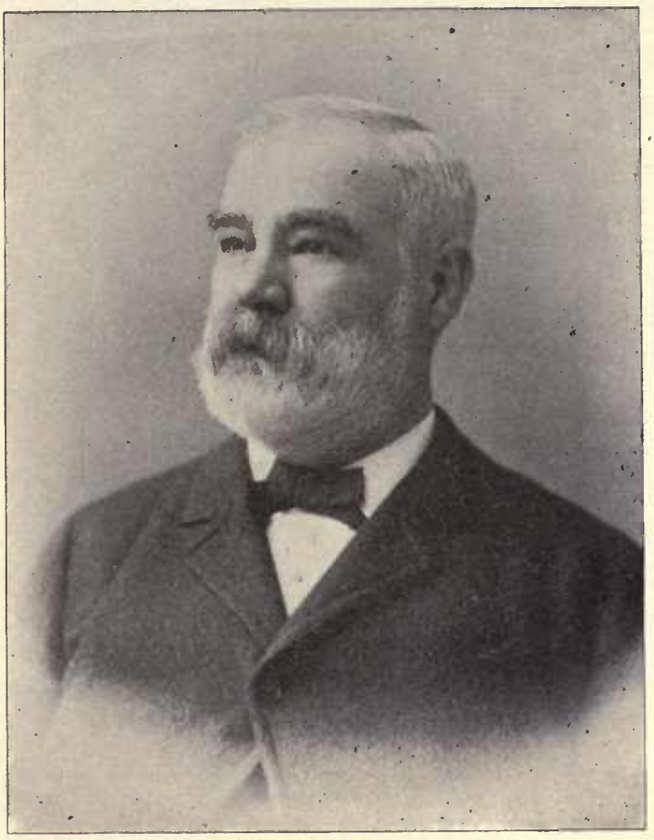
With the exception of the manufacture of belt leather, which was needed for use in the mills, the leather industry has been a very small one in Pawtucket. A few firms have done a successful business in making lace and picker leather and different grades of belting and harness leather. Among these may be noticed the firm of Weatherhead, Thompson & Company, which was established in 1857. The belting made by this concern is manufactured from oak tanned leather, and has found a market in all parts of the country. In addition to this industry the firm has made cotton spools in large quantities in connection with its other business — a combination which is not explainable by any natural law, but which has brought the firm into considerable notoriety on account of its enterprise.

The buying and selling of real estate has been an important business in the growth which Pawtucket has had within the last decade. There have been some large transactions, many of which have inured to great profit to the purchasers. In their consummation the advice of the real estate agent, who is familiar with values and gifted with natural foresight, is often of inestimable value. Among the dealers in real estate there is none more reliable in judgment, or whose experience is more far reaching than Charles A. Warland, whose office is at the present time situated at No. 56 East Avenue. Mr. Warland was born in Cambridge, Mass., in 1830, his family being one of the oldest in that historic place. Mr. Warland's father inherited the old homestead which had been erected several generations before his time, which he sold in 1810, and erected several buildings on Appian Way and Brattle Street, in one of which he lived when the subject of this sketch was born. Mr. Warland was educated in the public schools of Cambridge, and served an apprenticeship in the commission business with Charles Wilkins & Company on Long Wharf, in Boston. In 1856 he came to Pawtucket, and in 1857 became connected with the machine business in the shop of James S. Brown, continuing there several years. In 1868, Mr. Warland became interested in buying and selling real estate, and opened an office in Almy's Block, near the bridge—the first real estate office opened in Pawtucket. He remained here six years, and removed to his present location on East Avenue, where he has been for sixteen years.

Mr. Warland's business has been largely that of a real estate broker, making purchases and sales entirely for other people. He has been also auctioneer, notary public, and insurance agent during this time, and has been commissioner for the State of Massachusetts since 1872, having received his first appointment from Governor William B. Washburn. He was on the board of assessors of Pawtucket in 1874, at the time of the consolidation with North Providence, and was a member of the town council before Pawtucket became a city. Mr. Warland's experience in real estate transactions has been large, and he has been called upon by the court as one of the commissioners for the division of many large estates, among which may be mentioned the Weeden estate, situated in Pawtucket and Lincoln. As general appraiser, his judgment is considered very reliable, and he is appointed frequently as commissioner in the interest of the city in the widening and extension of streets. In the matter of the readjustment of the boundary line between Massachusetts and Rhode Island Mr. Warland took a prominent part, and was efficient in securing an equitable adjustment of the boundary. During the war he was active in obtaining subscriptions for the relief of the soldiers and their families, and for assisting the recruits to enter the service of the country. He has in his possession an old subscription paper containing the names, with the amount subscribed, of Pawtucket's most honored citizens, and the sums collected were mostly disbursed by Mr. Warland at that time. In all his business transactions he has served his patrons honorably and faithfully, and this confidence in his integrity has led



C. A. WARLAND,

REAL ESTATE AGENT, PAWTUCKET.

to his appointment as administrator and executor of many estates, as well as being entrusted with the investment of securities. He is corresponding member of the American Real Estate Association, whose principal office is in Memphis, Tenn. He is doing a large and successful business, and numbers among his patrons the best citizens of the city and its vicinity.

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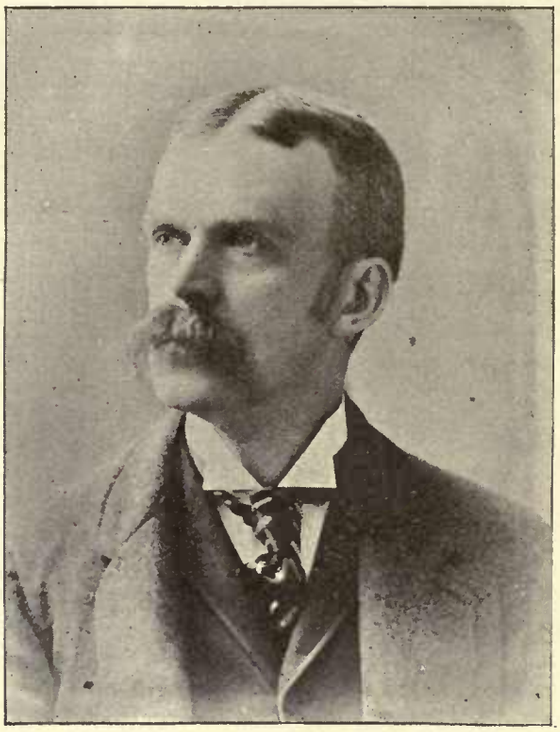
The "Old Brown Machine Shop," as it is familiarly called, at the corner of Main and Pine streets, was built by James S. Brown, the father of the present proprietor, in 1842. Mr. Brown, senior, began work at an early age with Pitcher & Gay, then the largest machinists in Pawtucket. In 1824, Mr. Gay retired and Mr. Brown, who had proved himself a competent mechanic, was admitted to partnership. The firm became Pitcher & Brown until 1842, when Mr. Brown assumed the entire control and erected the building which still bears his name. Mr. Brown was an inventor, and a large number of the machines in the present shop were made by him. James Brown, the present proprietor, became a member of the firm shortly before his father died in 1879, and since that time has had entire management of the business. Cotton mules and speeders are made by Mr. Brown, as in former years, but cordage machinery, a large proportion of which is sent West, has been a specialty of late years.



FRANK M. BATES,

OF N. BATES & SON, ORATOR AT THE DEDICATION OF THE COLLYER MONUMENT.

Colonel Frank M. Bates, the junior partner of the firm of N. Bates & Son, is prominently identified with the prosperity of Pawtucket, and is one of the city's enterprising and public spirited citizens. He is a native of that city and a graduate of its public schools. After graduating, he obtained employment with the firm of Gorham Company & Brown, of Providence. Continuing here nearly two years, he returned to Pawtucket, entered the employ of N. Bates & Company, which then consisted of his father, N. Bates, and William B. Bates. In 1866 the latter retired, and the subject of this sketch was admitted to partnership with his father, where he continues business at the present time.

Colonel Bates' military experience dates from the formation of the Pawtucket Horse Guards in 1863. He was one of its earliest members, and its commander in 1868–69. On the election of Governor Bourn, in 1884, he was offered an appointment on the Governor's staff, which was declined. In 1885 Governor Bourn appointed Colonel Bates a member of his staff, to represent Rhode Island on the staff of General Philip H. Sheridan at the dedication of the Washington Monument, February 22, 1885. Colonel Bates was a member of the school board of the old town of Pawtucket for two years, and was a member of the lower branch of the General Assembly from 1879 to 1882, being a member of the committee on military affairs, and its chairman during the last two years. In 1884 he was delegate at large from Rhode Island to the National Republican Convention in Chicago, which nominated Blaine, and was the only Blaine man on the delegation. During the Centenary celebration Colonel Bates was chief of staff on Military day, and delivered the oration on Saturday at the dedication of the Collyer Monument. For many years he has been fire correspondent for the *Gazette and Chronicle*, and has been at various other times the correspondent for that paper and the *Daily Times*. He is also secretary and treasurer of the Veteran Firemen's Association. Colonel Bates' great-grandfather, on his mother's side, Amariah Marsh, was a teacher in Slater's Sunday-school, and the family since that time has been directly connected with the First Baptist Church, Colonel Bates having been a teacher in the Sunday-school for twenty-seven years.

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Hon. Almon K. Goodwin, the present mayor of Pawtucket, was elected in the fall of 1890 for the third time since its incorporation as a city, after a close contest which demonstrated his great popularity with its citizens. With another candidate the republican party was defeated in the city election the previous year; but under the vigorous lead of Mayor Goodwin it regained its former standing.

Almon K. Goodwin was born in South Berwick, Maine, March 27, 1839; was educated in its public schools and in the South Berwick Academy, where he was fitted for college. Having determined to adopt the medical profession, he relinquished the idea of a collegiate course, and came at once to Pawtucket to study in the office of Dr. Clapp. Finding the practice of medicine not congenial to his tastes, he engaged in the wholesale flour and commission business in Providence, which he continued until 1887.

Mayor Goodwin was early interested in politics, and has been identified with the republican party from its origin, and more or less prominent in its councils. His eloquent advocacy of its principles on the stump and elsewhere secured for him immediate notice, and he was chairman of the republican town committee of Pawtucket for many years prior to its incorporation as a city, and continued as chairman of the city committee until his election as mayor. He has been chairman of the republican state central committee for a number of years — a position which he holds to-day. He was a member of the General Assembly from Pawtucket in 1875-76, and again in 1882, during which time he was chairman of the House committee on militia, and a member of the committee on corporations. In 1880, he was a delegate to the republican national convention which nominated James A. Garfield for president. Mayor Goodwin was auditor of the town and city of Pawtucket for many years until he was chosen to the mayoralty office, and in May, 1887, he was elected by the General Assembly state auditor for the year ensuing. He succeeded Hon. F. C. Sayles as mayor of Pawtucket in 1888, and was re-elected by the largest majority ever given to a candidate for this office. In 1889, Charles A. Lee was nominated by the republican party and defeated, and in 1890, the party again looked to Mayor Goodwin as its standard bearer—every ward in the city choosing delegates in his favor, thus ensuring his unanimous nomination. He carried the election by a handsome vote. He is interested in the improvement and prosperity of the city, has been a member of the Business Men's Association from its inception,

of which he is its first vice-president, and on his election as mayor he advocated the widening of High Street, a work of great importance to Pawtucket. In accordance with his recommendation, the widening was ordered by the city council, but has not as yet been fully completed. Mayor Goodwin has been prominently identified with the state militia, and was a member of the staff of Major-Generals Horace Daniels and William R. Walker — in all about eleven years. In June, 1889, he was appointed by Governor Ladd commissioner of the bureau of statistics of Rhode Island, for two years. September 16, 1858, Mayor Goodwin married Sarah Margaret, daughter of John C. Tower of Pawtucket, whose son, Captain Levi Tower, was killed in the first battle of Bull Run, fighting valiantly in his country's service.

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The manufacture of knitting cotton, which has always been more or less an active industry in Pawtucket, was begun by Captain N. G. B. Dexter, who came to the town in 1799, crossing the bridge to see the erection of the frame of the second cotton mill which was built in Pawtucket. Captain Dexter entered the employ of Almy, Brown & Slater, and in 1820 began the manufacture of knitting cotton. Captain Dexter died in 1866, and his successors continued the manufacture under the style of Dexter Brothers until 1880, when it became an incorporated company — the Dexter Yarn Company. Cotton yarns of different kinds and knitting cotton put up in boxes have been the principal products of the manufactory. The knitting cotton has not been sold in Boston market since 1882, but has a large sale in New York and the West. One hundred and eighty people are employed by the company.

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R. A. Butler, who has been manufacturing lace and belt leather in Pawtucket for ten years or more, has made a considerable change within the past year, and is finishing colored kid and morocco. This establishment was known as the Star Tanning Company a few years since, but Mr. Butler is at present conducting the business under his own name. Before coming to Pawtucket Mr. Butler was in business in Attleboro'. About thirty-three dozen per week is the present product in the morocco line, and he is the only manufacturer in Pawtucket of that class of goods.

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The exhibit of the manufacturers and tradesmen in Machinery Hall in Pawtucket, during Centennial week, was a very important part of the celebration. It was the central point of attraction to the visitors, and so successful from every point of view that the exhibit was continued another week — the receipts being exceedingly satisfactory and fully justifying the wisdom of the committee in extending the time. Of this committee George Mabbett was chairman, and this part of the Centennial was controlled by the Manufacturers' Association, through its committee, independent of the work of the city government. Mr. Mabbett is an Englishman, but coming to this country at a very early age, he considers himself a thorough American in every sense of the word. He was born in 1849, at Trowbridge in Wiltshire in the west of England, and came to America with his parents in 1854, settling in Westerly, R. I. Here he attended the public schools until the age of ten years, when he was compelled, being the oldest child in the family, to enter the mills and begin work. During this time, all the education he obtained was from the night schools and his studies at home, after the work of the day in the mill had been completed. He was an apt student, both in his books and in the mill, and at the age of 17, in 1867, he had charge of a weaving room in the woolen mills at Mystic, Conn. Here he remained until 1875, when he was appointed superintendent of the Wequonuk Mills Company at Occum, Conn., and in the fall of 1876 was chosen agent of the Millbrooke Woolen Company in South Coventry, Conn. During his service here, Mr. Huntington, who was one of the largest owners, died, and the estate was closed up. Mr. Mabbett went therefore to North Adams, Mass., as manager of the Glen Woolen Company of that place. This was in January, 1878. After Mr. Mabbett had been at North Adams one year he purchased one-fourth interest in the company, and here he remained as part owner and manager until January, 1885, at which time he owned one-third of the property. The mill was burned, and March 1, 1885, he came to the Central Falls Woolen Mills, having been manager and superintendent until January 1, 1891, when he resigned to take a position as agent of the Mineral Springs Manufacturing Company in Stafford Springs, Conn. The Central Falls Woolen Company, with which he has been connected recently, has prospered greatly during Mr. Mabbett's connection with it, employing 175 people, and doing an annual business of $350,000, making fancy cassimeres, worsteds, cheviots and Venetian cloths. It is an incorporated company and has been manufacturing these goods for nineteen years. Mr. Mabbett has been a member of the Business Men's Association of Pawtucket, was interested in the success of the manufacturers' exhibition, and being chairman of that committee took a prominent part in carrying out the details which led to such an enthusiastic response from the citizens. He presided at the formal opening of the exhibition hall, and had the satisfaction of presenting to the citizens such an exhibit of the products of the manufactures of Pawtucket and vicinity as had never before been witnessed in that place.

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The growth and present prosperity of the industry conducted by the Perry Oil Company is another illustration of the diversified character of the business of Pawtucket. The Perry Oil Company started in a small way, and with varying success, in Providence, in 1878. Its three specialties were harness soap, harness oil and axle oil. In 1879, Reuben K. Miller purchased the plant and removed it to the present location, 101 Exchange Street, Pawtucket, retaining, however, the old name under which the business had at first been carried on. Mr. Miller continued the manufacture of the soaps and oil for harnesses, and later added that of lubricating and machine oils. The business increased entirely on the merits of the goods, no traveling salesmen being employed, and Mr. Miller doing but little in soliciting trade. The harness

soap and oil soon found a ready market from Maine to California, and later in South America, Australia and Europe. In 1888, after ten years of practical experience, and with the assistance of the most eminent chemists in the state, Mr. Miller made a decided improvement in the quality of the goods, and obtained the trade mark of Champion, under which name the entire product of harness oil soap is now sold. The trade in lubricating oils had also increased. Mr. Miller has for several years supplied the large establishments of Pawtucket and vicinity with their needs in this direction, and this trade has also been built up on the merits of the oils, and without any solicitation on the part of the Perry Oil Company. From small beginnings, by strict attention to the details of the industry, and an endeavor to furnish a superior article, Mr. Miller has found that his business has rapidly developed within a few years, and in December, 1890, George T. Greenhalgh was admitted as partner. Mr. Greenhalgh has had a long and extensive experience in supplying lubricating oils to the most important establishments in different parts of New England, and devotes his attention entirely to this branch of the business, while Mr. Miller retains the management of the manufacture of harness soap and oil. The amount of business done in 1890 was three times as great as that of the preceding year, and the company anticipates a proportionate increase in the future. It is the only establishment of its kind in Pawtucket.

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The machine shop of Moncrief, McLay & Company, situated in the rear of 56 East Avenue, was originally started to make repairs and build the machinery for the boats of the Pawtucket Steamboat Company. Since 1880, this firm has been interested in the steamboat excursion business; in 1885, an incorporated company was formed under the style of the Pawtucket Steamboat Company, of which Mr. Moncrief is general manager. The two steamers of the company are chartered in the summer time by Sunday-schools, private or excursion parties for trips down the bay, for moonlights, or other purposes. Sundays, hourly excursions are made to Bullock's Point, and on other days when the boats are not chartered by outside parties. Each boat will accommodate about five hundred passengers. A new steamer has been added to the line within a year, and all the machinery was built by Moncrief, McLay & Company, at their shop on East Avenue. Mr. Moncrief, previous to 1888, was master mechanic at the Dunnell Print Works, and had been in the employ of that corporation more than twenty years. He is a practical machinist and has been at work for some time in perfecting a friction pulley.

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Henry E. Tiepke, the chairman of the city council cotton centenary committee, was born in Pawtucket, March 21, 1857. After an education in the public schools, he began work at the Dunnell Print Works, shortly after engaging himself with George Mumford & Company, hardware dealers On the retirement of this firm from business Mr. Tiepke connected himself with Sargent & Company, of New York, the largest wholesale hardware house in America, but soon returned to Pawtucket, where he became clerk to the superintendent of the foundry department in the establishment of Fales & Jenks. Later he was employed by the James Hill Manufacturing Company, of Providence, and has been for ten years New England Manager for the Iron Clad Manufacturing Company, of New York.

Mr. Tiepke became interested in politics as soon as he was able to vote. His first office was that of district clerk of the town of Pawtucket, on the east side. Afterwards he was district warden, and on the organization of the city in 1885, he became warden of the first district. In the fall of 1887, he was elected to the Common Council, serving in 1888–89–90, and was elected alderman for the year 1891. In the Council he advocated municipal lighting by electricity, a measure which passed both bodies, but was vetoed by the Mayor. As a result, however, of the agitation, the Gas Company made a considerable reduction in the price of electric lights for the city. Mr. Tiepke introduced the resolution requesting the General Assembly to apply the Australian ballot to the city elections in Pawtucket, which was granted, and he was also instrumental in establishing an ordinance requiring contractors for city work to submit bids. He organized the Garfield Club, and has been its president from the beginning. He introduced the resolution that originated the city council centenary committee, of which he was elected chairman. Mr. Tiepke filled this position which required much time, patience, and attention to details, with great satisfaction to the people of Pawtucket and credit to himself, and in the conduct of its difficult duties developed good administrative ability.

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In the Record Building, No. 330 Main Street, is situated the printing office of John W. Little & Company. It is well fitted with the most modern facilities for the execution of book and job printing and the proprietors have given abundant evidence of their practical knowledge. The firm has done the city printing for some time, and during Centennial week, at the different banquets given, there were printed by J. W. Little & Company some very tasteful and unique souvenir menus.

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The original plant of the Home Bleach and Dye Works, which is now controlled by Peter B. McManus, was formerly owned by the Union Wadding Company. The old mill had been used for a variety of purposes. When the Wadding Company fitted it up for bleaching raw cotton, a few years after, Mr. McManus was employed as manager of this Union Wadding Bleachery and continued in that capacity for three years. During his management the present name of the plant was given to it, and another building was erected for the dyeing of cotton yarns and spool thread, a business with which Mr. McManus was very familiar. The demand for this class of work became very large, and in 1884 the Union Wadding Company sold the plant to Mr. McManus, under whose very able management the establishment has obtained a high reputation for the quality of its work. About one year ago, Mr. McManus leased the new dye house, in Valley Falls, belonging to the Valley Falls Company, which contained all the

modern improvements for the dyeing of cotton, and both manufactories are at this time under his control. The new plant is 270 x 75, contains three Sullivan boilers, one forty horse-power engine and five smaller ones, and the old plant has two Sullivan boilers and one seventy-five horse-power engine. The two mills combined have a capacity for turning out 17,000 pounds of finished yarn per day, and give employment to about seventy people.

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The William H. Haskell Company, located at 277 Main Street, does a business in the manufacture of its different varieties of bolts and screws that has made it one of the most successful industries in Pawtucket. Mr. Hervey Pinkham, who was associated with Mr. Haskell, the present proprietor, was in former years a partner with Col. Stephen Jenks, who began the business in 1820, and was the first man in Pawtucket to introduce cold punching from bar and sheet iron. The industry has grown from year to year, and many of the classes of goods manufactured were first made in this country by the firm. It has been necessary to compete with foreign makes, but the industry and perseverance of Mr. Haskell, added to the high standard which has been attained in the manufacture of every article turned out at the shop, has largely removed this competition. All the different kinds of screws, many peculiar shaped bolt heads, often a matter of great importance, are manufactured here, and the greatest care is exercised that superior excellence may be obtained. New tools and machinery have been necessary, but all these demands have been met, to the advantage of the company; and the goods made here find their way into the markets of the old world, and are favorably known in all parts of this country. The officers of the company are William H. Haskell, president; Edmund S. Mason, treasurer; D. A. Hunt, agent.

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The Pawtucket *Gazette and Chronicle*, edited and published by Charles A. Lee, is the oldest paper in Pawtucket, and is the result of a consolidation of two papers, the *Chronicle*, which was first printed November 12, 1825, and the *Gazette*, whose first number was issued August 3, 1838. The *Chronicle* was started by John C. Harwood, and continued under various changes and vicissitudes until 1839, when it was purchased by Sherman & Kinnicutt, who had the year previous begun the publication of the *Gazette*. Under this management the *Gazette and Chronicle* prospered, and continued until 1864, when Ansel D. Nickerson became a partner, and in 1870 Mr. Nickerson and John S. Sibley were sole proprietors. Meantime Mr. Lee had been in the employ of the firm, was admitted a partner in 1875, and in 1878 purchased Mr. Nickerson's interest and assumed editorial control of the paper. The firm was then Sibley & Lee, and on the death of Mr. Sibley, which took place September 13, 1881, Mr. Lee became sole proprietor, and has continued to the present time.

CHARLES A. LEE,

EDITOR AND PROPRIETOR OF THE PAWTUCKET GAZETTE AND CHRONICLE.

The paper has several times been enlarged and improved. Of late years it has been a nine column folio, 31 x 48, until January 1, 1891, when it was issued as an eight-page paper, following the example of more modern newspapers. Mr. Lee is a practical printer, a competent writer and journalist and a thorough business man. Under his management the *Gazette and Chronicle* has attained a high reputation not confined to its local limitations, and Editor Lee is exceedingly popular among his editorial brethren as well as in Pawtucket. He is a ready speaker, a good parliamentarian, has been president of the Suburban Press Association and the National Editorial Association, and prominently identified with local associations and societies.

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The manufacture of hosiery has proved a successful enterprise in Pawtucket, and the plant of the Rhode Island Hosiery Company, in Central Falls, is one of the youngest in the vicinity. Two years ago, Oscar A. Newell, the treasurer and manager of this corporation, bought out Oliver H. Hathaway, who was doing a business of some five or six dozen per day, and formed an incorporated company of which he is the largest stockholder. Mr. Newell had no experience in the

OSCAR A. NEWELL,

TREASURER OF THE RHODE ISLAND HOSIERY COMPANY.

manufacture of hosiery, having been associated with his father, William Newell, in Central Falls, for fifteen years, under the name of William Newell & Son. This firm had a large brass foundry at this place, which was carrying on a successful business, taking extensive contracts, one of which with the Providence Water Works was filled during the time of Oscar A. Newell's association with the firm. Mr. Newell left the foundry on account of ill-health, engaging in the manufacture of jewelry until he purchased the hosiery plant which he now carries on. He has made a success of every business which he has undertaken, and the product of the Rhode Island Hosiery Company has increased from the small proportions of six dozen to one hundred dozen per week, within two years. A specialty is made of a fast black cotton hose — the dyeing for which is done on the premises — and children's and misses' hosiery is the principal production of the factory. These goods are of medium quality and are sold largely in the New York market. The company occupies at present two floors in a building controlled by Mr. Newell, and an increase in the capital stock of the company is contemplated, with the intent of further developing the business, manufacturing woolen hosiery and finer grades, and occupying the entire building. About forty-five people find employment here — many of them women, and the wages paid by Mr. Newell enables him to secure the best class of labor. The work is done by the piece, and some of the girls earn from $1.80 to $2.00 per day.

Mr. Newell was born in Cumberland, and came to Central Falls in 1847, where he has since resided. He has been interested in public affairs to a large extent, and was chosen for six years one of the firewards of Central Falls district, was one of the school-board for two years, and a member of the lower house of the General Assembly representing the town of Lincoln for the years 1884-5-6-7, declining a re-election at the close of his term of office. Mr. Newell is a republican in politics.

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The manufacture of stay webs, bindings, silk finished, plain and fancy spool tapes and braids was begun some twenty years ago by John J. Kenyon in Pawtucket. Mr. Kenyon is a native of England, learning his trade in Lancashire, and the business, which at first was up-hill work against the competition in the market, has grown and prospered, owing largely to the persistent energy of the proprietor and the superior quality of the goods. Mr. Kenyon's factory is now situated in the rear of 56 East Avenue, and comprises seven floors, with 23,000 feet of surface, filled with machinery of the most modern construction, including eighteen looms and 350 braiding-machines. Mr. Kenyon also makes a specialty of finishing yarns, and his improved machinery, for producing almost any style of finish desired, has gained for him a reputation second to no one in this country. He has recently added a thread department, and is now furnishing the trade with two, three and four ply thread, put up on machine and operator spools and on paper tubes. Mr. Kenyon devotes his entire time to the business, with the minutest details of which he is familiar, and to which he attributes a large share of his success, and his goods are known and sold in all parts of this country and in the Canadian Provinces. From one hundred and twenty-five to one hundred and fifty people find employment. Mr. Kenyon is agent for the Pawtucket Paper Company, which is putting up a line of superfine papers conceded to be among the finest in this style of goods manufactured in this country.

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The two young men who compose the firm of Norris & Keagan, manufacturers and dealers in mattresses, have been in business together nearly three years, on Exchange Street. They had previously been employes of the firm of S. T. Hornby & Company, which had carried on business for many years, and whose interest they purchased. All grades of mattresses are made here, which are sold to the wholesale trade in Providence and vicinity. Some retail business in Pawtucket is also done, and the firm is also prepared to renovate mattresses. Both members of the firm are natives of Pawtucket, and are building up a business likely to prove of considerable importance to the city.

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Many different appliances for use in cotton and woolen mills are made in Pawtucket, and the manufactories show the variety of industry which has been noted as a distinguishing characteristic of the place. The factory of Edward Adamson, on Broad Street, is an example of these unique establishments, where is made an appliance that is coming rapidly into favor in the mills where it has found a place. Mr. Adamson has been a reed maker for

nearly forty years — not all of this time, however, in Pawtucket — and was conscious that an improvement could be made in the style of reeds made use of in the cotton and woolen mills. After many experiments, he invented and obtained a patent on what is called Adamson's Flexible Bevel Dent Reeds, and for the manufacture of these he started business in 1883, in the shop belonging to George W. Payne, under the style of the Excelsior Loom Reed Works. The invention is a direct departure from the old reed, and requires special machinery to manufacture it properly. It was therefore necessary to invent and develop machinery that would do the desired work. This has been accomplished, and within a few years the demand for this reed has largely increased. It is flexible and elastic, and however far apart the wires are separated by the insertion of any substance between them, they will spring back to the original position as soon as the substance is removed. In the other reeds the wires will not do this, and it is necessary to stop and adjust them in case any substance obtains lodgment between the wires. During the past year this industry has increased fully one-third, the superiority of the reed being acknowledged everywhere, as soon as a trial is made, and the mills in New England are largely supplied with Mr. Adamson's reeds. The wire used in the manufacture is polished and shaped to any size desired in the factory of the Excelsior Loom Reed Works — a large proportion of the wire being made from Norway iron, which is the best for the purpose. Mr. Adamson deals also in belting, lace and picker leather and general mill supplies.

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The large jewelry establishment of F. W. Dexter, who carries on a wholesale as well as retail trade, on Main Street, was established in 1854 by W. W. Dexter, the father of the present proprietor. The business was conducted on Mill Street, on the site of the Spencer Block, in the early days, but Mr. Dexter removed later to the store on Main Street, which had been entirely remodeled. At that time it was considered that Mr. Dexter was so far up town that he would be entirely out of the line of trade. But his business continued to prosper, and at the present time a better location could not be selected. F. W. Dexter, the present proprietor, has been connected with the store for sixteen years, a portion of the time in partnership with his father, until January, 1888, he purchased his father's interest and became sole proprietor. A large assortment of the different goods kept in a first-class jewelry store is carried — and sufficient to enable Mr. Dexter to do a wholesale as well as a large retail trade. Many of the goods are directly imported, especially for the holiday trade, enabling the proprietor to furnish his patrons with novelties which could not otherwise be obtained. The store is neatly fitted up, with plenty of light, and six clerks are employed to attend to the wants of the customers. The choicest goods, the finest silver ware, as well as articles of moderate price, are to be seen deftly arranged for inspection inside the store, while the show windows are always attractive to passers. A specialty is made of the correct fitting of glasses to the eye, and a perfect fit is guaranteed in all

F. W. DEXTER,

JEWELER, PAWTUCKET.

cases. This was done under the senior Mr. Dexter with great success, who instructed the present proprietor in the details of this difficult branch of the business. Mr. Dexter took great interest in the Cotton Centennial, and his display in Exhibition Hall, where he had engravers at work, and over $7,000 worth of goods, was acknowledged to be one of the finest among the tradesmen who made exhibits. He was treasurer of King Kotton Karnival and the ball which followed during Centennial week, and of the exhibitors' banquet; was timekeeper for the boat club at the regatta, and marshal on the staff of General Olney Arnold. He was also a member of the committee having the trades procession in charge.

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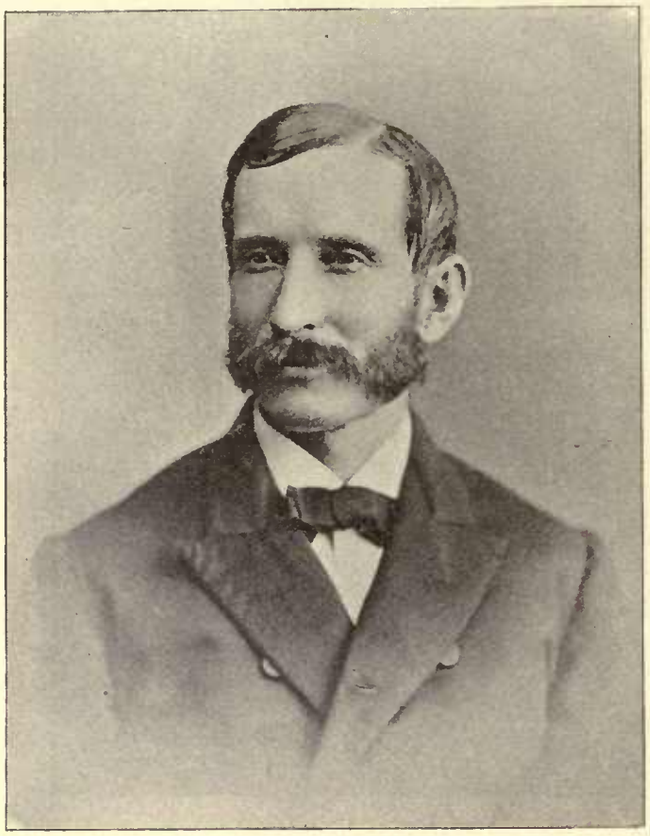
The printing and publishing establishment of E. L. Freeman & Son, located on the corner of Mill and Central streets, in Central Falls, is one of the industries of the place which has developed from small beginnings to one of the finest plants in the state. Messrs. Freeman & Son have been state printers for thirteen years, own two stores for the sale of blank books, stationery and school supplies, and have recently added a process of art work, which has become very successful, and whose productions are meeting with increasing favor. Mr. E. L. Freeman, the founder of the business, was born in Waterville, Maine, September 10, 1835. His father was a clergyman, under whose guidance and instruction Mr. Freeman was fitted for college, but instead of an academic course he apprenticed himself to A. W. Pearce, of Pawtucket, to learn the art of printing. At the close of



E. L. FREEMAN,

FOUNDER OF THE PRINTING, LITHOGRAPHING AND STATIONERY ESTABLISHMENTS OF E. L. FREEMAN & SON.

his apprenticeship in 1853, he was employed by Hammond, Angell & Company, of Providence, in whose service he continued eight years, spending one winter in the Government Printing Office in Washington. On his return he purchased an interest in the Providence firm, remaining two years longer, and in 1863 he came to Central Falls, where he began the printing business for himself in one room on the lower floor of the building now occupied by the firm. The industry was largely confined to the printing of labels for thread and other manufacturers, Mr. Freeman employing at that time two men and one boy, and doing a large share of the work himself. It prospered, more room was occupied in the building, and in 1869, the Central Falls *Weekly Visitor* began its career, Mr. Freeman, like most country publishers, editing the paper, and at the same time doing a large share of the mechanical work on the paper and in the office. The *Visitor* has been recently sold and consolidated with the Pawtucket *Record*. The industry has developed, until a general book and job printing business is done, of large dimensions, and giving employment to about sixty people. In 1877 the firm became printers to the state, and since 1881 has published and printed the *Freemason's Repository*, a prominent organ in masonic circles. In 1873, John E. Goldsworthy was admitted to the firm, the style being E. L. Freeman & Company. In November, 1885, Mr. Freeman's son, William C., purchased Mr. Goldsworthy's interest, and the firm became E. L. Freeman & Son.

In 1877, the firm purchased the book store of Valpey, Angell & Company, of Providence, where is kept, at No. 3 Westminster Street, a large line of blank books and stationery, for the use of business men and manufacturers. In 1888 a branch store was established at 191 Main Street, Pawtucket. In both stores is kept a full assortment of school books and supplies. In 1888 the Artogravure Company was incorporated for the purpose of making a specialty of art work. There is reproduced under the gelatine process a style of art work that has met with a large sale. William C. Freeman is treasurer and sole manager of this company. Many of the pictures are taken from photographs. Five sizes of the plates are used in producing the works of art, of which the company has already three hundred subjects, and the line is constantly increasing. Gelatine printing is done of any kind of work, such as the reproduction of buildings and machinery from portraits, and the works of art find a market through jobbers and picture dealers in all parts of the country. Over thirty people are employed in this department. Mr. Freeman, senior, has represented Central Falls in the General Assembly many years. He was in both branches of the Assembly from the old town of Smithfield, a representative from 1868-70, and a senator 1870-71, and was the first senator from the new town of Lincoln in 1871-72. He was again representative for the years 1874-77, during the first two of which, 1874-75, he was speaker of the House, and wears to-day, as souvenir of that occasion, an elegant gold watch presented by his associates. Later he was a member of the House, from 1879 to 1889. Mr. Freeman is very prominent in the Masonic order. He joined Union Lodge, No. 10, of Pawtucket, in 1864, was Master of that lodge in 1869-70, and Grand Master of the Grand Lodge of Rhode Island in 1879-80. In 1885 he was the Grand High Priest of the Grand Chapter of Royal Arch Masons of Rhode Island. He was elected Commander of Holy Sepulchre Commandery of Knights Templars, October 4, 1870, serving three years, and in 1889 was Grand Commander of Massachusetts and Rhode Island. Mr. Freeman is at present the railroad commissioner of the state, his term expiring in 1892. Up to 1887, he had been one of the firewards of the Central Falls district for nineteen years in succession, which body has entire charge, at Central Falls, of the police, the water works, street lights, fire department and public library. Mr. Freeman is a member of the Odd Fellows and many other organizations, and is greatly interested in Sunday-school and church work in Central Falls.

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Among the varied industries of Rhode Island, the manufacture of card boards and glazed paper has developed into considerable prominence in Pawtucket, and the business carried on here by the Orient Card and Paper Company stands among the foremost in this branch of industry in the country. The plant was established in Pawtucket in 1886, and a specialty has been made from the beginning of the manufacture of coated or enameled paper, specifically adapted for the existing requirements of steam lithographic and color printing, and by a very

ORIENT CARD AND PAPER COMPANY'S MANUFACTORY, PAWTUCKET.

careful attention to every detail in the process of production, the company has brought these papers to a very high standard of excellence. The business has constantly prospered, and the demand for the goods has been so large that the Orient Company has twice enlarged its premises within the brief period of four years — the latter venture being the erection of an extensive wing, 200 feet in length, and 36 feet wide, two stories high.

A very important feature with this company is the universal reputation which it has acquired for prompt service in filling orders — a very important matter to be considered by printers and dealers — and with the increased facilities which will be obtained by the addition of this new and thoroughly equipped mill, the Orient Company has every prospect before it of a larger, more brilliant and successful business. Among the goods manufactured solely by this company are what is known as enameled zincographic papers — invented and perfected solely by the Orient Company expressly for the high speed rotary zincographic press, now being so generally introduced into the largest lithographic houses throughout the country. The papers and card board of the company are sold in every part of this country, through jobbers in paper and lithographers' goods, as well as in Canada and the Indies.

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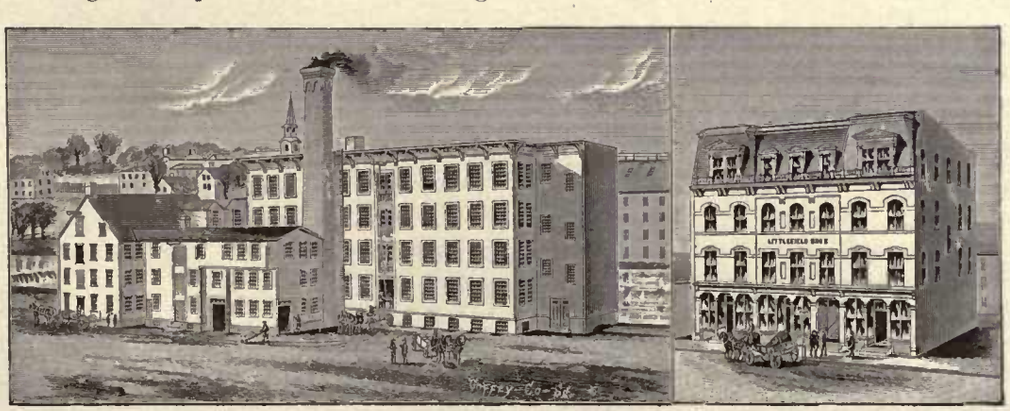
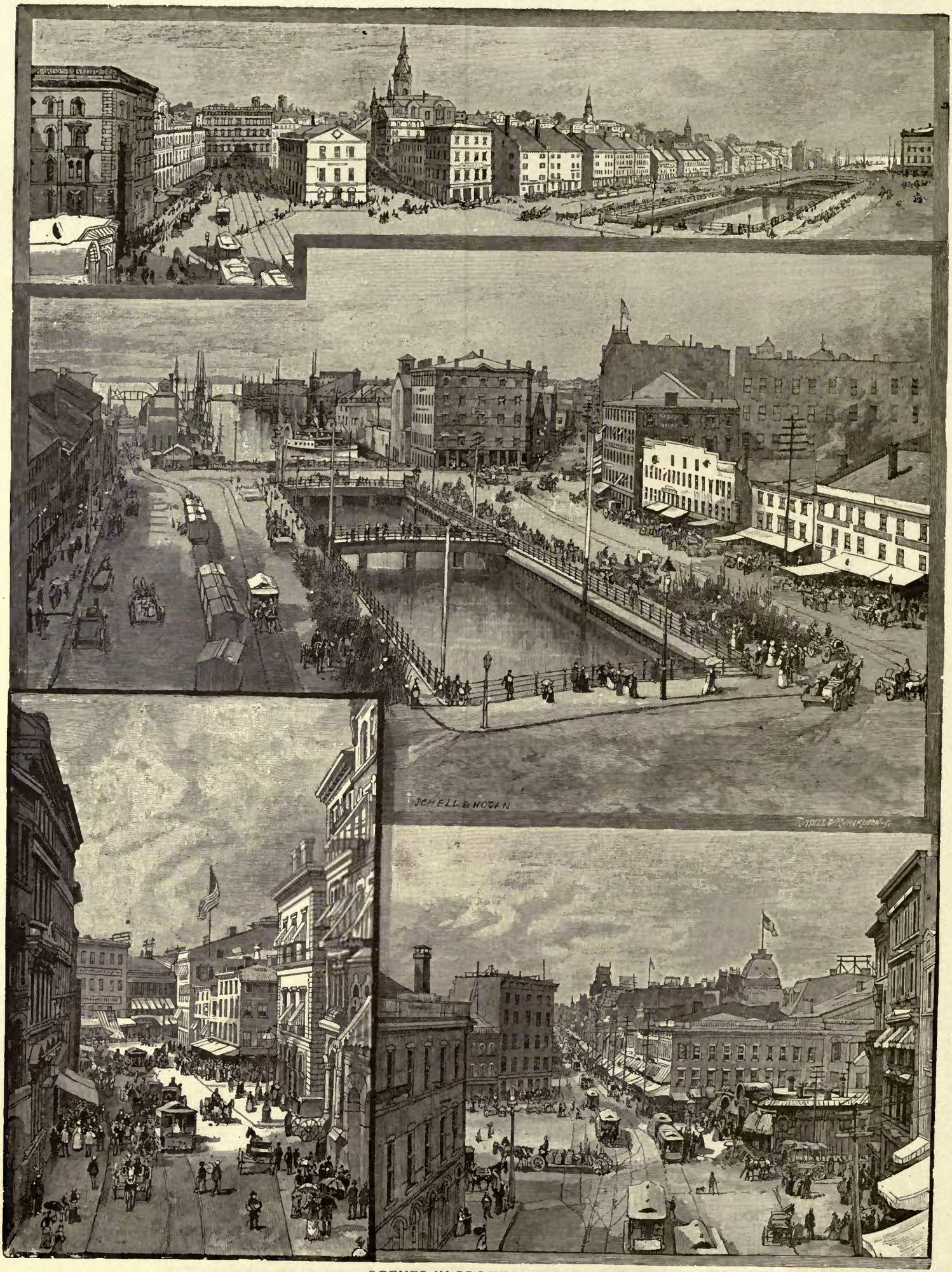
Among other large and representative manufacturing establishments which help make the industrial prosperity of Pawtucket are: the R. Bliss Mfg. Co., makers of archery goods, toys, novelties, etc.; the Pawtucket Steam and Gas Pipe Co.; the Union Steam and Gas Pipe Co.; the Collyer Machine Co.; Robert Plews & Co., card screen manufacturers; B. P. Clapp & Co., manufacturing chemists; Willmarth & Mackillop, contractors; Whittaker & Smith, contractors; J. S. White, founder and machinery manufacturer; the James Davis Belting Co.; the Fairbrother Belting Co.; the Star Tanning Co.; the New England Thread Co.; the Huntington Thread Co.; J. N. Polsey & Co., packing-box manufacturers; Linton Bros. & Co., card manufacturers; John T. Cottrell, manufacturer of finished lumber; the Adam Sutcliffe Co., printers; Cole Bros., builders of steam fire engines; J. O. Draper & Co., manufacturers of washing powders, toilet, laundry and manufacturers' soaps; Atwood, Crawford & Co., spool and bobbin manufacturers; the Pawtucket Tack Co.; J. M. Carpenter, tap and die manufacturer; the L. B. Darling Fertilizer Co.; L. Upham, manufacturer toys and novelties; the Central Falls Woolen Mill; the R. B. Gage Mfg. Co., cotton; Richard Harrison, dyer and bleacher; the E. Jenckes Mfg. Co., ring travelers, belt hooks, etc.; Easton & Burnham, spindle makers and machinists, and the Potter & Atherton Machine Co.



MILL AND OFFICE OF LITTLEFIELD MANUFACTURING COMPANY, PAWTUCKET.



SCENES IN PROVIDENCE.

1. MARKET SQUARE AND SOUTH WATER STREET
2. SOUTH WATER STREET, CRAWFORD STREET BRIDGE, DYER STREET, AND VIEW DOWN THE HARBOR.
3. WEYBOSSET STREET, LOOKING TOWARD WESTMINSTER.
4. MARKET SQUARE, AND WESTMINSTER STREET.

Chapter VIII.

PROVIDENCE AND THE RHODE ISLAND COTTON DISTRICT.

The Influence of Modern Manufacturing—Early Commerce of Providence—Development, Progress and Decline of the Foreign Trade—Rise of Manufacturing—Providence Becomes the Centre of an Extensive Cotton Manufacturing District—The First Mills in the Vicinity—Early Statistics—Beginnings of the Jewelry Manufacture—The First Steam Engines—The Cotton and Other Industries in Rhode Island—Prominent Manufacturers—Location of the Mills in the State—Natural and Acquired Advantages for Manufacturing—Transportation Facilities—The City of Woonsocket, and Its Manufactures—Some of the Leading Manufacturing Establishments Throughout Rhode Island.

THE CITY HALL, EXCHANGE PLACE, PROVIDENCE.

The central fact in the history of the past hundred years is the development of mechanical inventions by means of which the productive power of the world has been vastly increased, and time and distance in a measure annihilated by electricity and steam. Great changes have been evolved by these agencies; men and communities have been brought into new relations; and social and economic conditions have resulted, different from anything in previous human experience. While the whole civilized world has been the arena of this great revolution, certain places have become conspicuous on account of the decisive events of which they were the scene. Pawtucket, as already told, owes her fame entirely to an occurrence of this sort, and the city of Providence, second in population and importance in New England, is indebted for her growth and development to the same cause—the establishing of the cotton manufacture.

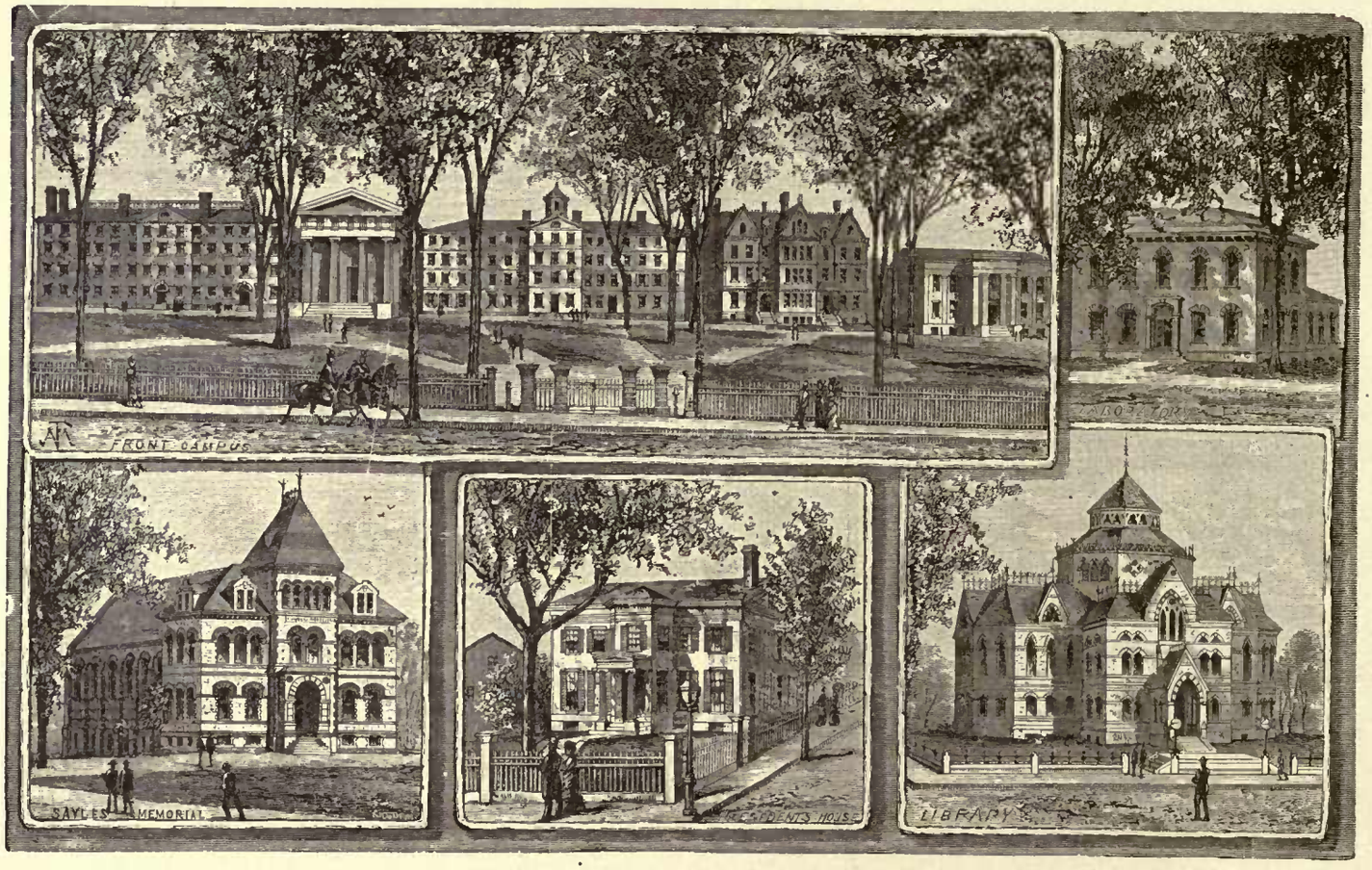
The first occupation, other than farming and fishing, that the settlers of Providence ventured upon, was trading with their neighbors most easily reached by water. At first their numbers were so few and their condition so precarious on account of Indian wars and controversies with neighboring colonies in regard to territorial jurisdiction, that no foreign commerce was attempted and, consequently, when Roger Williams went to England to secure the first charter, he had to sail from the Dutch settlement of Manhattan, now New York. Soon after the charter of Charles II went into effect in 1663, a considerable business was carried on between Providence and the West Indies, but the vessels are supposed to have been owned elsewhere. The first wharf and warehouse was built by Pardon Tillinghast in 1679, on the west side of the Town Street, (the present South Main) and near the foot of what is now Transit Street. The principal export was timber, which was put in fit shape at the few saw mills on the rivers in the neighborhood, while agricultural products also formed a portion of the outgoing cargoes, but Providence was a tributary port to Newport which carried on the chief business with the outside world and owned nearly all the vessels. About the beginning of the eighteenth century other wharves and warehouses were built, and a direct business grew up with West India ports. In a report made to the English Board of Trade in 1708, the statement was made that, in the twenty years preceding, the shipping of Providence had increased fourfold. Within the next twenty-five years the progress was still greater. The population in 1708, was 1,446 but in 1730 had increased to 3,916. In 1764, Providence owned fifty-four vessels of a total capacity of 4,320 tons.

The Revolutionary War, interfered seriously with the commerce of Providence, but did not destroy it as was the case with Newport. After the peace of 1783, a ship of 950 tons was built for the East India trade. In December 1787, the ship *General Washington* sailed from Providence for Canton, China, and was the third American vessel to carry the American flag into the ports of that country At that time, Judge Staples says, "Providence numbered many enterprising merchants among her citizens, commerce was esteemed, and if not the only, was at least the most direct road to affluence." At the beginning of the year 1790, there were owned in Providence 110 vessels of 10,590 tons, exclusive of river craft, and the following

years these had increased to 129 sail of 11,943 tons. This great increase was no doubt owing to the adoption by Rhode Island of the Constitution of the United States in May, 1790, which inspired confidence and abolished all the tariffs that had existed for a number of years previous, between Rhode Island and the adjoining states. A corporation was chartered by the General Assembly for the purpose of river and harbor improvement at Providence, and in a petition from this corporation in 1790, asking for a continuance of its privileges, the statements are made "that there is a greater number of vessels belonging to this port than to New York" and that "it is a place of more navigation than any of its size in the Union."

America the principal imports were rum, molasses, sugar, salt and limes, and from Europe came manufactured articles and cloths. The European trade began to increase about the beginning of the century, and vessels arrived from Liverpool, London, Bordeaux, Copenhagen, Cronstadt, St. Petersburg, Lisbon and other ports. Occasionally ships arrived from even more distant regions,—from Bombay, Calcutta, or some port in Africa or the East Indies.

The war of 1812 seriously affected the trade of Providence, decreasing it from one-half to one-third its former proportions. As a small compensation some of the prizes captured from the British by privateers were brought in and paid duty. After the war commerce revived, soon



BROWN UNIVERSITY, PROVIDENCE.

During 1791, sixty-four vessels arrived from foreign ports, and the duties paid on their cargoes amounted to nearly eighty thousand dollars. Fifty-three of these vessels were from ports in the West Indies, one from Canton, China, one from the Cape de Verde Island, and the remainder from European ports. The trade to Canton, became important. The ship *General Washington* arrived back from her first voyage July 5, 1789, and from that time a continuous trade existed for more than half a century, the last arrival being the ship *Lion*, January 30, 1841. The cargoes from Canton were mainly teas, and in some cases more duty was paid on a single vessel from that port than on all the other goods entered in a year. From the West Indies and South

attained to its former proportions, but with the exception of a year or two, did not increase beyond those limits. After 1831, the foreign commerce constantly decreased, until as a distinct business conducted by home merchants it practically disappeared from Providence. It is true that even at present foreign vessels occasionally arrive, but they bring goods by special order to some of the manufacturing establishments and not as direct importations or on consignment to mercantile and importing houses. These conditions are illustrated by the fact that the number of vessels entering from foreign ports in 1890, was only 139 on which the duties collected amounted to $285,-127.50, and the larger part of the imports consisted of raw materials from the British provinces. In 1819, when

THE DOCKS AT PROVIDENCE.

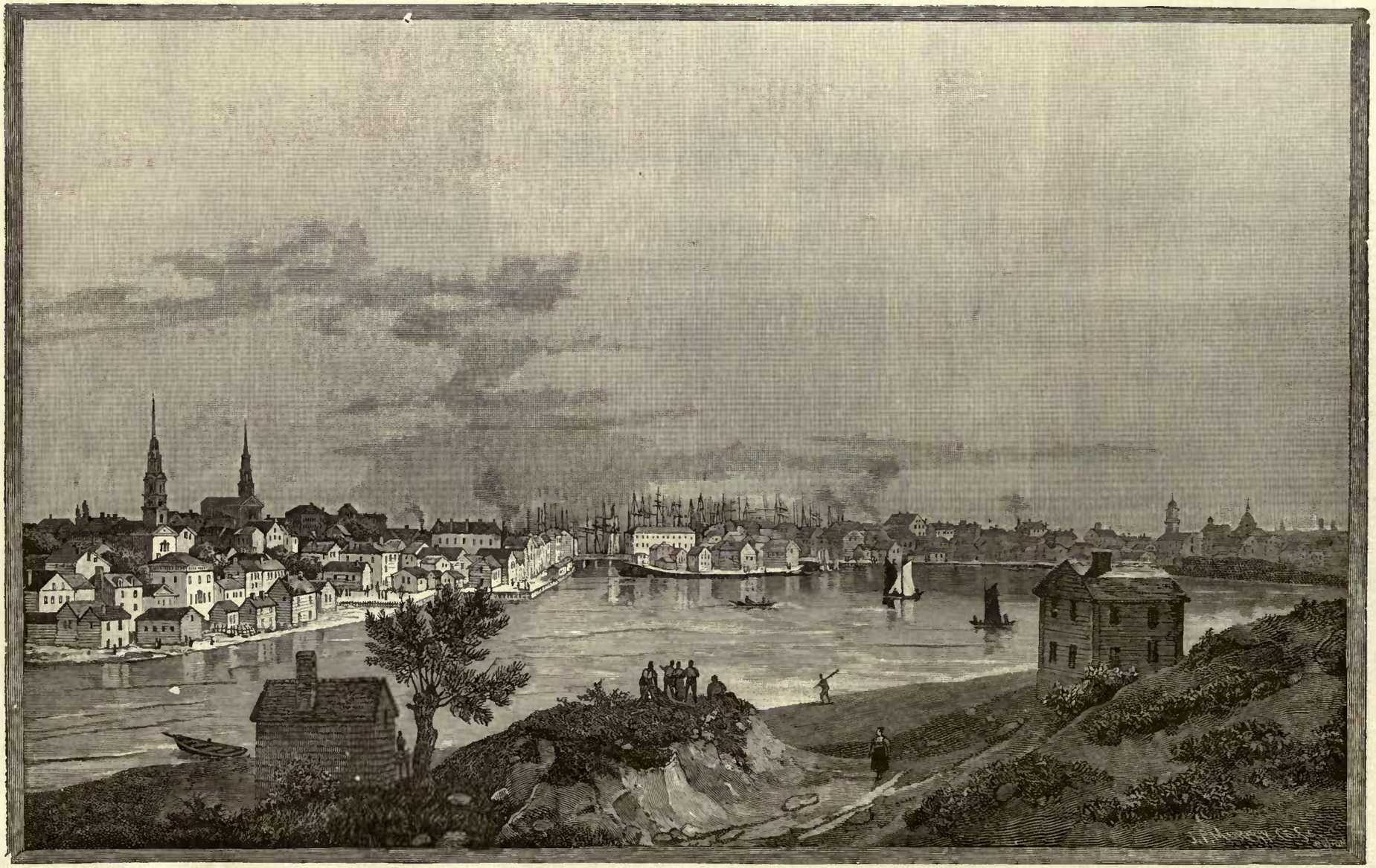
the population of Providence was about one-twelfth what it is at present, the duties paid on imports was about one-third greater.

The chief cause of this commercial decline, without doubt, was the fact that early in the century, and in a more marked degree after the war of 1812, manufactures began to afford a greater and quicker return to enterprise and capital than commerce did. The constantly growing importance of the two ports of New York and Boston, owing to natural situation and other influences, tended to bring about the decadence of the lesser seaports on the New England coast: but although Providence was very materially affected by these general causes, yet the successful establishing of the cotton manufacture in the neighborhood more than made good the loss sustained. Her merchants, having put their capital into mills instead of ships, still continued to conduct business from their home offices. As a consequence all the financial exchanges in connection with the industry were made in Providence, manufacturers of machinery were thereby attracted, and makers of and dealers in all sorts of supplies for the mills found it convenient to locate where they could find their best customers. In this manner Providence became the centre of a large cotton factory district, that comprised not only all of Rhode Island but a considerable portion of adjoining regions in Connecticut and Massachusetts. This position the city continues to hold, and seems likely to sustain to a still greater extent in the future, with the additional advantage that other industries have been established in the same localities, of which Providence is the natural centre, so that at present the city is to a far larger extent than ever before an aggregation of diversified industries and the metropolis of a populous region.

As elsewhere related, the first attempt to spin cotton in Rhode Island by the Arkwright machinery was made in Providence in 1788. At that time the fly shuttle was introduced by Joseph Alexander, and was the means of greatly increasing the efficiency of the hand-looms in use, as is evident from the fact that in 1790 there was woven in the town and immediate vicinity 25,265 yards of linen cloth, 5,858 yards cotton, 3,165 yards woolen, 512 yards carpeting and 260 yards fringe. John Brown, the well-known merchant, in 1789 wore a suit of woolen cloth made from the fleeces of his own sheep, the yarn for which was spun by a woman 81 years of age. Calico printing was begun in 1794 by Messrs. Schaub, Tissot and Dubosque in a building that previously had been a chocolate factory, on the present site of the Franklin foundry. The price of cotton yarn in the Providence market in 1803 was 94 cents a pound for No. 12, $1.10 for No. 16, and $1.26 for No. 50.

YOUNG MEN'S CHRISTIAN ASSOCIATION BUILDING, PROVIDENCE.

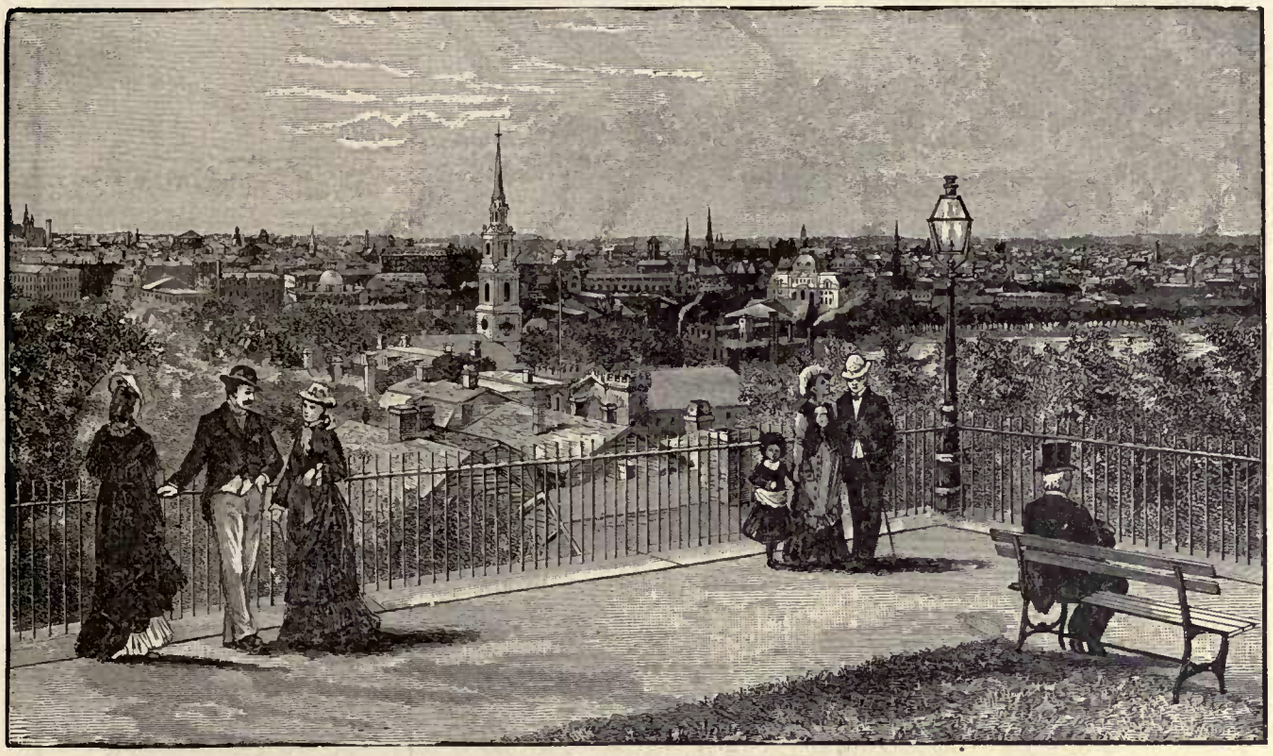
For many years after the industry was started no cotton mills were established in Providence, but all the



FIRST BAPTIST CHURCH. FIRST CONGREGATIONAL CHURCH. BENEFICENT CONGREGATIONAL CHURCH.

PROVIDENCE FROM SMITH'S HILL, 1827.

SHOWING THE COVE AS IT THEN WAS, WITH WEYBOSSET BRIDGE IN THE DISTANCE.



PROVIDENCE FROM PROSPECT TERRACE.

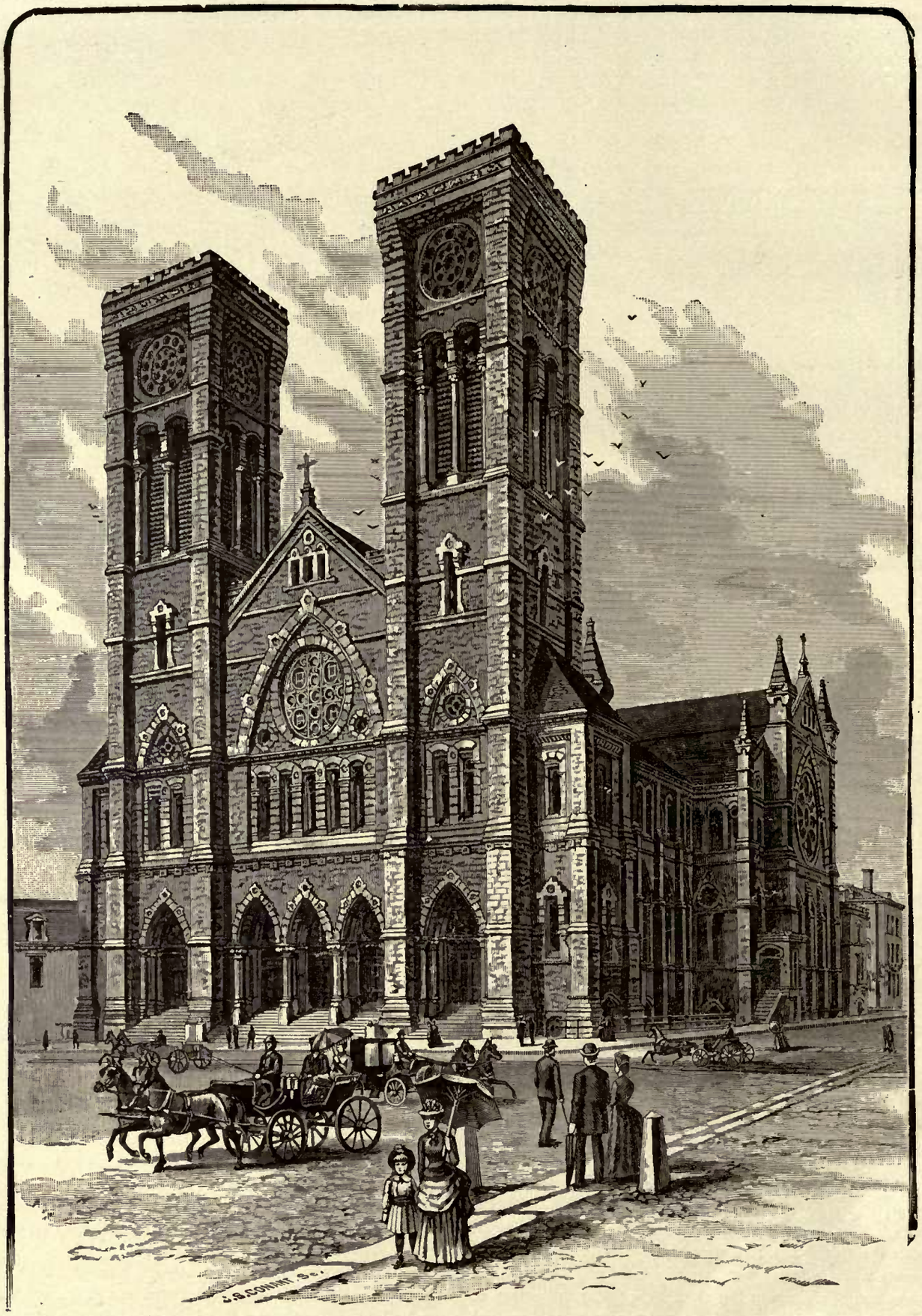
first factories were in the immediate vicinity, many of them in the suburbs, while the majority were in places that had originally been within the territorial limits of the town. Pawtucket was only four miles distant, and had been in the bounds of Providence until 1765, when the town of North Providence was set off. In 1805 the Union Mill was built at Olneyville, on the western boundary of Providence, and on the next water-privilege on the Woonasquatucket River the Merino Mill was erected in 1812. That Providence was always regarded as the centre of the industry is shown by the expressions used in all the early estimates of the number of factories. Thus in 1809 there were in operation "within thirty miles of Providence," 20,406 spindles, of which 14,196 were in Rhode Island, 4,820 in Massachusetts, and 1,390 in Connecticut. In 1811 there were said to be seventeen mills in "Providence and vicinity," with seven in course of erection, and in 1812 the number of spindles in operation in the same district was 120,000. "Within thirty miles of Providence" in 1814, there were 170 factories with over 134,000 spindles, consuming 29,000 bales of cotton annually, and producing 27,840,000 yards of cloth of a total value of $6,000,000.

While the cotton industry was thus increasing, the foundation was also laid for the development of the jewelry manufacture which has in Providence at present attained to a position second only to cotton and its allied industries. The manufacture of silver ware was begun soon after the Revolution; in 1805 there were four establishments where silver spoons, gold beads and finger rings were made, and about the same time the manufacture of cheap jewelry was begun. In 1810, about one hundred workmen were employed, but in 1815 the number had increased to three hundred.

A steam engine constructed by Oliver Evans at his works in Philadelphia, was put in operation in 1812, at the mill of the Providence Woolen Company, the members of which were Samuel G. Arnold, S. Dorr, J. S. Martin, and David Lyman. This mill stood on the site of the Allen Print Works, and the engine is said to have been the first in Rhode Island. The second one introduced was put in by the Providence Dyeing, Bleaching and Calendering Company in 1814. It was of twenty-four horse-power, and was also constructed by Oliver Evans.

The introduction of the power-loom in 1817, occurred at the village of Lymansville, North Providence, only four miles from the bridge in Providence. The number of cotton factories in the district in 1823, was about one hundred, but they were much larger than seven years before, as most of them had in the interval introduced the power-loom. To such an extent, as a consequence, did all the co-related industries in Providence develop that the population which in 1820 had been 11,767, was in 1825, 15,941, an increase of thirty-five per cent. in five years. The Steam Mill was started by Samuel Slater, David Wilkinson and others in 1827, and was the first cotton factory of any considerable size that up to that time had been erected in the limits of Providence. It was also one of the first steam cotton mills in the country, and proving a success, notwithstanding the misfortunes of its original projectors, it afforded an example that was quickly followed here and elsewhere.

The cotton manufacture has always been the leading industry in Rhode Island, and at present probably over one half of the entire capital invested in the state is employed in its various branches. Next in importance are the manufactures of woolen and worsted goods, in



THE SS. PETER AND PAUL'S CATHEDRAL, PROVIDENCE.

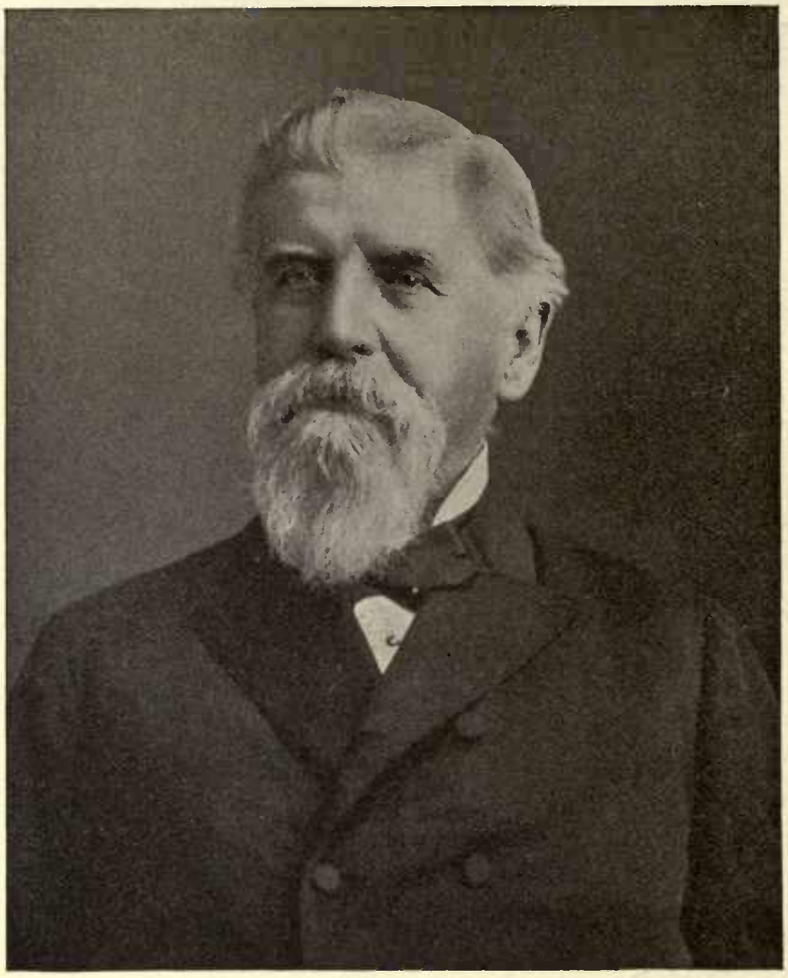
which from twelve to fifteen millions are invested, and these industries are carried on under the same conditions as that of cotton, the mills being situated in the suburbs, and in the river valleys throughout the state, while the offices and selling agencies are located in the city. The machine shops, engine works and other establishments engaged in the working of iron are numerous, and are largely concentrated in the city. The jewelry manufacture rivals the other leading industries, with the exception of cotton, and has a probable investment of from eight to ten millions in establishments wholly in the city limits, the majority of them in the most central parts. In 1860 there were owned in Providence seventy-seven cotton mills located outside the city limits. The same fact is true at present, with the difference that the number is much larger.

RESIDENCE OF R. H. I. GODDARD, PROVIDENCE.

Since 1833 the governors of Rhode Island have nearly all been men prominently identified with cotton manufacturing, instead of, as for a half century previous, with commerce. The same is also true of the men elected to represent the state in the United States Senate. Among the governors have been such well-known manufacturers as Charles Jackson, Elisha Harris, Philip Allen, W. W. Hoppin, Elisha Dyer, the two William Spragues, Henry Howard, Henry Lippitt, A. H. Littlefield and Royal C. Taft, while among the senators are many of the same names, and in addition such men as John H. Clarke, Charles T. James, James F. Simmons and Jonathan Chace. The lieutenant-governors and other state officers have also been drawn largely from the same class.

RESIDENCE OF B. B. KNIGHT, PROVIDENCE.

For years after the beginning of the cotton industry Rhode Island was the home of the manufacture. Although at present there are no localities in the state that will alone equal Fall River and Lowell, or even New Bedford, Lawrence, and Manchester in the extent and compactness of their manufacturing establishments, still the entire vicinage in the neighborhood of Providence, within a quite limited radius, contains more manufacturing than any other locality in the country with the exception of Fall River and the two cities on the Merrimack — Lowell and Lawrence. In fact as a cotton manufacturing district Rhode Island ranks third. The factories are chiefly located in the river valleys, more than half of



ROBERT KNIGHT,

OF THE FIRM OF B. B. & R. KNIGHT, COTTON MANUFACTURERS, PROVIDENCE.

the entire amount of manufacturing being carried on in the Blackstone valley. Pawtucket is the first and most important place, and then follow in rapid succession, the villages of Central Falls, Valley Falls, Lonsdale, Berkeley, Ashton, Albion, Manville, and the city of Woonsocket —all in Rhode Island—while beyond, across the border in Massachusetts, but most of them by business conditions within the limits of the Rhode Island cotton district, are the villages of Blackstone, Millville, Uxbridge, Whitinsville, Northbridge, Farmunsville, Saundersville, Wilkinsonville and Millbury. On the Branch River, which unites with the Blackstone above Woonsocket, and drains a district almost wholly in Rhode Island, are the villages of Forestdale, Slatersville and Mohegan; on the Clear River, as the upper part of the Branch River is called, are Harrisville and Pascoag, the latter one of the largest manufacturing villages in the state; on the Chepachet a stream running into Clear River, are Oakland, Mapleville and Chepachet. On the Abbott Run, a small stream which unites with the Blackstone above Pawtucket, is the village of Cumberland Mills, where one of the first cotton spinning mills was erected. Another tributary of the Blackstone, Ten Mile River, flows into the Seekonk two or three miles south of Pawtucket, and on it are the villages of Rumford, Hebronville, Dodgeville, and the important manufacturing town of Attleboro.

Next in importance in the State is the Pawtuxet valley, which is dotted for a score of miles with villages and factories. At its mouth, in the village of Pawtuxet, there was formerly a small mill which was bought by the city of Providence at the time of the introduction of Pawtuxet water. Pontiac is the first place where the water-power is made use of. Next comes Natick with its five mills and high stone dam. At River Point, two miles above Natick, the two branches of the river unite. On the southwest branch are River Point, Arctic, Centreville, Crompton, Quidnick, Anthony, Washington, and Coventry Centre. On the northwest branch are Clyde Print Works, Lippitt, Phenix, Harrisville, Arkwright, Fiskeville, Jackson, Hope, Rockland, North and South Scituate.

The Woonasquatucket valley, while not as busy a region as either the Blackstone or the Pawtuxet valley, has yet a considerable amount of cotton manufacturing and the villages along this river and its upper waters are Olneyville, Merino, Dyerville, Manton, Lymansville, Allendale, Centredale, Graniteville, Allenville, Enfield, Georgiaville, Stillwater and Greenville.

In the southern part of the state the Pawcatuck is the only considerable river, and the manufacturing villages on this stream and its branches are Westerly, White Rock, Ashaway, Niantic, Rockville, Richmond Switch, Carolina Mills, Shannock, Potter's Hill, Hope Valley, Woodville, Wyoming and Arcadia. Westerly and Hope Valley are the two most considerable places in the southern part of the state.

There are many important establishments throughout the state on smaller streams and at the mouths of rivers. Among these may be mentioned those on the Pocasset, a branch of the Pawtuxet River, at Cranston and Thornton, (formerly Simmonsville); the establishments in the north part of Providence on the Moshassuck and West rivers; and the mills at Bristol, Warren, East Greenwich, Peace Dale, Wakefield, Davisville, Lafayette, Wickford, and elsewhere.

It would be impossible within reasonable limits to enter into details in reference to the various mills in the city and throughout the state. The origin of many of them has been narrated in the chapter on pioneer manufacturers. In the city limits the principal establishments engaged in the cotton business are the Fletcher Manufacturing Company, the Oriental Mills, the Grant Mill, the Whitestone Mills, the Elmwood Mills, the Steam Mill, now called the Nottingham, the Allen Print Works, the Barstow Thread Company, the Providence Dyeing, Bleaching and Calendering Company,

the Rhode Island Bleach and Dye Works, the Silver Spring Bleaching and Dyeing Company, and the Valley Bleachery.

Both in respect to natural and acquired advantages for the carrying on of the cotton manufacture, Rhode Island is probably not excelled by any other section in the country. Although the sites along the rivers available for mills have been preëmpted, still there are innumerable locations that under present conditions are just as well adapted for the purpose. Nearly all the factories at present existing were built at a time when water-power was considered essential, but now almost any position on the rivers could be utilized, since the motive-power would be furnished by steam or electricity, and the water supply is abundant for all other necessary purposes. Parallel with every important stream and along the banks of many of the lesser rivers, railroads run, so that every village and mill, and nearly all parts of every river valley are readily accessible. The Worcester Division of the New York, Providence & Boston Railroad runs through the valley of the Blackstone; the Pawtuxet Valley division reaches all the places on the north branches of the Pawtuxet River, while the New York & New England Railroad performs the same service for the other branch; the New York, Providence & Boston Railroad affords transportation facilities to all parts of southern Rhode Island through its main line and branches to Wickford, Narragansett Pier and Hope Valley; the Providence and Springfield Railroad reaches all the villages in the valley of the Woonasquatucket, and the Warren & Bristol Division of the Old Colony reaches the two important places that its name indicates. With these important factors in her favor, and the added advantage, in the opinion of cautious and well-informed observers, that the local climatic conditions are extremely favorable for the manufacture of cotton, there is no reason why Rhode Island

THE DOYLE MONUMENT, PROVIDENCE.

should not only continue to hold her relative position, but should outstrip other localities and lead in the cotton manufacture in the future as she did in the first quarter of the century.

The great increase of wealth in Providence that accompanied the growth of the cotton and other industries has been the means of developing all the conveniences and advantages essential to city life and progress. An excellent system of water works has been in operation since 1871. For many years the sewerage of a large portion of the city has been in a very good condition, but a comprehensive scheme embracing the whole city and its environs is now in progress, and when completed will place Providence in the front rank in this respect among the great cities of the world. In 1872 a tract of land of over one hundred and ten acres was given to the city by Miss Betsy Williams, who had inherited the property in direct line from her ancestor Roger Williams. This now constitutes Roger Williams Park. Between Smith's Hill and Mount Pleasant a large estate was purchased in 1890, for use as a park. There are, beside, various small enclosures scattered throughout the city that serve as "breathing spaces" for the constantly increasing population. Although the central portions are located on the hill-sides overlooking the confluence of the rivers, yet the city has spread out over the plains extending in all direction, and these regions, are now residential sections, chiefly occupied by unpretentious but comfortable homes. All these suburbs are park-like in character, as most of the houses are in separate grounds, even those on the side streets, and the streets are all lined with trees, while around the houses trees and plants flourish in the majority of instances. On some of the main avenues are beautiful mansion houses embowered in trees and surrounded with well-kept lawns, and on the East side these residences particularly abounded. Many of the palatial mansions in this latter neighborhood are the homes of the wealthy manufacturers, and in architectural style and elegance will compare favorably with any similar homes elsewhere. In the line of educational facilities, Providence can boast of Brown University, of the Friends' School, and of other well-known institutions. The public schools are admirably conducted, the buildings being as a rule beautiful brick structures, fitted up with the latest conveniences and apparatus. The city is well supplied with social, religious, fraternal and other institutions based on unity of action on the part of large numbers in the community. The improvement of the railroad terminal facilities, so long delayed, is now actively in progress. When this improvement and others less important are added to existing advantages, a great and prosperous future undoubtedly lies before Providence, it will become even more desirable as a place of residence than at present, and as a business centre will have unsurpassed advantages.

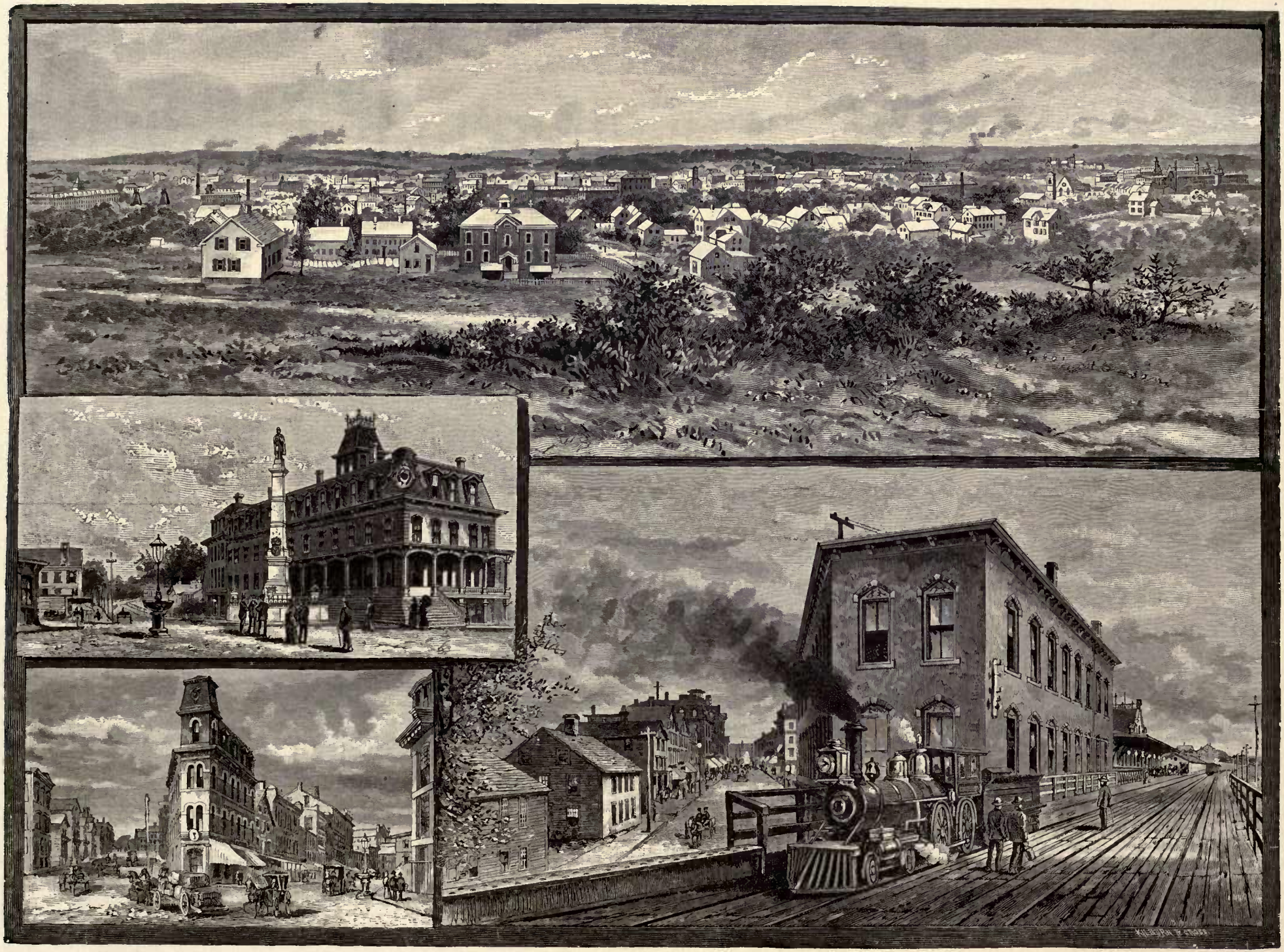
* * * * *

Sixteen miles from Providence, on the Blackstone River, is the city of Woonsocket, which, after Providence and Pawtucket is the most important manufacturing place in Rhode Island, and on this account is deserving of an extended mention. It now has a population of nearly twenty thousand. The Blackstone River here has a total fall of about thirty feet over three dams, and the tributary streams, the Mill and Peters rivers which here unite with the Blackstone, have falls respectively of sixty and fifty-two feet. These together constitute the best water-power in Rhode Island, which is quite thoroughly utilized for manufacturing purposes. The leading industry is the cotton manufacture, which is carried on in all its branches. A larger amount of cloth is probably produced here than in any other place in the state. The woolen manufacture is also carried on extensively. There are, in addition, a variety of manufactures, among which are those of rubber goods, knit goods, sewing machines, shuttles, bobbin and some others.

The growth of the manufacturing business in Woonsocket, as it exists at the present time, dates from 1810. There had been, previously, a saw mill, dating back to 1666, a corn and fulling mill, and an old forge, built somewhere about 1720. The first use of the Woonsocket waters as a motive power was on the Blackstone, where the saw mill was built, the second on Peters River, and the third on Mill River. In 1807, a freshet which was so remarkable as to be a historic one for Woonsocket, swept away or disabled all the buildings on the banks of the waters of the place. At this time the proprietors of the water-privileges were James Arnold, Stephen Wilcox and Joseph Arnold—the first owning that of the Blackstone, the second at Peters River, and Joseph Arnold at Mill River. where, and by the assistance of the owners, the first cotton mill was started in 1810.

All the land on which water-privileges existed came down by inheritance from Richard Arnold, who built the original saw mill, and Joseph Arnold was one of the incorporators of a company called the Social Manufacturing Company, which was formed October 24, 1810. Mr. Arnold sold to the company the original lot, consisting of four acres and twenty-five rods, on which a small wooden structure was erected—now a part of the boarding house at that place. There were eight incorporators in the Social Company, each person being limited to two shares. This mill was known for a long time as the "Pistareen," and contained 2,000 spindles. There were many changes in the company; first in 1814, and the Jenckes, who were among the original proprietors, disposed of their rights in 1822, and began operations at Peters River, now known as Jenckesville. The first stone mill was built in Woonsocket in 1822—the second in 1828. The Social Manufacturing Company built a second wooden mill in 1827, which is now a part of a tenement house and is known as the "Castle." In 1839, Mr. Arnold and Mr. Earle, also one of the first stockholders, became owners in common of the plant. In 1840, the company was in insolvency, and the property came into the hands of Dexter Ballou, who had come to Woonsocket in 1817, and Mr. Ballou with his brothers did much towards the prosperity of the town in its early days, carried on the mill first as assignee for Arnold & Earle. In 1841, he bought the property for $25,000, and began the erection of a stone mill. In 1855, this property was bought by Henry Lippitt, and the present Social Manufacturing Company was formed.

James Arnold was proprietor of the water-power at

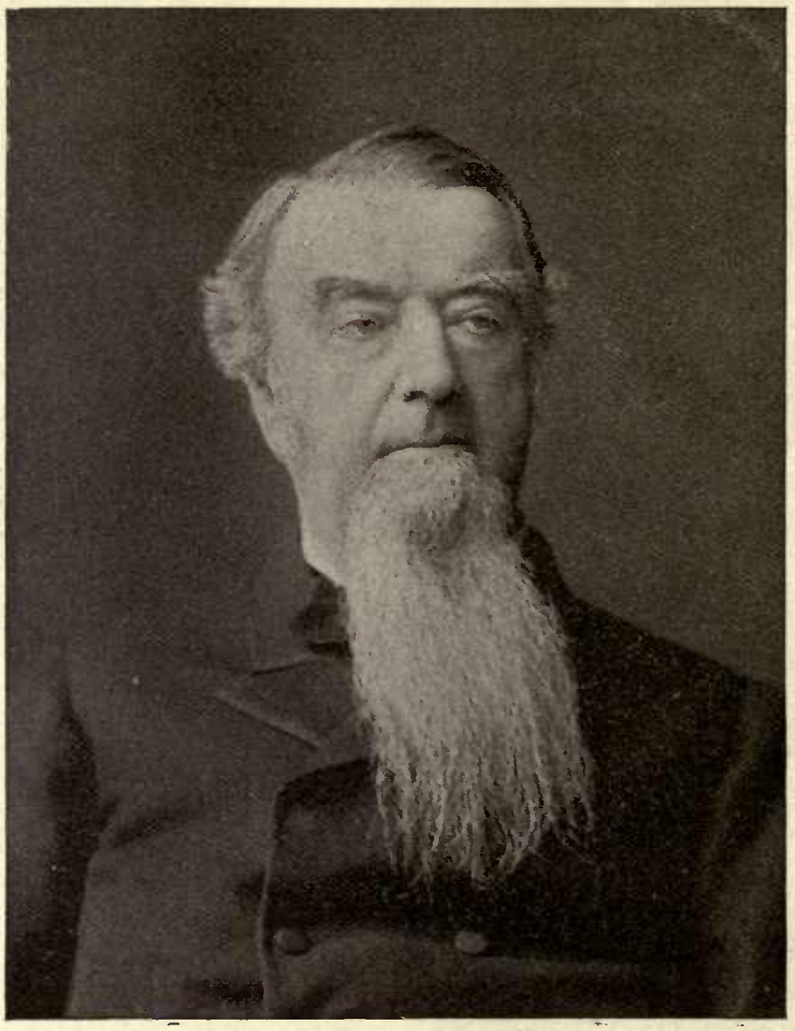


VIEWS OF WOONSOCKET.

1. GENERAL VIEW OF WOONSOCKET. 2. MONUMENT SQUARE. 3. MARKET SQUARE. 4. MAIN STREET AND R. R. STATION.

the Blackstone. He was not a manufacturer, but greatly assisted in the progress of manufacturing interests here by building mills and shops which were let to other parties. The sites of his buildings have become historic locations; on them and other portions of land belonging to him, industries were begun which have made Woonsocket what she is to-day. On one of them Edward Harris, begun in a small way, that enterprise which is known wherever woolen goods are manufactured into clothing; here also the Ballous carried on their industries, and the largest mill, that built by George C. Ballou on land obtained from James Arnold, has now, like the mill property originally derived from Joseph Arnold, passed into the possession of Henry Lippitt and the Social Manufacturing Company. Immediately after the freshet, James Arnold began the erection of shops, the second one being built in 1810—the only historic value of which consists in the fact that here Welcome Farnum first begun his career as a woolen manufacturer. The third mill, built in 1812, was occupied by W. & D. D. Farnum for making satinets; it was burned in 1829, and March 26, 1831, the property came into the possession of Edward Harris. This is where he began operations, and the building, which is still in existence, is known as Harris Mill No. 1. The fourth building was erected in 1814. Here Dexter Ballou began to spin cotton, and here a self-operating mule was in operation. In 1821, this was conveyed to Daniel Lyman, and has been known since that time as the Lyman Mill. After this mill had been leased to Lyman, Dexter Ballou hired the old saw mill from James Arnold, and with his father began manufacturing. In 1827, he and his brother Hosea owned the right; in 1828 Dexter bought the whole, and in 1829 the mill was burned. After the fire he erected a brick mill—the first improvement on this lot. A wooden building for a storehouse, and one for a machine shop was put up and in 1835 these wooden buildings were destroyed by fire. The following year Mr. Ballou erected a stone mill and connected it with the brick mill, and the whole was known as the Harrison Mill until 1865, when it came into the possession of Ex-Governor Lippitt.

James Arnold died in 1827, and his estate was divided into twenty lots—the heirs of S. G. Arnold taking certain lots, and the heirs of Daniel Lyman others. On lot No. 3 stand the woolen mills of the Harris Manufacturing Company. Mill No. 2 was built in 1840; mill No. 4 in 1846, and in these mills Edward Harris earned his reputation for the goods which are known by his name. The large mill on Mill River was built in 1865. The Groton Manufacturing Company occupies lots No. 8, 9 and 13. These lots were first leased to John W. Buffum, and two mills erected called Buffum's and Law's. The property passed from Buffum to Peter J. Cook and Samuel Shove; thence to A. D. and J. Y. Smith and their successors. The Lyman heirs sold six of these lots to Benjamin and Thomas C. Hoppin in 1827; in 1830 the property was conveyed to Edward Carrington, and in 1845 to George C. and O. A. Ballou, with others. This is the site of the Clinton Mills. Before Mr. Arnold died he sold a large tract of land to Thomas Arnold, Thomas A. Paine and Marvel Shove, who were the original proprietors of the stock of the Globe Manufacturing Company. After many vicissitudes this property was owned by George C. Ballou in 1864. On this site Mr. Ballou built his elegant new mill to replace the one which had been destroyed by fire, and after his death the property came into the hands of the Social Manufacturing Company.



B. B. KNIGHT,

OF THE FIRM OF B. B. & R. KNIGHT, COTTON MANUFACTURERS.

The mills occupied by the Social Manufacturing Company have been enlarged and new ones erected. The Harris Woolen Company has an extensive plant, and its business has not materially decreased since the death of Mr. Harris. The Woonsocket Rubber Company, which started in 1864 in a small way, in an old planing mill, has developed until a large mill, one of the finest in the state, has been erected for the manufacture of a portion of the goods made by the company.

The name Woonsocket was originally applied to the compact village in the town of Cumberland, on the east side of the falls. In 1867 this village with the neighboring village of Social and adjoining territory was set off from Cumberland and incorporated as the town of Woonsocket. In 1871 the west side, consisting of the villages of Globe, Bernon and Hamlet, were set off from Smithfield and added to the town. A city charter was adopted by vote of the electors, November 6, 1888, and the first city government was inaugurated January 7, 1889. The Blackstone River, spanned by seven highway and two railroad bridges, flows in a semi-circular course through the city.

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In the following pages accounts are given of a number of the concerns in Providence and the Rhode Island manufacturing district, that have been prominently connected with the growth of the community, and whose history is constantly a matter of interest when the cotton and other industries are alluded to.

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The firm of B. B. & R. Knight, whose offices and headquarters are in Providence, carries on the cotton manufacture on a larger scale than any other firm or corporation in the country Its growth has been remarkable, and the development of the cotton mills, from the first purchase of the Pontiac Mill by Robert Knight to the large number at present owned and operated by the firm, has been brought about in a single generation. The members of the firm to-day are its original members. None of the property or business has come by descent to either member of the concern, but the entire plant is the result of a shrewd and successfully conducted business.

The firm of B. B. & R. Knight originated in 1852, and began business at Pontiac, previously known as Clarksville. The original mill here was erected before 1820, and after it had been run unsuccessfully by its owners, it came into the possession of John H. Clark, who gave to the vicinity of the mill the name of Clarksville, erected in 1834 a stone mill and a large bleachery and carried on the business until 1846, when he was elected to the United States Senate. The mills were then leased to Zachariah Parker who had been superintendent and Robert Knight who had been a clerk in the store, and a partnership was formed. In 1850, Parker & Knight purchased the property; the following year Mr. Knight bought out his partner's interest, and in 1852, sold half of the business and property to his brother. Thus the firm of B. B. & R. Knight was begun. Robert Knight gave the name of Pontiac to the property as soon as it came into his possession.

STEPHEN A. KNIGHT,

OF THE HEBRON MANUFACTURING COMPANY.

Robert Knight was put at work in the Cranston Print Works at the age of 8 years, and later worked in the Coventry Cotton Mill until he was 17 years of age. Thence he entered the store of his brother in Providence, in 1843, remaining two years, and after a year or more at the Pawcatuck Academy, Westerly, R. I., he entered the factory store of Mr. Clark in Warwick, soon entering into the partnership with Zachariah Parker, as mentioned. Benjamin B. Knight, the older brother, began business as a grocer in Cranston; thence removing to Providence where he built up a successful trade. In 1846 he entered

the commission business, dealing largely in flour, which he continued until he purchased a half interest in his brother's mill and property at Pontiac, becoming in 1852 the senior partner in the firm of B. B. & R. Knight.

The second purchase of the firm was the mill property located in Attleboro on what was called the "Ten Mile River," and which has since grown to the village of Hebronville. Repairs and enlargements were begun, when the mill was struck by lightning and burned. A large brick mill was then erected, which contained 5,000 spindles, and was put in operation July 1, 1854. The same year the mill property one mile above Hebronville, known as Dodgeville, was purchased — a cotton factory which was built in 1809, and was one of the oldest in Massachusetts. The business here had been successful, and the mill contained nearly five thousand spindles. After its purchase by Messrs. Knight it was enlarged and the tenements put in repair, and later still further enlargements have been made. These mills and property, together with the Grant Mill on Carpenter Street in Providence, which was originally built for a hat factory, but was purchased in 1871 by Messrs. Knight, are run under the style of the Hebron Manufacturing Company, and produce the cotton shirting known as the "Fruit of the Loom." The bleachery has been several times enlarged, and the stone mill built by Mr. Clark at Pontiac in 1834 was torn down in 1863, and a substantial brick mill, 250 x 66, with an ell 90 x 40, having a capacity of 21,000 spindles, was erected; and in 1866 a brick building, used as a factory store and a hall where social and religious meetings are held, was built by the Messrs. Knight.

In 1872 the firm obtained a controlling interest in the Manchaug Mills in Sutton, Mass., on a branch of the Blackstone. These mills were built in 1828, and, after many enlargements, the product was increased so that, in 1876, under the Messrs. Knight, 6,400,000 yards of "Fruit of the Loom" cotton were made, instead of 640,000 in 1835. In 1874 the White Rock Mill in Westerly, up to that time the largest mill under one roof in the possession of the firm, was purchased. This mill, built in 1826, contained 10,000 spindles, but was afterward enlarged to a capacity of 27,000 spindles.

In 1876 the firm purchased from the estate of George C. Ballou, in Woonsocket, the principal interest in the Clinton Mills, of that place, which at that time contained 15,000 spindles. This has also been increased and new machinery put in place. In 1877 the Fiskeville factory, in Scituate, one of the oldest mills in the state, was purchased. At that time it contained only 4,000 spindles.

The purchase, in 1882, of the Natick Mills from the Sprague estate, gave Messrs. Knight the largest mill operated by them, and it is one of the largest cotton mills in the country. As carried on by the Spragues there were four separate mills, but they have been united in one mill with additions so that one continuous roof covers a factory 1,183 feet long and six stories high. Two thousand operatives are employed at this mill alone. The Arctic Mill was purchased from the Sprague estate in 1885. The three River Point Mills and the old mill at Lippitt came into their possession a few years later. All these mills have been enlarged and improved, and according to official reports in 1889 the total number of spindles in all the Messrs. Knights mills was 369,520, nearly one hundred thousand more than is operated by any other concern in the country.

Notwithstanding an exceedingly busy life both members of the firm have found time to devote to other services. In 1852 B. B. Knight was elected to the General Assembly, and again in 1872, when he was chairman of the finance committee in the lower house. Robert Knight has been a director of the National Bank of Commerce for years, and was an incorporator of the People's Savings Bank, of both of which he is now president.

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The plant of the Fletcher Manufacturing Company, on Charles Street, in the north part of Providence, is undoubtedly the largest, in the line of goods manufactured, in this country. The works cover more than four acres, and the principal productions are boot, shoe and corset lacings, lamp and stove wicks, various kinds of twines and braids, braided and twisted spindle banding, and yarns, from twenty to sixty, in skeins, on spools, or ring tied. The company was incorporated in 1865, with a paid up capital of $300,000. The business, which was the origin of the extensive plant now operated by the company, was begun in Boston in 1793, by Thomas Fletcher, who came from England, and had been thoroughly trained in the weaving of narrow goods, such as tapes, fringes, lamp wicks and the like. When the Argand lamp was first introduced, he met the demand for wicks by beginning their manufacture at once, and in 1808 he removed to Providence, where the industry was continued with success, until his death, in 1824. His sons took up the business, beginning, in 1826, the manufacture of boot, shoe and corset lacings, and in 1840 the firm, which was then known as Fletcher Brothers, occupied a mill on Charles Street known in the early history of the city as the "town grist-mill." Here the spinning of yarns was begun, and in 1844 the firm purchased the land now occupied by the company and erected its first building. When petroleum was discovered and kerosene oil began to be extensively used, the demand for lamp wicks was enormous, and still continues. The goods of the company are sold and known all over the country, and over seven hundred operatives are employed. The officers of the company are William B. Fletcher, president; William Ames, secretary and treasurer.

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The Providence Dyeing, Bleaching and Calendering Company is one of the industries whose origin dates back to the early part of the century. It was formerly known as the Patent Calender Company, and was started on Sabin Street in 1814 by John B. Mason, Benjamin Dyer, Charles Dyer, Benjamin Hoppin, T. C. Hoppin, Henry Hoppin, Elisha Dyer, Smith Bosworth, Olney Dyer and Hercules Whitney. The present company was incorporated in 1842, and in addition to the older manufactory on Sabin Street, which occupies over an acre of land, increased accommodations were secured in a smaller factory in Olneyville. The bleaching and finishing of shirt

ings, nainsooks, lawns, cambrics and similar goods has been the business of the company, and its reputation has been the highest from the beginning. Dyeing has not been done at the works since 1885. The capacity of the works is eight tons per day. Charles A. Hoppin is treasurer, and John P. Farnsworth agent of the company. Its incorporated capital is $192,000.

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The Whitestone Mill, situated on Dexter Street, is carried on by an incorporated company of which Francis M. Smith is president, and Amos D. Smith is treasurer; and this company succeeds the old firms of A. D. Smith & Company, and A. D. & J. Y. Smith & Company,—both being pioneer cotton manufacturers in Rhode Island. Amos D. Smith, the founder of these firms, was born in Groton, Conn., in 1805, and after some experience in the wholesale grocery business he started in 1828 a small cotton mill in Johnston with a few hundred spindles, sending the yarn into the rural districts to be woven on hand looms. After some years he became interested in the Union Mill, owned by his father-in-law, Henry P. Franklin; and in 1848, with his brother-in-law, Charles H. Franklin, he purchased an interest in the Merino Mill at Johnston, adjoining his other mill there. In 1850, the interest of all parties in these three mills was consolidated and an incorporated company formed by Mr. Smith, Charles H. Franklin and the heirs of Henry P. Franklin. In 1843, Mr. Smith formed a partnership with his younger brother James Y., who had been in the lumber business, and the firm of A. D. & J. Y. Smith was the representative, from that time, of the manufacturing interests in which each of the brothers had invested capital. It also did a general wholesale business. In 1845, the firm purchased the mill in Willimantic which Thomas J. Hill had fitted with machinery and this was called the Smithville Manufacturing Company. The interest of other parties in a mill in Woonsocket, called the Groton Mill, and afterwards Law's Mill, was also bought, and a charter obtained for this enterprise under the name of the Groton Manufacturing Company. In 1856, Henry J. and Francis M., two sons of A. D. Smith, were admitted to the firm, and the concern then bought the Providence Steam Mill, which was started in 1827 by Samuel Slater and after a series of vicissitudes had been sold at auction. In 1862 James Y. Smith retired from the firm, the third son of A. D. Smith was admitted, and the style became A. D. Smith & Company. In 1865, the mill on Dexter Street, now called the Whitestone Mill was purchased. It had formerly been the State Arsenal, later the Durfee Mill, and being run by Messrs. Smith in connection with the Groton Mill, was called the Groton Mill No. 2. Amos D. Smith died in 1877, and the business was carried on by his sons under the same name. On the retirement of James Y. Smith from the old firm, he began business in his own name, and after the war erected a cotton mill in that part of Cranston called Elmwood, now a part of Providence, and which is known as the Elmwood Mill. The business conducted in this mill was organized as the J. Y. Smith Manufacturing Company, and produced the Elmwood shirting, which has always maintained an excellent reputation. In 1863, Mr. Smith was elected governor of Rhode Island, and during the time which was the most eventful and important in the history of the state in connection with the suppression of the Rebellion, Governor Smith rendered efficient service by his ability to cope with the extraordinary exigencies of that period, filling all the quotas of the state by voluntary enlistments, and avoiding the necessity of a draft; he was re-elected in 1864-65 — the latter year by a majority from every town and ward in the state, a case believed to be unparalleled in any state in the Union. In 1866, Charles A. Nichols, Mr. Smith's son-in-law, was admitted to the firm, which became James Y. Smith & Nichols, and in 1873, on the admission of Horatio Rogers, who had married the younger daughter of Mr. Smith, the style of the firm was James Y. Smith, Nichols & Rogers. On the death of James Y. Smith in 1876, the business was carried on by the surviving partners until the death of Mr. Nichols in 1877, after which General Rogers carried on the mills for a time under the old firm name. The Elmwood Mill is now in the hands of other parties. When the Messrs. Smith came to Providence the manufacturing industry was in its infancy; the population of the city was scarcely fifteen thousand; they lived to see Providence one of the most important manufacturing centres in New England, its population having increased nearly eight-fold, and its wealth in still greater proportion.

THE LIPPITT MANSION, PROVIDENCE.

ST. JOHN'S EPISCOPAL CHURCH, PROVIDENCE.

GROSVENOR-DALE COMPANY, WILLIAM GROSVENOR.—The germ of the extensive mills, now owned by the Grosvenor-Dale Company, was a small factory in Thompson, Conn., established early in 1812, by John Mason, a farmer of that town, with four of his neighbors and his brother, General James B. Mason, a merchant of Providence. They purchased land and a mill-privilege on the French River, March 3, 1812, and erected a factory, sixty feet long, thirty-six feet wide, and three stories high, and equipped it with machinery having 1,600 spindles. In a little more than a year, General Mason became sole proprietor, and sold one-half to his brothers, William H., and Amasa, also merchants of Providence.

General Mason having died, his widow, Alice, and William H. Mason leased their respective shares to Amasa Mason, who then commenced an active relation to the business which subsisted for some twenty-seven years.

In 1826, on the 27th of January, Amasa and William H. Mason bought the mill-privilege about a half a mile higher up the stream, and erected a factory of stone, eighty feet long, forty feet wide, and four stories high, with machinery of twenty-five hundred spindles. They organized the business under the name of the Masonville Company. In 1831, a brick factory was erected, ninety-two feet long, forty feet wide, and four stories high, and also having twenty-five hundred spindles.

In 1840 the old factory of 1812 was increased in length one hundred feet, the old machinery being replaced by new, increasing the number of spindles to twenty-seven hundred.

The health of Amasa Mason having failed, he retired from business in 1848, and died November 13, 1852. He was succeeded in the management of the business by William Grosvenor.

William Grosvenor was born in Killingly, Conn., April 30, 1810, and was educated for the medical profession, which he practiced for some years in his native town. On his marriage to Rosa Anne, daughter of James B. Mason, which occurred August 22, 1836, he removed to Providence, and commenced there the practice of his profession. His tastes, however, inclined him to mercantile pursuits, and in a short time he engaged in business as a wholesale merchant in drugs and dye-stuffs. He afterwards engaged also in calico-printing, which he carried on till 1860. In 1854 and after, he bought all the stock of the Masonville Company, except one and seven-eighths shares belonging to his wife. In 1859, a structure was erected at the upper privilege, uniting the original stone factory of 1826 with the brick factory of 1831, increasing the capacity to eleven thousand spindles. In 1862, the wooden mill at the lower privilege was removed, and the erection of a factory of brick, one-hundred and sixty feet long, sixty-six feet wide, and five-stories high, with an ell, eighty feet by forty, was commenced on its site. It was put in operation in 1865, with *about* nineteen thousand spindles.

The village, one and a half miles north of Masonville, was known till 1868 as Fisherville. A cotton factory had been established there by William Fisher and others. The property was purchased March 31, 1864, and in 1868, consolidated with the property of the Masonville Company. At the same time the name of the company was changed to Grosvenor-Dale Company; Masonville receiving the name of Grosvenor-Dale, and Fisherville that of North Grosvenor-Dale. In the same year was commenced the erection of the new mill at North Grosvenor-Dale. It is four hundred and sixty-four feet long, seventy-three feet wide, and of four stories with an attic, the latter being well lighted and filled with machinery. There is an extension, measuring one hundred and twenty-eight by sixty-seven feet, of equal height with the main factory, and an ell, one hundred and fifty-seven feet by fifty feet, also separate buildings for steam engines, boiler, and gas works. There are 65,000 spindles. In architectural style, solidity of construction, convenience of arrangements, and adaptation to economical working in every part, it is a model group of mills, unsurpassed in this country. The business was organized as a corporation July 12, 1883, under a charter granted by the legislature of

Connecticut, with the name of Grosvenor-Dale Company.

William Grosvenor died August 17, 1888. For nearly forty years he gave personal attention to the financial interests of the concern, conducting them with consummate ability and success, the facilities for manufacture having been increased, under his wise and enterprising management, more than twelve fold. A gentleman of commanding personal presence, genial and courteous in manners, kindly and generous, liberal and hospitable, he strongly attracted to himself those with whom he had frequent, or casual, intercourse. He was deeply beloved in the domestic circle, esteemed and respected in the best society of the city, — his home for more than half a century — and honored among the merchants and manufacturers of New England, for his integrity, capacity and enterprise, and regarded as one of its ablest business men. For several years before his death, retaining a general supervision of the business, he committed its details and responsibility to his oldest son, who succeeded him as treasurer; and, since the death of his father, has been the executive head of the company, its stock being held by himself, his brother, and his sister. The record of the development from the little factory in the swamp, with its 1,600 spindles, to the present aggregation of mills, of over fifty fold capacity, has been one of exceptional success among the cotton industries of the country.

WORKS OF THE PROVIDENCE MACHINE COMPANY.

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If the life of Samuel Slater represents the successful establishment of cotton spinning in this country, that of Thomas J. Hill, the president and treasurer of the Providence Machine Company, stands prëminently the representative of the furtherance of that industry by the building of machinery for use in the cotton mills. Mr. Hill worked in the Old Slater Mill when a boy; he was a partner with Samuel Slater when a young man; as the result of that partnership he founded a business whose products are known wherever cotton or worsted machinery is used — a business which has grown, from a partnership where Mr. Hill had nothing but experience and indomitable industry to place against the capital of Samuel Slater, to an establishment which is to-day one of the largest of its kind in the country. Its success was assured from the beginning, and to-day Mr. Hill is not only the largest owner in the Machine Company, but is interested in other manufacturing establishments, giving to them much of his personal direction. Though he has passed his eighty-fifth birthday, he can be found at the works of the Machine Company nearly every morning before a large share of the present generation has arisen.

Mr. Hill was born in Pawtucket, March 4, 1805. His father was a blacksmith and moved to Pawtucket near the beginning of the present century, depending for his patronage, largely, upon the cotton factories which were being established. He did not accumulate much property and the young man was compelled to begin work at the very early age of 8 years, when he was a mill boy in the Old Slater Mill, remaining there but a few weeks. From that time he was variously employed in different factories, taking his first lessons in the working of iron from his father, until February 28, 1822, when he became an apprentice in the shop of Pitcher & Gay, which was at that time one of the largest machine shops in the country, devoted to the manufacture of cotton machinery. During his apprenticeship many improvements were made in the processes of cotton spinning; the power-loom was placed in successful operation and the geared speeder was manufactured by the firm by whom young Hill was employed. He continued with Pitcher & Gay eight years, taking some contracts on his own account, until

April, 1830, when he took charge of the machine shop of the Providence Steam Cotton Manufacturing Company, which was at that time owned by Mr. Slater and two of his sons. The business of cotton manufacture was increasing and demanded more room than in the existing buildings, and Mr. Hill foresaw the advisability of making a separate industry of the building of machinery, from which grew the organization of the Providence Machine Company — Samuel Slater and Thomas J. Hill being partners in the business. Mr. Slater furnished the money and was to have three-fifths of the profits, Mr. Hill contributing his experience and receiving the remaining two-fifths. This was the foundation of the extensive establishment operated by the Providence Machine Company.

The next year Mr. Slater died, and his interest in the Machine Company passed to other parties, largely those in control of the Steam Manufacturing Company, but the industry was carried on successfully and continued under Mr. Hill's management, his own interest being retained at the same time. In 1845, Mr. Hill bought the land where the works of the Providence Machine Company now stand, began the erection of a new building, and purchased, August 26, 1846, the interests of the mill people in the plant which had been started by himself and Mr. Slater. The business at the new shop was carried on by Mr. Hill in his own name until the completion of this purchase, when the machinery was removed to its present location, and Mr. Hill, who then became sole proprietor of the entire industry, assumed the old firm name of the Providence Machine Company. The plant gradually increased, new buildings were erected and improvements made, and in 1874, the business was organized as a joint stock company, with a capital of $350,000. The manufacture of specialties in cotton machinery has been largely carried on, notably that of the Davol speeder, and a fly-frame which was first made in England, and whose manufacture in this country had proved unsuccessful until Mr. Hill gave to it years of personal attention. Since that time it has entered into competition with the English fly-frame, and it has been found that the machines made at the works of the Providence Machine Company last longer, run lighter and need fewer repairs than those of the English make. The first frame of this kind made by Mr. Hill was for use by the Naumkeag Mill, in Salem, Mass. The main building of the company is 220x60, and parallel to this, connecting with it in the centre, is another 220 x 36. There is also a foundry, pattern shop, store houses, office and other buildings — covering an area of some two acres which are owned by the company and three more which are the private property of Mr. Hill. Thomas J. Hill is president and treasurer of the company.

Although the development of the business of the Providence Machine Company has been Mr. Hill's life work, he has been engaged in other enterprises at different periods in his life, and is thus connected at the present time. In 1837 he purchased a mill in Willimantic, repaired it and put in new machinery, which he sold in 1845 to A. D. & J. Y. Smith; in 1852 he became associated with Francis Skinner, Benj. E. Bates and others in the erection of the Bates Mills in Lewiston, Me., and started a foundry and machine shop there; these were later sold to other parties and have proved successful industries. In 1863, Mr. Hill purchased a large tract of land in Warwick, January 12, 1867, an application was made for the incorporation of the Rhode Island Malleable Iron Works, and a plant was established for the manufacture of malleable iron castings. Mr. Hill made additional purchases of land, built and bought houses for rent to the workmen, and from this has developed a beautiful village known as Hill's Grove. A depot was erected, half the expense of which was borne by Mr. Hill. He also has built a fine school-house, and other business men of Providence have put up residences in the vicinity. In 1875 Mr. Hill erected a large mill, fitting it with improved cotton machinery, at this place, and May 19, 1879, an incorporated company was formed, which started the Elizabeth Mill, so named after the wife of Mr. Hill. Fine cotton yarns are the principal production of this mill, and the company in 1886 purchased the mill in East Greenwich, formerly known as the Peckham Mill, and which had been re-stocked with machinery in 1854. The first and large mill at Hill's Grove is known as Elizabeth Mill No. 1, and contains 20,000 spindles — that at East Greenwich is known as Elizabeth Mill No. 2, and contains 7,800 spindles. Mr. Hill is president of this company and of the Malleable Iron Company. He was a member of the Common Council of Providence in the years 1848-52; 1855-56; and 1878. For more than thirty years he has been president of the Lime Rock National Bank, and a director in other institutions.

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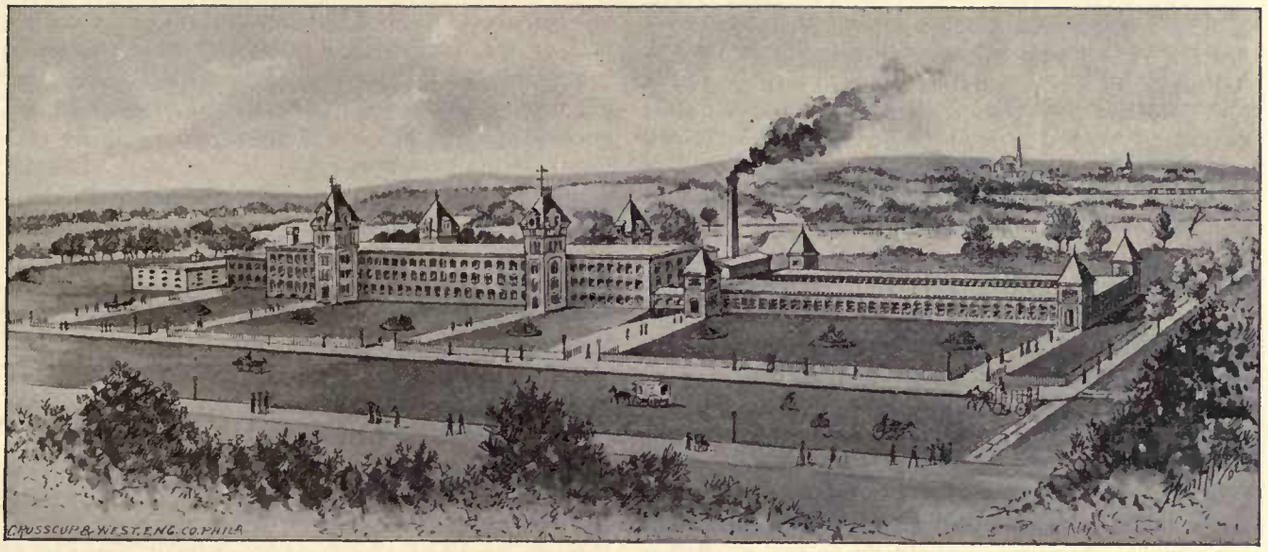
The cotton mills of the Social Manufacturing Company contribute very largely to the prosperity of Woonsocket, R. I. The history of their growth, from the time of the purchase of the Social and Harrison mills in 1854, to the present time, when the plant consists of three large mills, the Social, the Globe and the Nourse. is at the same time a history of the business success and enterprise of ex-Governor Henry Lippitt, the principal owner of the stock and treasurer of the company.

Henry Lippitt was born in Providence, October 9, 1818, and is a descendant of John Lippitt, who came to Rhode Island in 1638, and was the first of that name in this country. Christopher and Charles Lippitt, great-grandsons of John, were among the pioneer manufacturers of the state, and the two brothers, with others, organized the Lippitt Manufacturing Company in 1809. Charles' son Warren, the father of Henry Lippitt, was a sea captain, and afterwards a cotton merchant in Providence and Savannah, but on the decease of his father he was chosen treasurer of the Lippitt Manufacturing Company, holding the position until 1850, the time of his death. Governor Lippitt, on the completion of his studies in Kingston Academy, entered the employ of Barr & Smith, of Warren, and in November, 1835, he returned to Providence, where he was for three years book-keeper for Josiah Chapin & Company, the largest cotton firm in the city. In 1838, Mr. Lippitt associated himself with Edward Walcott in the commission business, the firm being Walcott & Lippitt, with Amory Chapin as special partner. On the retirement of Mr.

THE SOCIAL.



THE NOURSE.

THE GLOBE.

THE FACTORIES OF THE SOCIAL MANUFACTURING COMPANY, WOONSOCKET, R. I.

Walcott in 1840, Mr. Chapin became an active partner, and the firm of Amory Chapin & Company continued until 1846, doing an extensive traffic in bale cotton and print cloths, when Mr. Chapin died, and Robert L., a younger brother of Mr. Lippitt, became a partner. In 1848, the two brothers, with the assistance of their father and some Providence capitalists, purchased the Tiffany mill in Danielsonville, Conn., from Comfort Tiffany, the father of Charles L., the senior partner of Tiffany & Company, of New York. This was the beginning of Mr. Lippitt's manufacturing experience on his own account. The following year, a corporation was formed under the style of the Quinebaug Manufacturing Company. The original mill property included 300 acres of land and 3,000 spindles. Another mill of 10,000 spindles was erected, and in 1850, Governor Lippitt's father died. Amos D. and Moses B. Lockwood purchased an interest in the company, which was reorganized, and the mill was fitted up for the manufacture of delaines. In addition to this industry, the Lippitt brothers hired the Coddington Mill at Newport, where cotton goods were manufactured until 1853, when the mill was burned. The following year the brothers sold out their interest in the Quinebaug Manufacturing Company, and purchased an interest in the Social and Harrison mills in Woonsocket, entering into a manufacturing business which has continued up to the present time, and continues to furnish employment to a large number of people.

In 1858 Robert L. Lippitt died, and his interest was purchased by Governor Lippitt, who closed up his commission business and decided to devote his entire time to manufacturing. The building and machinery was increased to a capacity of 40,000 spindles, and in 1874 the mill was burned. A brick mill, with a capacity of 60,000 spindles, was built the same year. It has two large towers and a clock, and on the facade are the words "Burned 1874 — Erected 1874." October 25, 1876, the Globe mills, in an opposite part of Woonsocket, were purchased. This plant was built by George C. Ballou in 1864, who added to it in 1873 a new stone mill, in which he personally fed the first cotton in the moving lapper. On his decease the heirs made an assignment, and the property was sold at auction. The old mill contained 8,576 spindles and the new one 35,392, and the Social Manufacturing Company bought the entire property for $363,000. The company now had about 104,000 spindles, and the capital stock, which was originally $300,000, was increased January 1, 1870 to $600,000, and in 1874 to $1,000,000. In 1882, the Nourse Mill, which is situated a short distance opposite the Social, was begun and completed in October, 1883, making three large mills which are the property of the Social Manufacturing Company, the new mill being named after Charles Nourse, who had been resident agent for twenty-five years. About the same grade of goods is manufactured in the three mills — their product being twills, sateens, fancy and plain cotton goods. A coarser line of cottons is produced at the Social, and the Nourse makes the finest grade. The same superintendent has charge of the Social and Nourse mills, and the office is in a handsomely furnished building erected especially for this purpose. There is a separate office and superintendent for the Globe — its situation being a considerable distance away from the other two mills. The portions of Woonsocket covered by the Social and Globe mills constitute villages by themselves — and a large number of tenements are owned by the company. They are, however, inadequate for the accommodation of the operatives, some of whom are compelled to seek habitation outside. Within the past year a new machine shop has been erected at the Social mills, and the old shop utilized by the addition of 142 looms. The yarn used in the manufacture of the goods, in all the mills, is spun on the premises. The capacity of the Social Mill is 1,380 looms, 53,824 spindles; the Globe 933 looms, 41,040 spindles; the Nourse, 542 looms, 42,912 spindles. The difference in the proportionate number of spindles to a loom between the Nourse and the Social and Globe mills is owing to a difference in the machinery. Three hundred and fifty operatives are employed at the Nourse Mill, 450 at the Globe and 650 at the Social. Power for the Social and Globe mills is furnished by steam and water in combination; the Nourse is run entirely by steam, the power being furnished by a Corliss compound tandem engine, of 1,000 horse-power. The Social Mill has also a 1,000 horse-power engine. The products of the mills are sold largely in the brown; but for bleaching purposes, when desired, the Silver Spring Bleachery, of which Governor Lippitt is the principal owner, is utilized. The goods are sold directly to jobbers by the commission firm of H. Lippitt & Company, of Providence, which represents not only the Social Manufacturing Company, but the Lippitt Woolen Company, and other manufacturing establishments with which Mr. Lippitt is connected. The present officers of the Social Manufacturing Company are, C. H. Merriman, president; Henry Lippitt, treasurer.

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The Silver Spring Bleachery and Dyeing Company was incorporated in 1864, with a capital of $200,000. A controlling interest in the old Silver Spring bleachery, which is situated in Providence and which began operations in 1850, was purchased in 1862 by ex-Governor Henry Lippitt. Included in the purchase were eighty acres of land, one and five-eighths of which are within the walls of the buildings. The capital stock has since been increased to $400,000. Henry Lippitt is president of the corporation, and his son, Charles W. Lippitt, is treasurer, agent and manager. At this establishment is done all the bleaching for the Social Manufacturing Company, though a large share of the products of the mills of this company is sold in the brown. The name of this bleachery was given from the copious and pure springs in the vicinity, which are excellent for the purposes of the works, the water filtering through a stratum of finest sand twenty feet under ground, and there is an abundance of such water. In addition to the bleachery proper, printing machinery has been set up, and a genuine turkey red print has been produced, as well as other colors on the same basis, equal in every respect to the colors made at the famous works in England. The capacity of the works is fourteen thousand pieces per week, and some two hundred people are employed.

Spool cotton is an article of merchandise that enters very largely into the industries of the country. In common parlance it is known by the ordinary two hundred yard spool which every good housewife considers an indispensable part of the family work basket. Of late years, however, the introduction of the sewing machine has created a demand for the thread in longer lengths on a single spool, so that the production of spool cotton put up in this form has come to be very extensive, and enters materially into the stock of the retail dealers in the country. But the largest share of cotton made in the thread factories is for manufacturing purposes, and is used extensively in the production of goods for domestic use. It enters into the composition of every article of wearing apparel, and the trade to the hosiery and underwear manufacturers, in particular, is enormous.

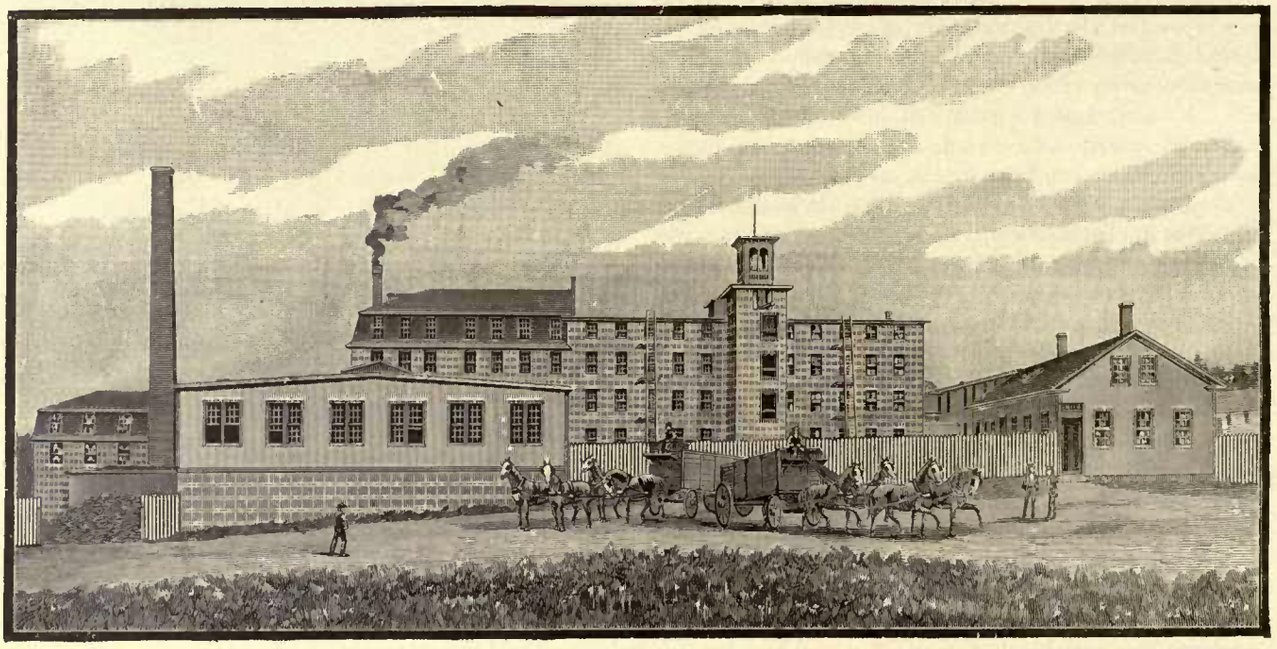
This industry gained an early foot-hold in Rhode Island, and in the immediate vicinity of Providence, and the works of the Barstow Thread Company, situated on Sabin Street, may justly be classed among the important manufactories of the city. This company has been doing a prosperous and growing business in the making of thread, both for domestic and manufacturing purposes, which has materially increased within the last five years. The original plant, formerly located in Pawtucket, was called the Pawtucket Thread Company, and this name was retained until a few years ago. In 1870, the manufactory was removed to Providence, and became incorporated in 1888, under the title of the Barstow Thread Company, taking the name from Mr. George E. Barstow, its present treasurer. The building which is occupied by the company is a large five story block, 160 x 60 feet, and here is manufactured the Barstow six-cord thread for domestic purposes, and spool cotton in lengths varying from 100 to 23,000 yards, for manufacturing. The demand from the latter source in long lengths has made this the largest part of the industry, and the thread of this company will compare favorably with any of the more extensively known and older manufacturers in this branch. Following the example of the English and Scotch makers, this company has purchased all the yarns for the manufacture of its thread, and does not, therefore, require so large a force of people as is employed by the manufacturers of thread in this country who have been accustomed to spin the yarn on their premises. The greater part of the production of this company at the present time is three-cord thread — sold very extensively in the New York market, through the commission house of Alexander King & Company. This thread for domestic purposes, put up on small spools, has been known for many years in the market as King's Cotton. It has always had a large sale, and has not materially diminished. The introduction of the sewing machine, and the use of six-cord soft finish cotton, have in some cases affected the manufacture and sale of the three-cord, but not so with the thread made by this company. Both grades, the six-cord Barstow, and the three-cord King's, are made at the factory, and the demand for the latter has never been greater than at the present time. About one hundred and fifty operatives are given employment at the works of the company.

Mr. Barstow, the treasurer, became connected with

GEORGE E. BARSTOW,
TREASURER OF THE BARSTOW THREAD COMPANY.

the establishment in 1881, and since that time has been thoroughly identified with the industry, increasing the capacity of the works and placing the productions of the company on a basis that has firmly established their reputation among the manufacturers. His experience, previous to his connection with the thread company, in the care of the private investments and large interests of his father, has proved invaluable in this connection. Mr. Barstow is the son of Honorable Amos C. and Emeline M. Barstow, and was born in Providence in 1849. After graduating from the public schools of that city, he entered Mowry & Goff's English and Classical High School, continuing there until a serious illness prevented the completion of the full course of instruction. He then entered the private office of his father, giving his attention to the care of the real estate and other investments with which the elder Mr. Barstow was largely identified. He became interested in the prosperity and business advancement of his native city, and was instrumental in establishing the Providence Warehouse Company, acting as its manager and treasurer for six years. This corporation does a very large business in storage, giving warehouse receipts for merchandise, and is of great advantage to the merchants. Mr. Barstow retired from its management when he became connected with the thread business, though he still retains an interest in the corporation. He has also for three years been treasurer of the Nashua Lock Company, of Nashua, N. H., the oldest establishment of its kind in this country, and is now treasurer of the Slater Mill and Power Company. Mr. Barstow has been prominently identified with the work of education

in the public schools of Providence for twelve years, has been a member of the School Board, and at the present time, 1890, is its president. He was chosen a member of the city council for 1890, and was re-elected for the year 1891. His office, that of the Barstow Thread Company, and the Slater Mill and Power Company, is at 37 Weybosset Street. The present officers are Alexander King, of New York, president, and George E. Barstow, treasurer.



WILLIAM TINKHAM & COMPANY'S HARRISVILLE MILL.

Mr. William Tinkham, who is at the present time a resident of Providence, and president of the Providence & Springfield Railroad Company, is a citizen who has attained his present position of honor and responsibility by the utmost diligence, and whose manufacturing industry in the village of Harrisville is a source of great prosperity to that place. The business which is now conducted there under the style of William Tinkham & Company has been very successful, and this is due largely to the administrative ability of the head of the firm, whose life work has been an example of what untiring energy and perseverance can accomplish from the humblest beginnings.

Mr. Tinkham was born in Harmony Village, Glocester, R. I., July 8, 1823. He is a lineal descendant of Hezekiah Tinkham, who came from England during the Revolutionary War, and settled in the south-eastern part of Glocester, as a blacksmith, and who died in 1812 at the age of 100 years. This trade was followed by his descendants, and the subject of this sketch, the son of Nehemiah and Alzada (Andrews) Tinkham, remained at home during his minority, working in the shop of his father and learning the blacksmith's trade. His education was obtained in the district school and in Smithville Seminary, now the Lapham Institute, in North Scituate, R. I. In 1844, being in poor health, he relinquished the forge, and entered a store in Greenville, first as clerk and later purchasing the business. This he carried on until 1853, a part of the time having a partner, when he became clerk in the store of a manufacturing company for a short time. In this same year, 1853, in company with Job S. Steere, he hired a woolen mill in Mapleville of Daniel S. Whipple, and with a single set of machinery began the manufacture of tweeds and jeans. In the fall another set was added, and the firm made satinets till 1856. Mr. Tinkham resolved to devote himself to manufacturing, and realized that a practical knowledge of the industry, in all its departments, in which he was deficient, was necessary to complete success, and he set about obtaining that knowledge. He began in the lowest room as an operative, taking the place of his assistant in scouring wool. He then learned the process of dyeing, dismissed the boss and engaged an assistant, and thus he went from room to room, working over time, until in three years he was complete master of the business in all its details.

In 1856 the firm of Steere & Tinkham purchased the Harrisville Mill from Jason Emerson for $30,000, paying $4,000 down and giving a mortgage for the balance. The machinery was removed thither from Mapleville, two more sets were purchased, and the firm then began for the first time the manufacture of satinets on its own premises. The following year an addition of 100 feet in length was made for dyeing and other purposes, entailing a further expense of $20,000. The financial crisis of 1857 followed, and the firm found the outlook discouraging. Heavily in debt from the late improvements, and there being little hope of business, it was not, surely, a bright prospect. But here the courage of Mr. Tinkham asserted itself. He went out and made business, manufacturing on shares a part of the time, and buying and selling in person. He also adopted the cash system, which he followed ever afterwards. The

firm carried on a profitable business when other mills were idle, and in 1860 the balance of the money due on the first purchase was paid. Four more sets of machinery were then added, and the manufacture of cassimeres was begun, and in January, 1865, the firm paid every cent of its indebtedness and had a surplus on hand.

In 1868, Mr. Tinkham became a resident of Providence, and in company with his brother Ellison and Franklin Metcalf, operated the Carolina Mills in the town of Richmond. This continued until 1876, when Mr. Tinkham sold his interest to the remaining partners. The firm of Steere & Tinkham continued until 1873, when Mr. Tinkham purchased Mr. Steere's interest, and formed a partnership with Mr. F. S. Farwell, an experienced manufacturer, who had for many years been superintendent of the Granite Mills in Pascoag. The style of the firm became Tinkham & Farwell. In 1878, Mr. Tinkham's son, Ernest W., was admitted to the firm, and the property had then become very valuable—the mills having a capacity for weaving and finishing equal to eighteen sets. In 1881 the machinery was changed, and the firm entered upon the manufacture of fancy worsteds, and the brands of "Newmarket" and "Empire" have achieved a high reputation. In 1884 Mr. Farwell retired from the firm, which has since been known as William Tinkham & Company. The mill, at present, is of stone, 40 x 165 feet, with two wings —that on one side measuring 60 x 106, and on the other 22 x 105,—the entire area covered by the buildings being about one-third of an acre. The mill is fitted with the most modern machinery and appliances, and gives employment to nearly four hundred persons.

Mr. Tinkham was elected a representative to the Rhode Island Assembly in 1866, but is known outside of his manufacturing business chiefly for his interest in the Providence and Springfield Railroad of which he was one of the first projectors, and of which he has been president since its organization. The preliminary surveys for the road were made in 1871 and it was built and opened for travel in 1873, trains beginning to run August 11. The main line is little less than twenty-three miles long, branching from the New York and New England Railroad at Olneyville, and extending to the village of Pascoag. The original intent of the projectors of the enterprise was to extend this road to Springfield, Mass., thus giving the people of Providence a direct line to the west, and in 1881 the General Assembly incorporated the Providence, Webster & Springfield Railroad Company. The time for the extension of the road has expired by limitation, several unfavorable circumstances conspiring to prevent its construction. Recently the road has been leased to the New York & New England Railroad Company, for ninety-nine years.

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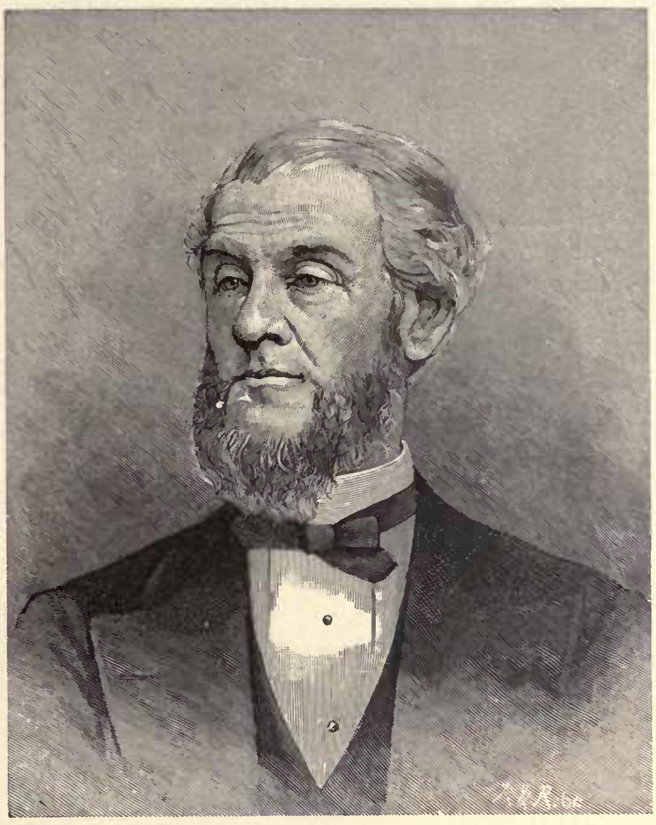
The American Multiple Fabric Company, on Hartford Street, in Olneyville, controls an industry peculiar to itself, and carries on the manufacture of textile hose, for hydraulic and fire uses, by a process of weaving of which the company has exclusive control. The company was formerly known as the S. W. Baker Manufac-



WILLIAM TINKHAM,

MANUFACTURER, AND PRESIDENT OF PROVIDENCE AND SPRINGFIELD RAILROAD.

turing Company, Mr. Baker being the inventor of the process by which the goods are made; but in 1884 the present name was assumed. The fabric of which the hose is made possesses great strength and durability, while at the same time it is exceedingly pliable and can be woven in any thickness desired. A continuous rubber lining is inserted in the hose by the Gutta Percha and Rubber Manufacturing Company of New York, which controls the market on this hose, rendering it impervious to water, and the goods have an excellent reputation. Patent evaporating horse blankets, another invention of Mr. Baker, are manufactured by this company, as well as endless aprons for worsted yarn manufacturers and sundry supplies for paper makers and calico printers. Charles Fletcher is president of the corporation, and William A. Wilkinson its superintendent and agent.

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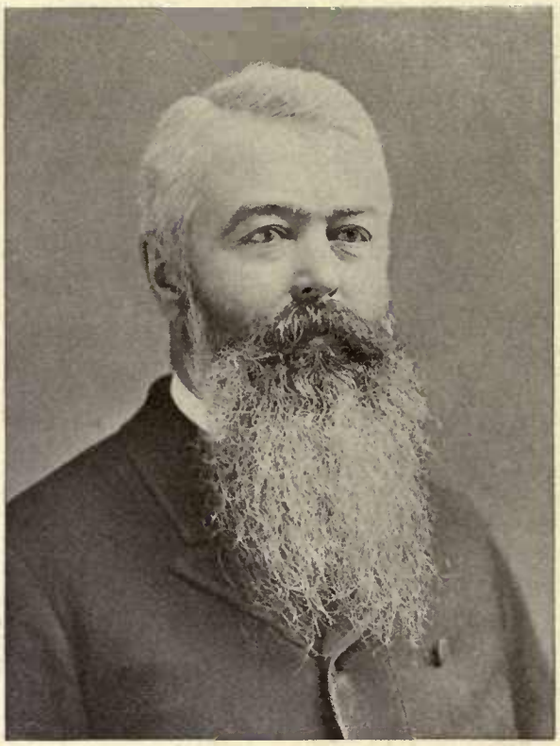
The extensive works of William A. Harris, builder of the Harris-Corliss Engine, covering 148,120 square feet of land on the corner of Park and Promenade streets, were first started in their present location November 17, 1868. William Andrew Harris, the founder of the business, was born in Woodstock, Conn., March 2, 1835, and is the eighth generation from William Harris who came to this country in the ship "*Lion*" with Roger Williams. In 1855, after being employed three years in the Union Bank of Providence, he was engaged as draughtsman by the Providence Forge and Nut Company, and after the consolidation of this company with



WILLIAM A. HARRIS,

BUILDER OF THE HARRIS-CORLISS STEAM ENGINE.

the Rhode Island Tool Company, the following year, he entered the employ, in the same capacity, of the Corliss Steam Engine Company. He remained here until August 1, 1864, when he began business on his own account on Eddy Street, in the building used as headquarters in the Dorr times. The business rapidly increased, and he removed to his present location in 1868, as stated. The group of buildings was erected specially for the business which is carried on therein; and the machinery and tools were also specially constructed. Here are built stationary engines, ranging from ten to two thousand horse-power, and the Harris-Corliss engines are used in many of the largest manufactories of this country. The works are capable of turning out a half million dollars worth of merchandise annually, and the industry has contributed very largely to the prosperity of Providence. A large proportion of the mechanics employed in this factory have learned the trade in the shops of the establishment. Under the apprenticeship system which obtains here these shops are a manual and industrial school of the most approved kind. This apprenticeship covers a period of three years, the first six months of which are probationary, at the end of which time the learner is master of one of the best trades in the world. The system has proved very satisfactory, not only for Mr. Harris, but for the young men who have thus entered his employ.

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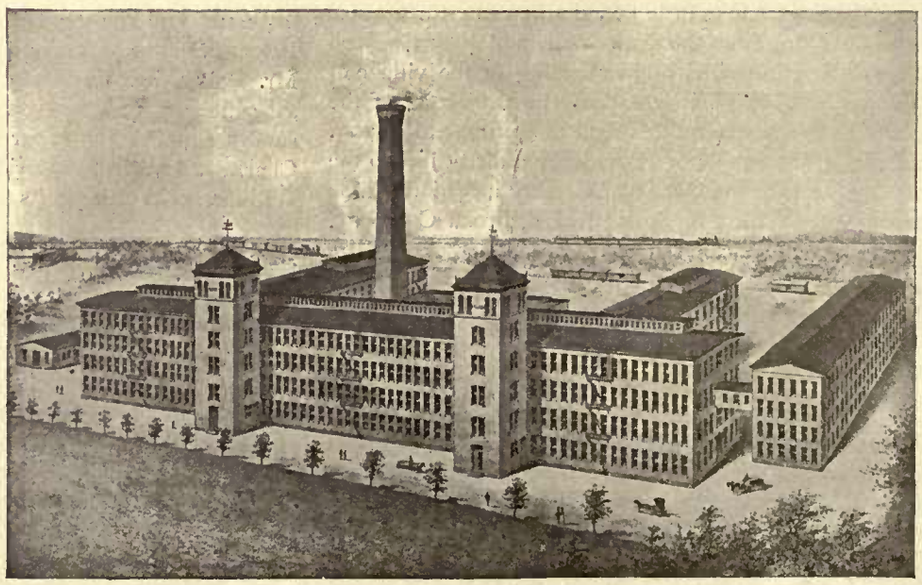
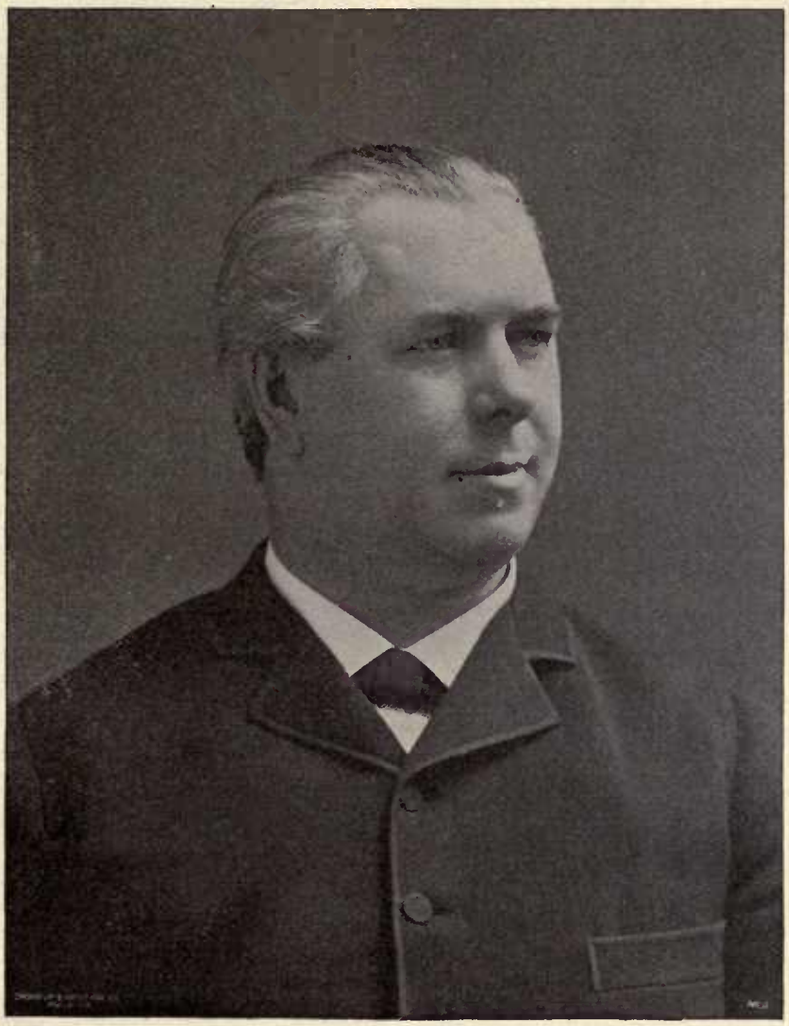
The manufacture of rubber boots and shoes, in all the different styles and varieties, is a very important industry in this country, and the works of the Woonsocket Rubber Company, in Woonsocket and Millville, the latter place but a few miles distant from Woonsocket, have materially contributed to the growth of both places. The plant was a small one at the outset; it has been devoted entirely to the manufacture of boots and shoes since it has been managed by an incorporated company, and the output of the two factories, at the present time, is known throughout the world.

A copartnership was formed November 25, 1864, for the manufacture of rubber goods, by Lyman A. and Simeon S. Cook and Joseph Banigan, and the industry was started in an old planing mill in Woonsocket. At first the business was confined to the manufacture of wringing-machine rolls and small wares. An incorporated company was formed in 1867, with a capital of $100,000, and rubber boots and shoes were first made in October, 1868, since which time this has been the sole product of the mills. Lyman A. Cook was the first president of the company; but Mr. Banigan was the practical rubber worker. All the machinery from the start was set under his direction; and in the early days he superintended the works and sold all the goods. He soon became president of the company, and it is his enterprise and careful management that has built up the business, and increased the product to the enormous amount which it has attained at the present time. The works at Woonsocket were enlarged from time to time, till the necessities of the manufacture demanded the erection of a large plant at Millville, the land on which the factory stands



THE ALICE MILL—WOONSOCKET RUBBER COMPANY.

being at that time owned by Mr. Banigan. Previous to the erection of the new mill, both boots and shoes were made at Woonsocket. The factory at Millville was built in 1882, and from that time the manufacture of boots has been confined to this mill, while that of shoes has been carried on at Woonsocket. In the growth of the business, the capital of the company has been increased at various times, until it is now $1,200,000, and permission has been granted by the General Assembly for an increase to $2,000,000. In April, 1889, the erection of a new mill at Woonsocket was begun, which is now completed, and where all the shoes are manufactured. It is larger than the factory at Millville, and is called the Alice Mill, after Mr. Banigan's mother. The output in dollars and cents is about the same in each mill, and within the past two decades there has been a growth in the production, by the company, from less than $300,000 to $6,000,000.



JOSEPH BANIGAN,

PRESIDENT OF THE WOONSOCKET RUBBER COMPANY

The plan of the two mills is similar; each contains a main building, four stories high, with two wings, a boiler wing, a store house, box factory and offices with a cement and varnish house in the rear. At Millville the main building is 348 x 64; with two wings 113 x 60, a boiler wing 133 x 50, and a store house 133 x 60. In the Alice Mill, the main building is 420 x 67; with two wings 138 x 59, and a boiler wing 136 x 50. On one side there is a store house 203 x 60, and on the other a packing-box factory 154 x 40. The Alice Mill is larger in every respect than that at Millville, and was designed by P. J. Conley, the manager of the Millville branch of the industry. Every arrangement possible for fire protection exists in both mills. There are stand pipes extending above the roof, there are lines of hose and automatic sprinklers on every floor, there is a special fire company composed of the employes in each mill, and a dozen or more hydrants are placed around the grounds. Two grades of boots are made at Millville; two grades of shoes at Woonsocket. The first grade is called Woonsocket, the second Rhode Island. The capacity of the Millville factory is 8,000 pairs boots per day; that of the Alice Mill, 30,000 pairs shoes per day. Fifteen hundred operatives find employment at Millville; 2,000 at Woonsocket. Lyman A. Cook was the first president, shortly succeeded by Joseph Banigan, who holds that office at the present time. The first treasurer was John Boyden; the second F. M. Perkins. On the death of Mr. Perkins, a few years since, Frederick Cook was chosen, who is the present treasurer. Henry L. Ballou was secretary from the beginning until 1888, when he died, and was succeeded by W. S. Ballou, the present secretary. Mr. Ballou has been connected with the company twenty-two years, and he has been general selling agent for the past four years, which position he holds to-day in addition to the office of secretary. Since 1887 the company has had an office in Providence, which is now the headquarters of the company. Wholesale stores are conducted under the management of Mr. Ballou, in Boston, New York, Baltimore and Chicago.

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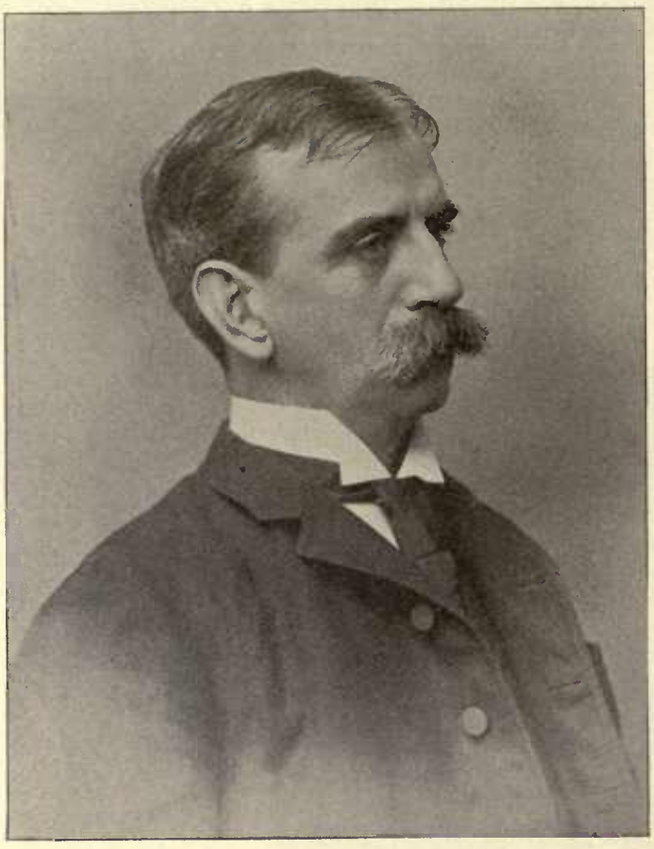
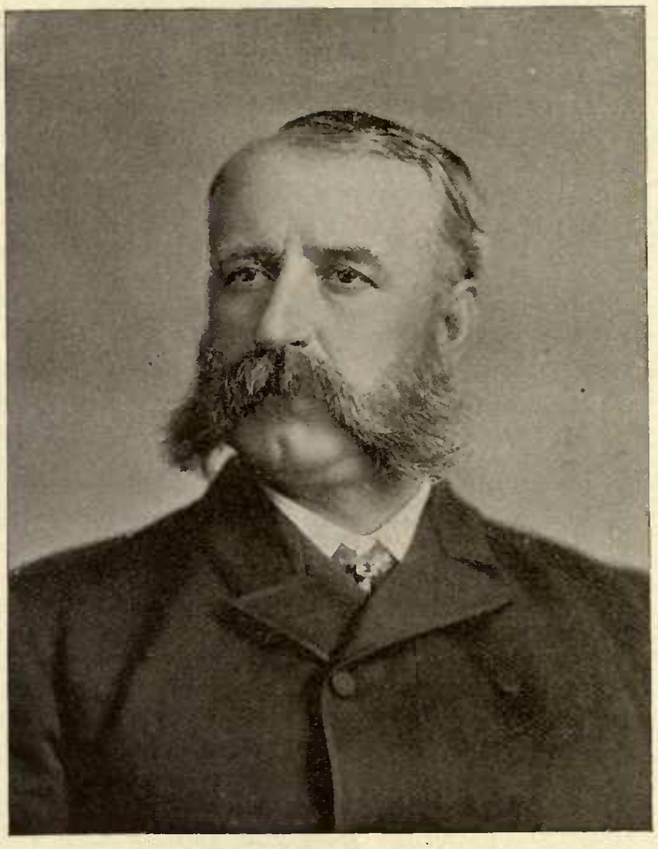
The extensive plant of the Providence Worsted Mills and the National Worsted Mills, on Valley Street, in Olneyville, has developed from the small nucleus of a single building to an establishment of nearly a dozen buildings, covering more than twelve acres of ground. Both have their origin from the enterprise of one man, and one is the natural outgrowth of the other, though they are two companies, incorporated at different times and separate from each other. In 1875, Charles Fletcher began the manufacture of worsted goods in an old stone mill, and from this has grown the industry which pro-



EX-GOV. HERBERT W. LADD,

OF THE H. W. LADD COMPANY.



CHARLES FLETCHER,

PRESIDENT AND TREASURER OF THE PROVIDENCE AND NATIONAL WORSTED MILLS.

duces such a large amount of goods and gives employment to so many operatives. Mr. Fletcher, from an early age, had been employed in the worsted yarn business in England, obtaining a thoroughly scientific and practical knowledge of the manufacture of yarns, and the demand for his goods was instantaneous. He found it necessary to increase his facilities within a year, and from that time enlargement has followed enlargement, until the combined plant consists of six large mills besides two store houses, a dye house, machine shop and several smaller buildings, including a handsomely fitted office. The products of the Providence Worsted Mills are worsted, mohair and genappe yarns finished to take the place of silk, and made in white, mixed and fancy colors. These are put up on bobbins, dresser spools, or skeins for the use of the trade, and are used in large quantities by the National Worsted Mills, which manufacture fine worsted suitings and overcoatings, equal to the best imported goods. The six large mills are numbered for convenience of management, the machinery is the best that can be obtained in this country or England, and each mill is independent of the other, as far as power is concerned. The entire process of manufacturing finished fabrics from the raw wool is carried on in these factories, making it complete in every part; and when it is considered that all this growth has been accomplished within fifteen years, it is in striking contrast to the ordinary development of the great industrial establishments of the country. Electric lights are used; steam-power is furnished by eight large Corliss engines, aggregating 2,600 horse-power, and over two thousand operatives are given employment. Charles Fletcher is president and treasurer of both the Providence and National Worsted Mills. The former was incorporated in 1883—the latter in 1886.

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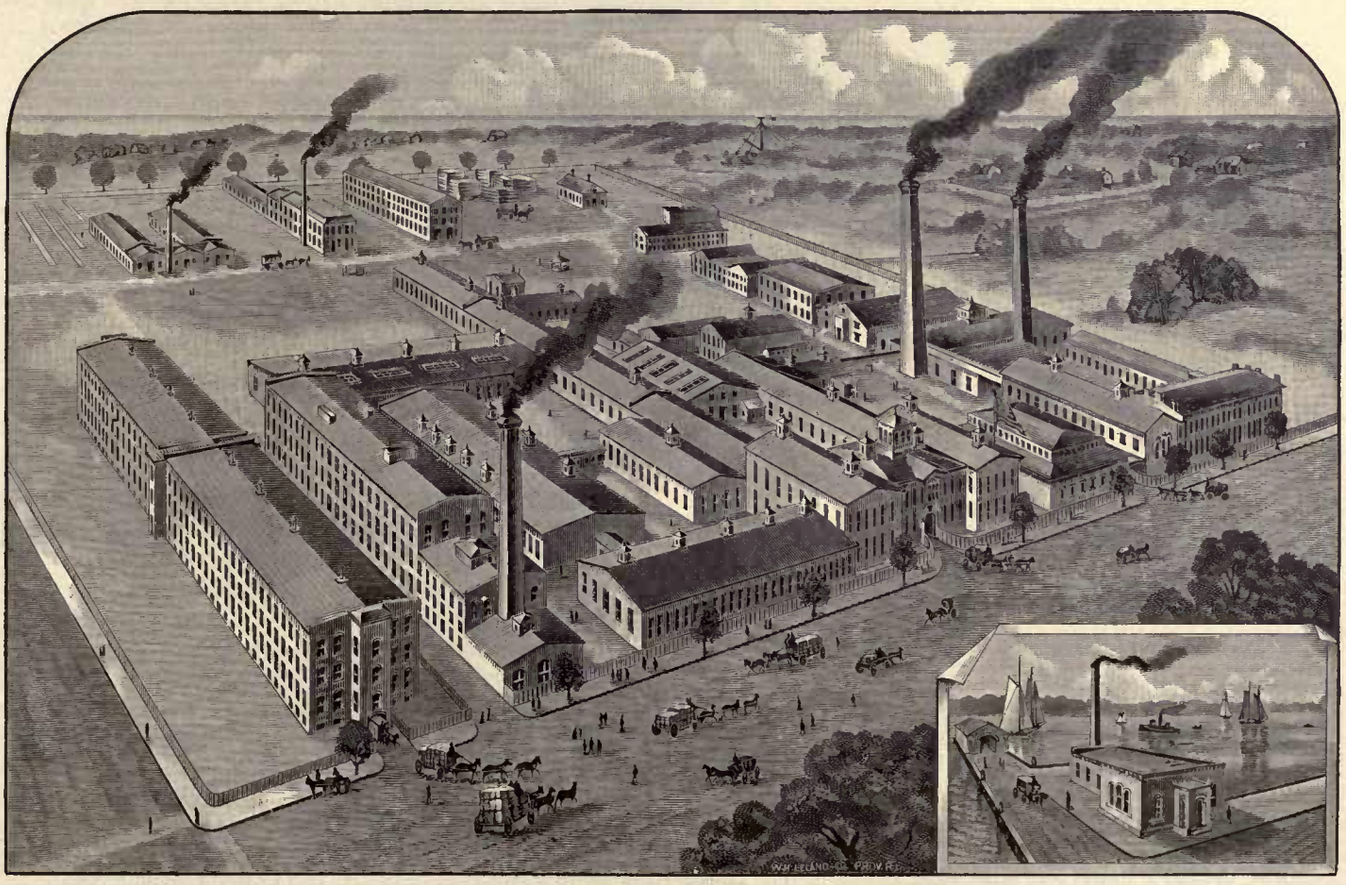
Herbert Warren Ladd, who was governor of Rhode Island in 1889-90, has been well-known to the business community of Providence for a number of years as a successful dry-goods merchant. He is a native of New Bedford where he received his education. Having learned the dry-goods business in his native city and in the importing house of White, Brown & Company in Boston, he established a store in Providence in 1871, and quickly made it a success. He very soon after coming to Providence distinguished himself by his public spirit, evincing an interest in numerous lines of effort, having for their object the development of the city in various ways. Governor Ladd's administration of his office was characterized by the same qualities as had been manifested in his business career, although the position has so little real power that he was unable to accomplish much. Yet his recommendations were excellent, and probably will bear fruit in the future. He was appointed by the legislature one of the commissioners to consider plans and recommend a site for a new State House, the erection of which he had urged in his inaugural message. He has also presented to Brown University an astronomical observatory, beautifully located on the east side of the city.

The plant of the National India Rubber Company, at Bristol, was started some twenty-seven years ago, by the National Rubber Company, to the business of which the present corporation is the successor. The original plant was small; but enlargement followed enlargement and a business of large magnitude was done by the original company, as many as 1,500 operatives being employed at one time, and the annual product reaching $3,000,000. The National India Rubber Company, incorporated under the laws of Rhode Island, was organized April 17, 1888, and succeeded to the plant and business of the National Rubber Company. This latter company succeeded the old Providence Rubber Company, and may with truth be said to have been the pioneer in the art of rubber manufacture. More improvements in the rubber art were made by this company than any other, for some of which, as the "fusion-lined" boot and shoe, the "Snow Excluder," "Monitor" and "Protected Heel" overshoes, patents were taken out.

The new company continued in the same line of manufacture, enlarging the departments and improving the quality of the product. It was the aim of the new management to produce, throughout the entire plant, the best goods that could be manufactured from pure Para rubber, and this standard has been strictly maintained. The making of boots and shoes, by the National India Rubber Co., in all the varied styles needed for the market, is a a very important branch of the industry. These are made in three grades — the first quality, called the "National," being stamped with the brand and the name of the company, and maintained at the highest standard that it is possible to attain. The other two qualities," Empire" and "Imperial," are also made with care, and are considered equal to any "grade" goods manufactured in this country. The growth and popularity of the game of tennis have created a demand for what is known as a "tennis" shoe, made with a rubber sole and canvas top —a demand which was instantly met by the National India Rubber Company. A handsome, stylish shoe was manufactured, in which nothing but the standard United States army duck was used, with the result that a very large quantity was sold during the year 1890. The demand for the tennis shoe made by this company was increased by this same determination on the part of the management to produce a superior article, and the shoe readily obtained the lead in the market.

While the manufacture of boots and shoes is the entire industry with many companies, and is with this company an important part of the business, the National India Rubber Company covers the entire field in the variety of its rubber product. Rubber clothing was made by the old company, but this branch was largely increased by the present management, and is confined to the manufacture of men's clothing — the Mackintosh coats made being admirable in quality and elegant in patterns, and in every respect the equal of anything to be found in the market. There are also made full lines of rubber belting, packing and hose — the latter from the three-quarter inch hose



THE NATIONAL INDIA RUBBER COMPANY'S WORKS, BRISTOL, R. I.

for gardens, to the larger hose, for fire purposes, breweries and manufacturing uses. The infinite variety of goods known to the trade as druggists' sundries, sold by the retail stores and used for hospital purposes, is manufactured by the company, also rubber door mats, foot balls and miscellaneous goods generally, and only the best grade of goods is produced at the works. There has also been recently added the manufacture of insulated wire for electrical purposes.

The plant at Bristol, which consists of twenty-seven buildings, covers an area of eighteen acres, and is the largest and best equipped plant in the country for the manufacture of rubber goods. Twenty-four thousand pairs of boots and shoes alone have been turned out at the works each working day, in addition to the large product in other goods. There are two pumping stations connected with the works—one utilizing the spring water for washing the rubber, the other pumping the salt water which is used in the condensers. The Bristol town water service is used in the boilers, of which there are seventeen at the works. There are three large engines, the largest being a Harris-Corliss condensing engine of 1,000 horse-power, the others of 200 horse-power each. The directors of the company are Frederick M. Shepard and Charles Loewenthal, New York, John McAuslan and Joshua Wilbour, Providence, and Samuel P. Colt, Bristol. The officers of the company are Samuel P. Colt, president and treasurer; John C. Balderston, vice-president; Charles A. Emerson, secretary. Isaac F. Williams is superintendent of the works at Bristol. The company is capitalized at $500,000, and has a surplus of $483,068, in addition to its capital.

WM. T. NICHOLSON,

PRESIDENT OF THE NICHOLSON FILE COMPANY.

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The plant of the Nicholson File Company, without doubt the most extensive of its kind in this country, is the result of the patient, persistent and thoughtful efforts of Mr. William T. Nicholson to accomplish by the use of machinery what previously had been done by hand process in England. It had been supposed by the foreign makers that no machinery could be invented in this country that would supplant their work in the manufacture of files. But Mr. Nicholson, since he began the process of making these articles, has secured no less than twenty-eight patents, and from the works of the Nicholson File Company are now produced over fifteen hundred dozen files and rasps of different kinds per day, and the importation of these goods, owing to the low price at which they can be sold in this country, has very sensibly diminished. The Nicholson File Company was incorporated in 1864. Mr. Nicholson was born in Pawtucket, and after being employed in many places where his mechanical genius was instantly recognized, he associated with himself, in 1858, Mr. Isaac Brownell, and under the style of Nicholson & Brownell began the manufacture of jewelers' tools and light machinery in Providence. He manufactured many tools and much machinery used by the government after the outbreak of the Civil War. His assistance was sought in the production of certain parts of the Springfield rifle, and during the war, after he had obtained certain patents, he devoted himself to the development of machinery for the manufacture of what has since been known as the increment cut file. There was little machinery available, and it had to be invented and perfected. The production of this company is distributed all over the world, and the plant has been enlarged during the past year by the purchase of the works of the New American File Company, in Pawtucket, and the files used by jewelers and watch-makers are being manufactured more extensively than at any previous time.

* * *

The Corliss Steam Engine Company, of which the late George H. Corliss was president and treasurer, is one of the important industries of Providence, its works covering an area of nearly five acres. The Corliss engine has a wide reputation, and is known wherever steam-power is applied to machinery. Mr. Corliss came to Providence in 1845, and very shortly turned his attention to the improvement of the mechanism of the steam engine. In order to produce engines combining his many inventions the extensive works now occupied by the company were erected. It was a Corliss engine that supplied the motive power at the Philadelphia Centennial Exposition, and in addition to the Rumford medal, awarded by the Academy of Arts and Sciences in Boston, in 1870, Mr. Corliss received the highest prize at the Paris Exhibition, in 1867, and at the Vienna Exposition of 1873 he received the grand diploma of honor.

The plant of the Cutler Manufacturing Company, in Warren, is the outgrowth of a cordage factory which was established in a small way in 1859 by C. R. Cutler and James Childs. The business was carried on in a building, 30 x 60, on the site of the present mills. This was raised up, enlarged, and built around at various times, so that the original building can scarcely be recognized save by those who are familiar with the changes that have been brought about. In 1860, Mr. George Hail, of American Screw Company fame, became associated with Mr. Cutler, and the manufacture of cordage was extended to that of twine, carpet warp, and finally hosiery yarn. This latter product was made only in a limited quantity until 1869, when an incorporated company was formed, and a new, three-story, brick building was erected, with a capacity of 9,000 spindles, and the manufacture of yarn was carried on to an increased extent. This mill was designated as Mill No. 2, the old factory, with its enlargements and improvements, being called Mill No. 1. Mr. Hail died in December, 1873, the interest of his heirs remaining in the business, which increased so as to demand still further facilities, and in 1880, another brick mill, 80 x 250, called Mill No. 3, was built, and was devoted exclusively to the producing of hosiery yarns. In 1889 Mr. Cutler died, and the interest of the heirs of Messrs. Hail and Cutler has continued to the present in the conduct of the industry.

Mr. Cutler, the originator of the enterprise, and for whom the incorporated company was named, was born in Ballston, Saratoga County, New York, December 20, 1822. In his early years he went to Chicago, and after a course in the High School of the then new western city, became a sailor on the lakes; but in 1839 came to Rhode Island and entered the merchant service, sailing from Bristol, whence he was shortly attracted to Warren,

HON. CHARLES R. CUTLER,

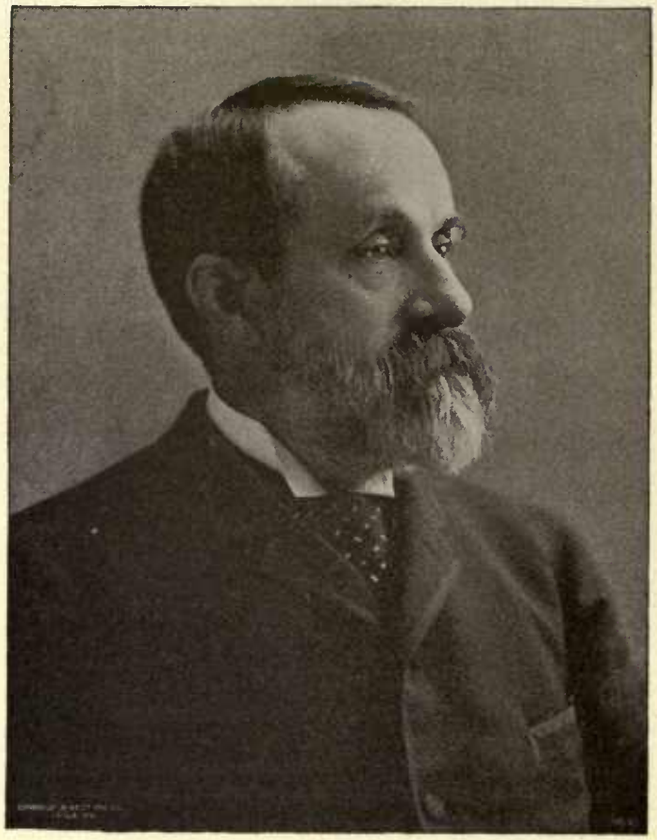
FOUNDER OF THE CUTLER MANUFACTURING COMPANY.

GEORGE HAIL,

FORMERLY OF THE CUTLER MANUFACTURING COMPANY.

by the whaling industry. In this he was successful to a remarkable degree, and at an early age was master of a vessel. He had sailed in all the waters of the globe, and twice around the world. He abandoned a sea-faring life in 1858, and the following year established the business of the Cutler Manufacturing Company. Mr. Cutler was held in high esteem by his fellow citizens, and received many honors at their hands. He was a member of the town council of Warren many years, chief of the fire department twelve years, and lieutenant-governor of Rhode Island for 1872-73. As grand master of the Grand Lodge of Masons in Rhode Island, he had the honor to dedicate, in behalf of the lodge, the monument which was erected to the memory of Roger Williams.

Yarns for hosiery, and twisted yarn, are the principal product of the plant, which gives employment to 275 operatives. Shortly after Mill No. 2 was erected, the company began the manufacture of knitting cotton, which is still made in all numbers from six to thirty, in white and colors. The plant has a capacity, at the present time, of 30,000 spindles, and uses 5,000 bales of cotton yearly. The power is furnished by two steam engines, one 250 and the other 175 horse-power. The officers of the company are Richard A. Lewis, of Philadelphia, president; Frank Hail Brown, treasurer and agent; Luther Cole, secretary. The company is capitalized at $300,000. Mr. Lewis, the president, is a son-in-law of Mr. Hail, one of the original stockholders in the corporation, was born in Pawtucket, and is a descendant of the Anthonys, who were pioneers in the cotton industry in that city. The wife of Mr. Hail donated funds for the establishment, in Warren, of a public library for the benefit of the citizens of the town, and a handsome edifice was erected on the principal street, as the result of her liberality, and that of others, called the Hail Free Library.



HENRY C. CRANSTON, ESQ.,
BANKER.

Henry C. Cranston, who conducts a successful banking and brokerage business on Weybosset Street in Providence, belongs to one of the oldest families in Rhode Island, two of his ancestors having been governors of the state in Colonial times. John Cranston, whose father was chaplain to King Charles the First of England, was a man of great ability, the first person in the colony to hold the title of major-general, and was governor of the colony from November, 1678 to March 12, 1680, when he died. His son, Samuel Cranston, was governor for twenty-nine consecutive years—from 1698 to 1727—and like his father, died in office. Henry C. Cranston was born in Providence, August 27, 1832, where he was educated in the public schools, graduating from the high school at the age of 14 years. He entered the law office of Charles F. Tillinghast and Charles S. Bradley for a few years, after which he learned the art of telegraphy. In 1848 the Rhode Island Magnetic Telegraph Company completed the construction of a line from Providence to Worcester, to connect with a line which had been previously built between New York and Boston. John W. Lane was the constructor, and the first operator, and after an office had been established in the Worcester passenger station, Mr. Cranston became the first pupil of Mr. Lane, and upon the extension of the line to Pawtucket, Taunton, Fall River and New Bedford, he was sent to Fall River to assume charge of the local office, where the receipts were hardly sufficient to pay the young man's board. After this experience he entered the office of the Providence *Journal* for a year, and in 1851, under John R. Bartlett of Providence, who had been appointed commissioner on the Mexican Boundary, Mr. Cranston was attached to this commission, as assistant in the engineering and surveying department, and clerk to the commissioner. On his return he entered the office of the Atlantic Fire and Marine Insurance Company, and in 1853 he entered the National State Bank, now the Old National Bank, being elected assistant cashier May 12, 1854, and July 3, 1854, he was promoted to the responsible position of cashier of the bank. At that time Mr. Cranston was the youngest cashier in the State. He remained in this position until October 1, 1864, when he engaged in the private banking and brokerage business, first as Butts & Cranston, afterwards as Greene & Cranston, and in 1878, on his account and in his own name, which business has continued to the present time. In addition to his banking and brokerage business, Mr. Cranston is connected with and interested in many institutions and corporations. He is president of the American Ship Windlass Company, vice-president of the Providence Telephone Company and the City Savings Bank, treasurer of the Providence Arcade Company, clerk of the Rawson Fountain Society, incorporated in 1772, besides a director in the Equitable Insurance Company, the Rhode Island Safe Deposit Company, the Rhode Island and Massachusetts R. R. Company, the Quinebaug Company, of Danielsonville, Conn., the Armington & Sims Engine Company, the Old National Bank and other institutions.

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The Friends' School, an institution for both sexes, is upon an eminence in the city of Providence, 182 feet above tide water. Most of the State of Rhode Island, and a large district of Massachusetts, are in view from its cupola, while the beautiful shores of Narragansett Bay complete the picture. Moses Brown, of Providence, founded it in 1784. An endowment of $100,000 came to the school in 1822, from Obadiah Brown, son of Moses, which money was produced at the Slater Mill, and was the largest bequest to any school in the country at that date. The Yearly Meeting of Friends for New England has the care of it. A thorough, practical education for business life and the most approved preparation for college are furnished. Many universities and colleges receive students from it on certificates, without examination.

The school has a large number of experienced teachers, and as far as practicable, they are specialists, limited to their several departments. The fine arts receive special attention. Excellent instruction is given in music. Wood-carving has recently been added. It has an astronomical observatory, valuable apparatus for chemical and physical work, and a rich mineral cabinet. The library contains about six thousand well selected volumes. A very home-like and agreeable appearance has recently been given to the rooms by the use of large numbers of beautiful pictures and busts. It is lighted with the Edison incandescent electric lights.

The educational force of an institution of this character is not limited to school hours; it is constant. The great benefits of co-education are everywhere discernible. For particulars address Friends' School, Providence, R. I.

FRIENDS' NEW ENGLAND BOARDING SCHOOL.

No financial concern in Providence has a better reputation or conducts a more extensive business in its own line than the private banking house of Wilbour, Jackson & Company. The firm receives money on deposit subject to check, discounts commercial paper, and its checks pass through the clearing house on the same footing as those of ordinary banks. The bulk of its transactions are, however, in general banking and foreign exchange, relating chiefly to the placing, investment, and transmission of funds. In this connection especial attention is given to dealing in first-class municipal and railroad bonds, and to government and other assuredly safe securities. For foreign exchange the house has unexcelled facilities, as it is sub-agent for the Cheque Bank, (Ltd.) of London, Eng., whose drafts can be cashed in any part of the world. Letters of credit are also furnished that are as widely negotiable.

The rooms of the firm are centrally located on the first floor of the building 48 to 52 Weybosset Street, and these quarters have been continuously used as a banking house since they were first occupied by Jackson & Butts in 1856. B. M. Jackson & Company succeeded Jackson & Butts, who were in turn succeeded by D. I. Brown & Company, and that partnership gave place to Wilbour, Jackson & Company in 1875. Through various changes in the personnel of the partners, this latter style has since then been maintained. The present members of the house are Joshua Wilbour and Benj. A. Jackson. Mr. Wilbour is a director in the Industrial Trust Company, in the Rhode Island Safe Deposit Company and in the National India Rubber Company, and at present represents Bristol in the State Senate. Mr. Jackson entered the house as a clerk in 1864, and became a partner when the firm of D. I. Brown & Company supplanted B. M. Jackson & Company. Although bearing the same surname, he is not a relative of B. M. Jackson, one of the founders of the house. Mr. Jackson is president of the Globe National Bank, director and auditor of the Union Railroad Company, and director in the Bank of America Loan and Trust Co. For conservative, careful dealing, Wilbour, Jackson & Company have an unblemished record, and stand on the very highest financial level of reliability and trustworthiness.

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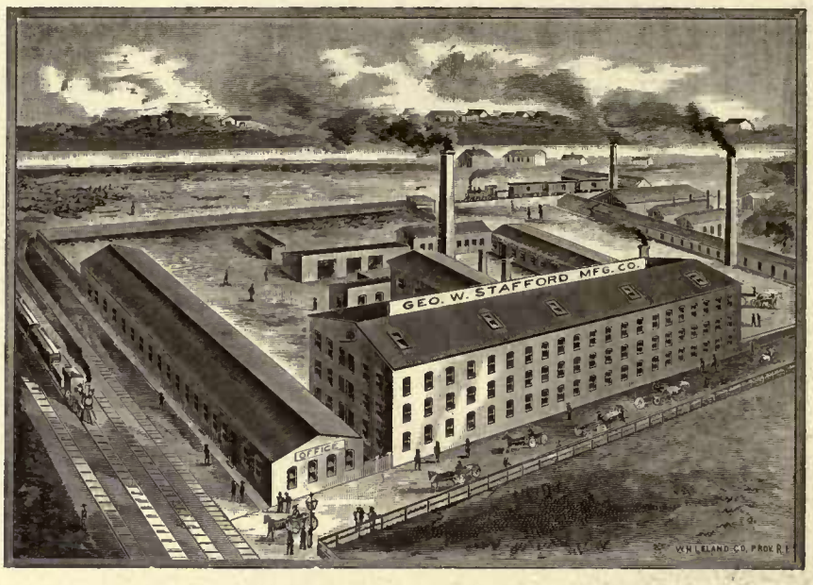
An industry that has made very little stir in the business world, but which nevertheless has contributed in a marked degree to the successful working of important departments in many of the leading establishments within this state and elsewhere, is the special line of manufacture carried on by the Providence Steam Trap Company. This concern was started in 1880, at its present location, No. 16 Codding Street, by Mr. Robert Newton, consulting and mechanical engineer. Mr. Newton is a native of England, where, after learning his trade as a mechanical engineer with the celebrated John Kennedy, he engaged in business on his own account, and acquired a medium fortune, but meeting with reverses, and losing nearly the whole of his property, he decided to come to America, and on the advice of friends located in Providence. Mr. Newton belongs to that rare class of men who may justly be called "born mechanics." In England such was his skill that he was often called upon as a consulting engineer in regard to some of the heaviest and most important work in process in the country. It



WORKS OF THE GEO. W. STAFFORD MFG. CO., PROVIDENCE, R. I.

was Mr. Newton's intention at first to introduce his compound steam engine and boiler, but on the advice of friends he decided instead to engage in the manufacture of specialties, chief of which was the Newton Steam Trap. The object of the device is to carry away the condensed water from steam engines or other steam connections, and by so doing to get more radiation, and effect a saving in the force. These results are more successfully achieved by this trap than by any other similar device, and such is its excellence that it is exclusively used in many of the most important industrial establishments in the country. The Providence Steam and Gas Pipe Company have applied 187, the Lowell Bleachery and Dye Works, Lowell, Mass., have in use 133, S. H. Greene & Sons, Clyde Print Works, River Point, have 87, the Providence Worsted Mills have about 40, and the trap is also used by such concerns as the Atlantic Mills, Fletcher Manufacturing Company, many of the cotton mills in Lowell, Lawrence, Fall River, Manchester and elsewhere, throughout the country, besides in numerous establishments engaged in other industries. At present there are 700 of these traps in use in twenty of the largest manufacturing concerns in New England and Pennsylvania. A market for the traps has been developed in all parts of the country, and the following leading concerns act as agents for it: Stearns, Rogers & Company, Denver, Col.; the Southern Machinery Company, Atlanta, Ga.; the H. Dudley Coleman Machinery Company, (limited) New Orleans; Chandler & Littlefield, Chicago; Chafer & Becker, Cleveland. The company also have agencies in St. Louis, Omaha, Minneapolis, Charlotte, N. C., Richmond, Va., Boston, Philadelphia and New York, while Miller Brothers & Mitchell manufacture the trap on royalty in Montreal, Canada.

Since June, 1885, Mr. Newton has been the sole owner of the business. At present his three sons, Robert W., Albert S. and Julian, are associated with him. Beside the steam trap, the concern manufactures Newton's Patent Compensating Valve, Oscillating Furnace Bars, Furnace Economizers, Temperature Controller, Combined Steam, Water and Dirt Separator, and a Separator and Strainer. After experimenting for years, Mr. Newton has succeeded in perfecting a Fuel Economizer and Mechanical Stoker combined, for which he recently obtained patents, and he is about to begin its manufacture. He owns four patents on the steam trap, and thirteen patents in all on his own specialties.

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The George W. Stafford Manufacturing Company, whose plant at present is situated on Harris Avenue and Acorn Street, was started in 1881 by George W. Stafford, who removed to Providence from Lawrence, Mass. The business at first was confined to the building of Jacquard machines, dobbies and "witches" used for fancy weaving. This is still a leading and important product of the plant. The business was begun on a small scale in a single room in the Builders' Iron Works on Codding Street, thence removing to Clifford Street, where, in 1884, an incorporated company was formed. Increased demand for larger facilities brought about a further removal to Point Street, and in May, 1889, the present quarters were occupied, covering over thirty thousand feet of floor space as compared with the 500 feet which was needed at the beginning. Since moving to the present location, the company has been manufacturing looms—though not to the exclusion of the earlier output of the plant. These have been manufactured less than a year, during which time over two hundred have been made for the Slater Cotton Company, of Pawtucket. There is also made at the works the "Morton let-off," the patent for which is owned and controlled by the George W. Stafford Manufacturing Company. This is designed to give an even let-off to the warp in weaving, is coming into favor and is regarded as an important invention. The officers of the company are Gardner C. Sims, president; George W. Stafford, treasurer and general manager; Charles H. Poland, secretary.

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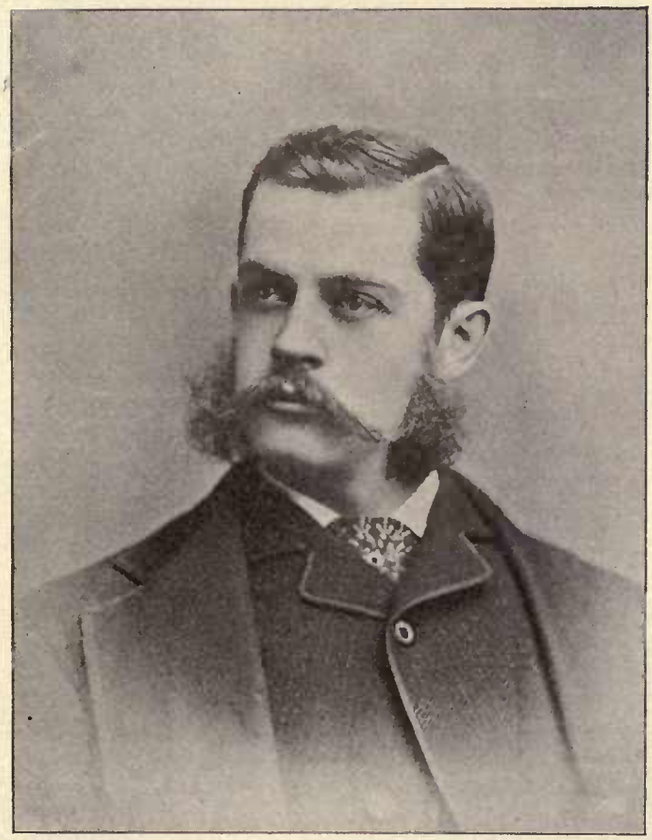
One of the oldest banks in Rhode Island is the Manufacturers National, which was started at Pawtucket in 1813. Oziel Wilkinson was the first president, and Samuel Slater the second, and they were both on the first board of directors. The institution was removed to Providence in 1831, and in 1865 was reorganized as a national bank. A three dollar bill of this bank signed by Samuel Slater as president in 1824 and made payable to N. G. B. Dexter is now in the possession of Mr. John H. Potter of Pawtucket and was an object of much curiosity during the Centenary Celebration. At present Providence has twenty-five national banks with a capital of over $15,000,000; six state banks with nearly $1,500,000; three trust companies with $2,000,000; and five institutions for savings with deposits of over $25,000,000.

The firm of William R. Walker & Son, architects, has a reputation by no means limited to the city of Providence. Some of the finest public buildings, churches and private residences in different parts of Rhode Island and neighboring states have been designed and erected by these gentlemen, who rank among the most prominent architects of the city. The business was established in January, 1865, by General William R. Walker, in the Merchants Bank Building, whence it was removed to the Reynolds Building on Weybosset Street and about ten years since to its present location, in the Vaughan Building on Custom House Street. General Walker's son, Colonel W. Howard Walker, entered the office in 1874, as a student, and became a partner in the business in January, 1881. Messrs. Walker & Son are prepared to give their personal attention to any work that may be entrusted to their care, and many of the elegant specimens of architecture in existence in this vicinity are enduring monuments of their skill.

Among the earlier pieces of architecture designed by General Walker are "Canonchet," the summer residence of ex-Governor William Sprague, the dwellings of W. F. and F. C. Sayles, Pawtucket, B. B. Knight, Providence, John C. Whitin, Whitinsville, and Henry F. Barrows, North Attleboro', Mass. The Narragansett Hotel and Providence High School were also built under his supervision. As the reputation of General Walker became more widely known, he was called upon to design public buildings, business blocks and churches,

GEN. WILLIAM R. WALKER,

OF W. R. WALKER & SON, ARCHITECTS.

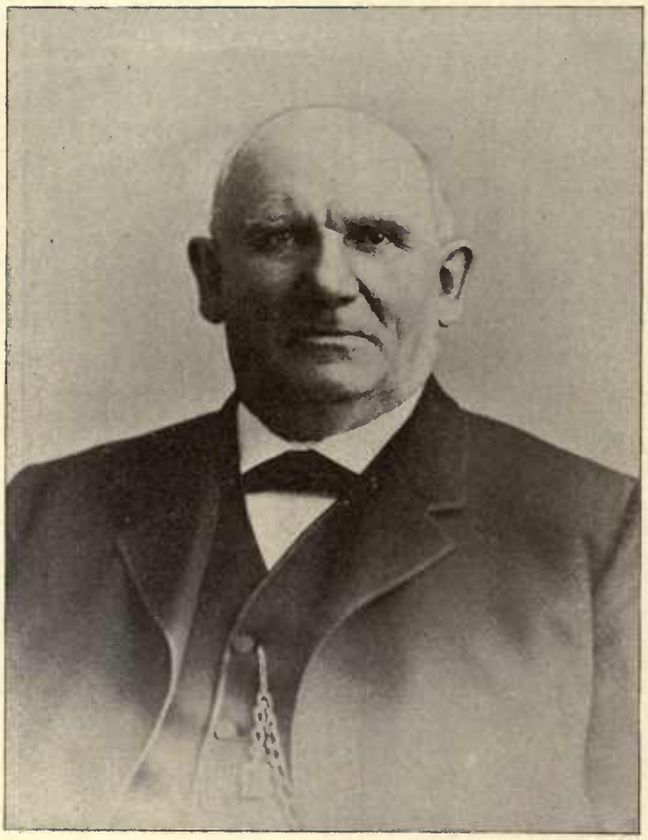


COL. W. HOWARD WALKER,

OF W. R. WALKER & SON, ARCHITECTS.

and in this class of work he has been particularly successful. Some of the notable specimens of the later work of the firm have been the reconstruction of the City Hall in Fall River, the Town Halls in East Providence and in Warren, Central Falls High School, Brown University Library, the Mellen House, in Fall River, Hail Free Library in Warren, Fall River National Bank Building, Corliss Safe Works in Auburn, Ponemah Mills, Taftville, Conn., Vineyard Street School House, Providence, Grove Street School House, Pawtucket, Freemasons' Hall, Vaughan, Daniels and Equitable Buildings in Providence, and Brown Building, Fall River. Some of the more important church edifices produced from their designs are the First Universalist, North Attleboro', First Baptist, Pawtucket, Christ Episcopal and Union Congregational, Providence, while among the private residences are those of John McAuslan, Elmwood, H. N. Campbell, Mrs. H. J. Daniels, Colonel Nicholas Van Slyck, Providence, Colonel Spencer Borden, Fall River, Alfred A. Reed, Warwick, General Olney Arnold, Pawtucket and Honorable D. G. Littlefield, Central Falls.

General Walker, the senior member of the firm, has been identified with the militia of the state for over thirty years, represented the old town of North Providence in the General Assembly several years, and was a member of the town councils of both North Providence and Pawtucket. Colonel W. Howard Walker, the junior member, has been a member of the Board of Assessors of the city of Pawtucket for the past six years, has been identi-



ENOS LAPHAM,

COTTON MANUFACTURER AND EX-LIEUTENANT-GOVERNOR OF RHODE ISLAND.

fied with the state militia since 1879, and is at the present time Assistant Quartermaster-General of the state. Both members of the firm reside in Pawtucket, and during the week of the Centenary took prominent part in the celebration, particularly on military day, General Walker being a member of the honorary staff of Chief Marshal General Olney Arnold, while Colonel Walker served the same gentleman as a member of his active staff.

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The cotton factory of Enos Lapham, at Centreville, in Warwick, R. I., is the largest mill in Rhode Island owned by a single man. It is on the site of one of the oldest mills in the state, and to the business enterprise of Enos Lapham and his brother, who was his associate in the manufactory until his decease a few years since, is largely due the prosperity of the town. From the beginning the two brothers were virtually partners in the industry, though the mills were run under the name of Benedict Lapham until his death.

Enos Lapham was born in Burrillville, September 13, 1821, and is a descendant of John Lapham who came from England to this country in 1650. His father was a Methodist local preacher, and Enos Lapham, reared in that sect, has been and is to-day prominently connected with the church of that denomination in Warwick. At a very early age, after what education he could obtain at the district school, he entered a cotton mill as a common hand, and soon became acquainted with the practical details of the business. In 1839 he and his brother Benedict hired a small factory at Frenchtown, East Greenwich. Enos Lapham was then 18 years old — and was the practical mill man and superintendent while his brother was the business manager. In 1852 the brothers removed to Warwick, and purchased from the executors of the will of the late John Green the estate in Centreville, embracing two-thirds of the water-power and all the machinery of the old mills which were built in 1794 and 1807, and were among the first to be erected in the State of Rhode Island. Here the manufacture of cotton cloth was begun with a capacity of 5,000 spindles. In 1861 large additions were made, and in 1871 the old mills were removed and a new structure 303 feet in length, and one of the finest mills in the state, was built. Mr. Lapham was his own architect, and in the erection of this building as well as in all the details and plans for the development of the industry, the two brothers worked in harmony. The mill contains 30,000 spindles and 641 looms, and furnishes employment to 400 operatives. Both steam and water-power are used, and a specialty of the business, in addition to the various grades of cotton cloth produced here, is the manufacture of shade cloths or window curtains. In 1883 Benedict Lapham died, and the entire property came into the possession of Enos Lapham, who is the present manager and sole owner of this valuable mill industry.

The property of Mr. Lapham, at Centreville, is unencumbered, and its accumulation is the result of earnest toil, economy and perseverance. Enos Lapham has been a prominent figure in town politics, and is held in high esteem by the citizens of Warwick of all shades of politics and religious belief. For years he has been a member of the town council of Warwick, represented the town in the State Senate in 1886, and was elected lieutenant-governor for the year 1888-9. At the present time he is a member of the Senate, and is president of the Centreville National Bank and the Warwick Institution for Savings.

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The Hamlet Mills were built by Mr. Edward Carrington in or about the year 1826. In 1842 the mills passed into the hands of Mr. George S. Wardwell, and in 1859 they became the property of Mr. Isaac M. Bull. Mr. Bull died in 1884, and the mills were idle for about a year, when Messrs. Tarbell and Harris became the owners. In 1889 Mr. Tarbell sold his interest to Mr. Frank Harris, the present owner. The mills manufacture shirtings, sheetings and yarns. The selling agents are Messrs. Coffin, Altemas & Company, in New York, Philadelphia, Baltimore and Boston. The mills are situated in the southern part of the city of Woonsocket.

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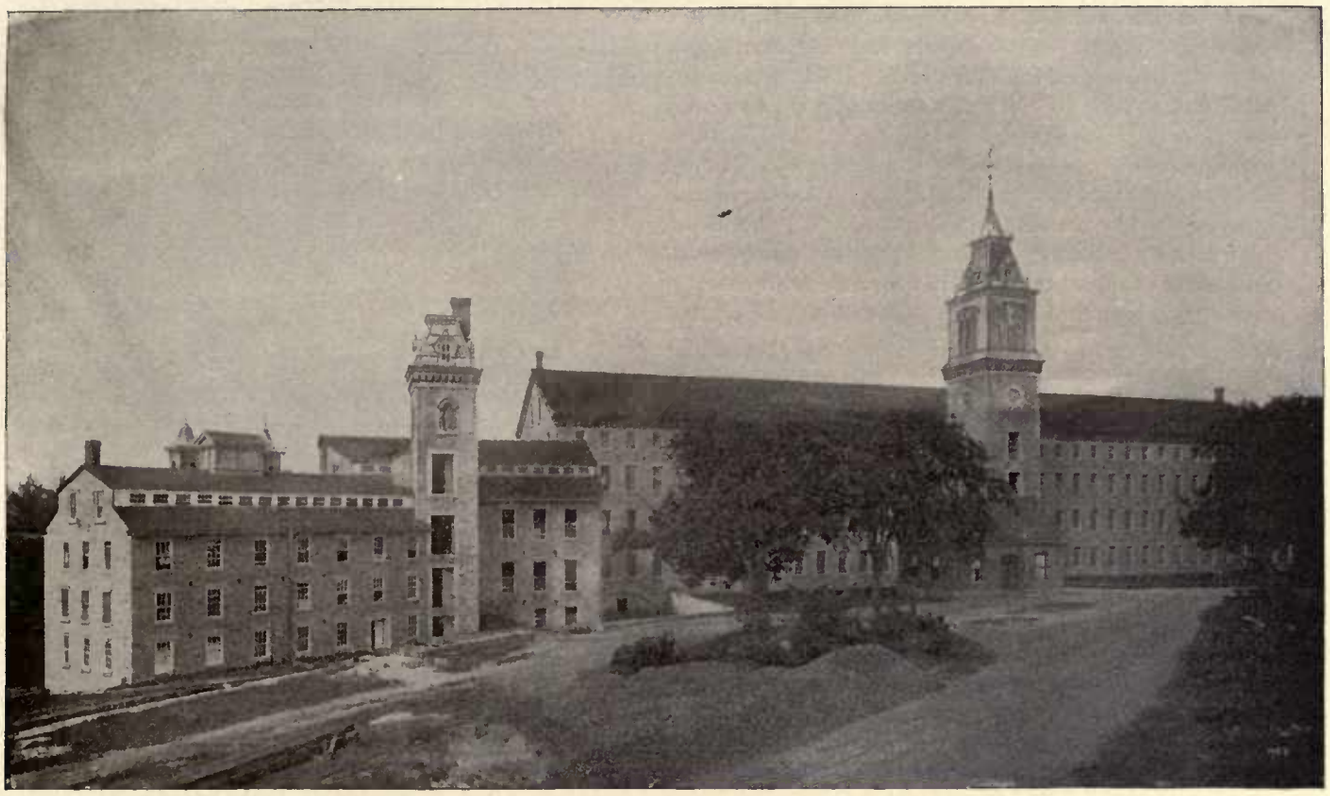
Early last summer the attention of the multitudes who rode on the then new cable road in the city of Providence was attracted by a new building that was being erected on the shores of the Seekonk, just south of the Red Bridge, and facing Pitman Street. As the cars swung around into Waterman Street, the edifice came sharply into view, and usually provoked the inquiry: "What is that building going to be?" When it was completed, as the signs on the top and on the side proclaimed, it proved



CENTREVILLE COTTON MILL, ENOS LAPHAM, PROPRIETOR.

to be the works of the Manville Covering Company, makers of steam pipe and boiler coverings. The chief promoter of this enterprise is Charles B. Manville, a Western man, residing in Milwaukee, and characterized by all the vim and enterprise usually associated with residents of that section. Mr. Manville a number of years ago invented a covering for steam pipes and boilers that had many advantages over any previously in use. He secured patents and immediately proceeded to manufacture, establishing a company at Milwaukee, Wis., six years ago, which has since developed into a large concern. The covering had so many excellencies that not only leading manufacturers in the West began to use it, but so many orders commenced to come from eastern parties that Mr. Manville decided to manufacture in Providence, and accordingly located here last year. The Providence concern although called by the same name and making the same goods, has no connection with the establishment in Milwaukee, but Mr. Manville is the leading owner in both corporations.

The covering made by the Manville Company is composed of sheep's wool or shoddy, compounded with a non-combustible solution, largely composed of fire clay, and when applied to steam pipes prevents the conden-

HAMLET MILLS, WOONSOCKET.

sation of the steam and radiation of the heat, by this means affecting a great saving in fuel and ensuring a more effective service from the steam. It has been calculated that on each 100 feet of uncovered pipe there is a loss of fuel equal to $64.47 by radiation and condensation, and this sum would be saved by a covering which would absolutely prevent this result. Such a covering is the one prepared by the Manville Company, as it retains the heat and excludes the cold better than any other in use, while it is also non-combustible, is practical, durable and contains no harmful ingredients that will destroy or rust pipes and boilers. The wool and clay together form a tough mass, which at the same time has great elasticity. It is applied directly to the pipes, boiler or other surfaces in a plastic state, strong muslin is then wound around it spirally, and in a few hours the whole composition dries into a compact, impervious mass. The outer surface is then smoothly finished with a fire-proof compound. The company also makes a sectional covering of wool felt paper, that comes in lengths and can be easily applied to all styles of pipes; a covering for brine and ammonia pipes; and a special covering for superheated surfaces.

The works are well situated, being directly on the water front, so that vessels can come up to the back of the building, and it is the intention of the company to erect a dock the coming season, making it possible to land in the yard of the works the heavy materials used in the manufacture.

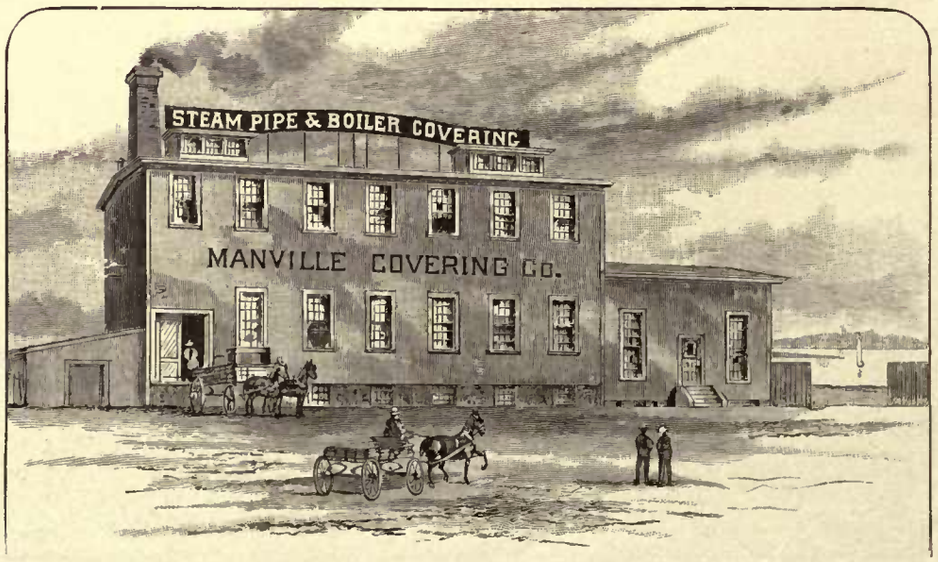
* * * * *

The driving of what is known as artesian wells is a branch of business which has had considerable development in New England within the past ten years. These wells ordinarily furnish water for manufacturing purposes, instead of the city or town supply. It is equally good, and in many cases the possession of artesian wells is very advantageous, financially, to a manufacturer or corporation. Mr. Philip N. Lothrop, whose place of business is on Fenner Street, in Providence, is one of the prominent men engaged in this business, having been connected with it for ten years. Until within a year

PHILIP N. LOTHROP,

OF P. N. LOTHROP & COMPANY.

he had an office at the Mechanics Exchange—and from Providence as headquarters, he is engaged at different parts of New England in sinking wells. These are usually from six to ten inches in diameter, and vary all the way from fifty to one thousand feet. They do not flow in New England—in some parts of the South and West a natural flow is obtained from an artesian well—but are the same as an ordinary well except in diameter. The water is pumped by steam, by a wind engine or by hand. The preponderance of power in New England is from the air-motor, furnished by Mr. Lothrop, who is agent for Rhode Island and Southern Massachusetts. This motor is made of steel or malleable iron—never of wood—and there have been put in, at different parts of New England, the past year, over three hundred of these motors for furnishing power to pump water from artesian wells. The increase in the business is shown by the fact that when Mr. Lothrop first came to Providence there was no one outside of Boston drilling any wells larger than three inches. To-day there are owned in the vicinity of Providence about fifteen outfits, employing on an average fifty men. Mr. Lothrop has been very fortunate in sinking wells, and within the past year has had some large contracts, and the pursuance of his business takes him from Providence a large portion of the time. Everything in the matter of furnishing a water supply, from a small well to a village supply of fair proportions, is in the line of work for which Mr. Lothrop is prepared. The business is done under the name of Philip N. Lothrop & Company.



WORKS OF THE MANVILLE COVERING COMPANY, PROVIDENCE, R. I.

Chapter IX.

THE COTTON MANUFACTURE IN NEW ENGLAND.

Position of New England as the Home of the Cotton Manufacture in America—Fall River—Waltham—Lowell—Lawrence—New Bedford—Chicopee—Clinton—Mills Throughout Massachusetts—Manchester—Lewiston—Saco and Biddeford, and Other Places in Maine—Nashua, Dover, Great Falls and the New Hampshire Mills—Connecticut's Villages and Mills—Jewett City and the Family of John Slater—Mills in Vermont—Some Leading Concerns in Various Parts of New England.

A SPINNING EXHIBITION, BY BOSTON MAIDENS, ON THE COMMON IN 1753.

About three-fourths of the entire amount of cotton manufacturing in the United States is carried on in New England. Massachusetts leads all the other states, while Rhode Island, Connecticut, New Hampshire and Maine follow in the order named. Rhode Island, however, produces a much larger amount of cotton goods than any other section in the country in proportion to her population and extent of territory. Vermont is at the foot of the list, and does much less than a number of the middle and southern states. The principal centres of the manufacture are consequently in New England, at Fall River, Lowell, Lawrence, New Bedford, Providence and vicinity, Manchester, N. H., and Lewiston, Me., while on many of the rivers are smaller places which help very materially to swell the total. Accounts of the beginning of the industry in Lowell, Fall River, Lawrence and Manchester have already been given, but a brief summary of the subsequent development of those places and of some of the other centres will be of interest.

Fall River, now the principal seat of the cotton cloth manufacture in America, began the industry with two small mills in 1813, and was then a little village known by the name of Troy. It consisted of about thirty dwelling-houses, three saw mills, four grist mills, a fulling mill, a blacksmith shop with a trip hammer, several small stores, while a few small sloops constituted all the shipping. Between 1820 and 1830, a number of cotton mills were erected on the hillside, along the banks of the Quequechan. In 1821 the Fall River Iron Works were established, occupying the lowest water-power, and for four decades this corporation exercised the controlling influence in building up and directing the industries of the place. Its managers and owners were the large land owners and leading capitalists, and the corporation owned all that part of the shore line most eligible for wharfage. In 1825, for the purpose of the preservation and control of the water-power the Watuppa Reservoir Company was formed, and in 1832, built a dam, two feet in height, just above where the river begins its descent down the hillside. In the distance of about a half a mile the total fall is about one hundred and thirty-two feet and the volume of water 122 cubic feet a second. The first mills were built directly across this stream, and were situated on the hill-side, most of the water-wheels being placed in the bed of the river. The river is uniform in its water supply and has never been subject to freshets, the water being obtained from great natural reservoirs, the Watuppa Ponds, so that the building of the mills in this manner was perfectly safe.

In 1859, a movement was begun which had a great influence on the future development of Fall River, and

BORDEN, ROBINSON AND DAVOL MILLS, FALL RIVER.

took eventually, the controlling interest in its affairs out of the hands of the Iron Works Company. In that year, the Union Mills Company was started, the first corporation to raise its capital by general subscription, and such was the success of this venture, that in a few years other similar companies were formed, until to-day, the Fall River factories are all operated by joint stock corporations, and the business could not probably have been developed to its present immense proportions except through this means of combining multitudes of small resources. Up to 1868, seven more corporations were organized, some of them building more than one mill, and all were very prosperous. The years 1871-2, however, showed the most remarkable development of these corporations, as in that period fifteen were organized, factories erected involving an outlay of $13,000,000, adding 500,000 spindles to those previously in operation, furnishing work for 6,000 people, and thereby adding to the population of the city 20,000 persons. In 1865, Fall River had fifteen cotton mills with only 241,218 spindles; in 1875, there were thirty-eight mills with 1,280,000 spindles, and during this same period the production of cotton cloth had increased from 30,000,000 to 330,000,000 yards per annum. The introduction of the principle of public subscription to the stock of the mill corporations in the case of the Union Mills was still further developed in 1867, when the Merchants Manufacturing Company was organized with a capital of $800,000 divided among 250 stockholders, and the Mechanics Mills in 1868, with a capital of $750,000, and 328 stockholders, no one of whom owned more than $2,500.

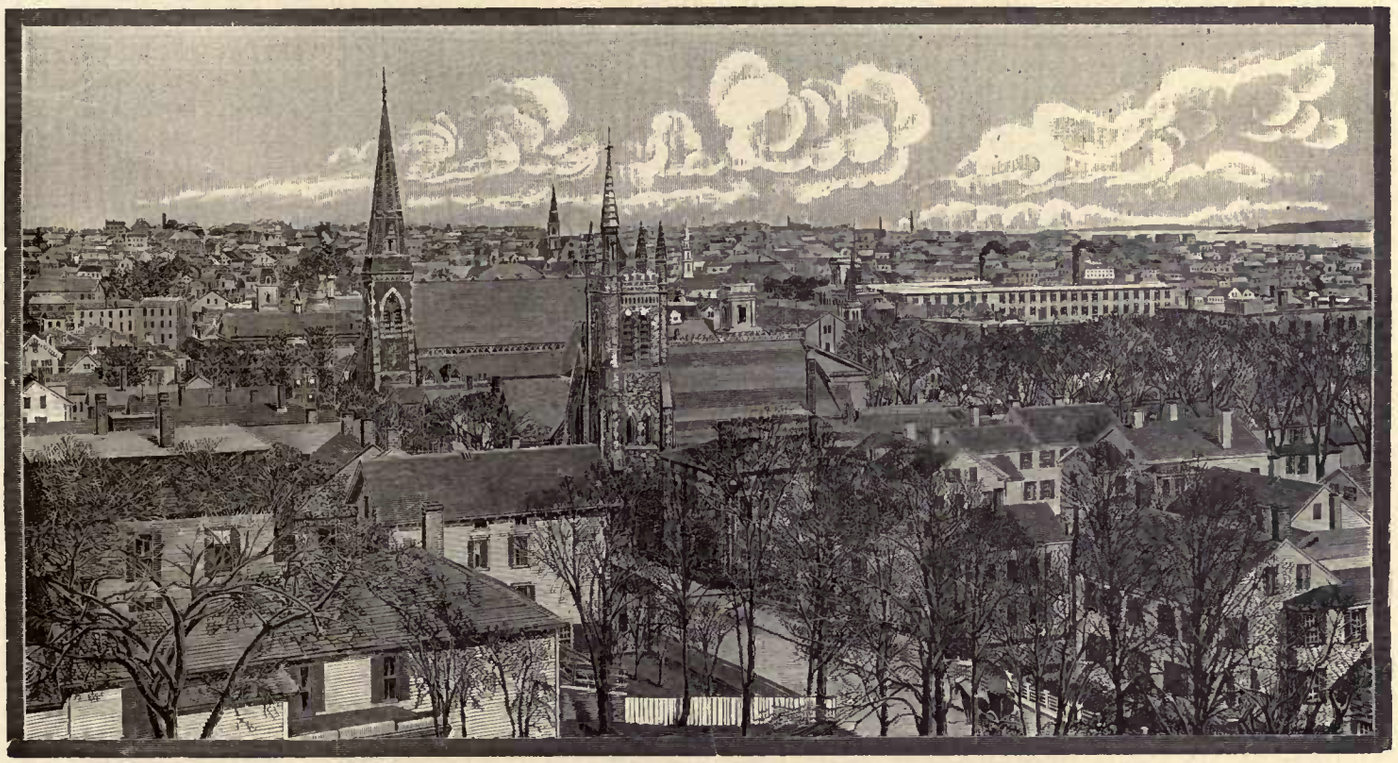
The older mills, those built previous to 1860, were nearly all located on the river on the last half-mile of its course, and were at first operated entirely by water-power. The mills built between 1860 and 1870 were mostly located on the banks of the river, from the brow of the hill back to near the head where it issued from the ponds, and were all steam-mills. Some of those built in 1871-2 and subsequently, were also erected in this region; others in the northern sections of the city on the banks of the Taunton River; several on the shores of the ponds to the eastward; and the remainder on Laurel Lake, a small body of water between the territory of Fall River and Tiverton to the south. At present there are forty corporations in Fall River engaged in the cotton manufacture, operating sixty-five mills, the total horse-power utilized is 47,435, of which about 1,500 is water-power obtained from the wheels still in use. The capital invested is more than twenty-one millions of dollars. Six hundred millions yards of cloth are produced annually from 250,000 bales of cotton, and the number of persons engaged in the business is 22,000.

Waltham, Mass., is entitled to a place of honor in the annals of the cotton manufacture, as here the American system of arranging all the processes under one roof was first put in operation, and here also the power-loom was started, both these achievements being due to the genius of Francis C. Lowell. The scene of these two events was the factory of the Boston Manufacturing Company. The projectors of this company were F. C. Lowell, Nathan Appleton and Patrick Tracy Jackson, and a charter was granted in 1812, with an authorized capital of $400,000, but it was decided to raise only $100,000 until the experiment was tried. Messrs. Lowell and Jackson furnished the most of the capital, and February 23, 1815, a patent was granted to them jointly, for the power-loom. They also inaugurated at Waltham boarding houses for the operatives, a plan of Mr. Lowell which was radically opposed to the English system, and this plan was followed in Lowell and other factory places. The success of this company was very marked at the outset, and from it Mr. Appleton and his coadjutors were induced to enlarge operations at Waltham and to look for power elsewhere. Such a power was found at Pawtucket Falls, on the Merrimack River, in Chelmsford, and here was established, by the same men who organized the Boston Manufacturing Company, the great cotton

VIEW OF THE MILLS ALONG THE QUEQUECHAN, FALL RIVER.

manufacturing city of Lowell. In the machine shop in Waltham, under the supervision of Paul Moody, the machinery for the two mills of the Merrimack Manufacturing Company was built, and Mr. Moody himself, being released from a contract with the Boston Manufacturing Company, removed to Lowell, and there started a machine shop in which a large share of the machinery used in the mills in that place was built. Cotton cloth in various widths, for sheetings and shirtings, as well as cotton hosiery, and underwear, is manufactured at Waltham, the capacity of the mills at present being 58,600 spindles and 1,000 looms, and the capital of the corporation is $800,000.

The first mill of the Merrimack Company was built at Lowell in 1823, and the next year a large machine shop was erected. The locks and canals at Pawtucket Falls on the Merrimack River, were originally built for the purpose of facilitating navigation, but were destined to serve a far different purpose. In 1822 the Merrimack Company became possessed of this property, but in 1826 the land, water-power and machine shop was set off to the old corporation that had formerly existed — the Proprietors of Locks and Canals. The capital of this corporation was increased to $600,000, and it immediately set about the improvement of the water-privilege by the building of new canals, the laying out of streets, and entered extensively upon the business of selling water-power, mill sites and building lots. The Merrimack Company continued to increase its plant from year to year, until at present in its cotton mills it operates 156,480 spindles and 4,607 looms, while it also has a calico print work running twenty machines. The excellent water-power, favorable location and easy terms on which land and water rights could be secured, quickly attracted manufacturers to Lowell, and in the decade from 1826 to 1836, the foundations of the majority of the present extensive concerns were laid. The Hamilton Manufacturing Company started in 1826, the Appleton Company in 1828, the Lawrence Manufacturing Company in 1831, the Tremont and Suffolk Mills in 1831, the Boott Cotton Mills in 1835, the Lowell Bleachery and Dye Works in 1828, the Massachusetts Cotton Mills in 1839. The industry of the city has however not been confined to cotton, as some of the most important corporations are engaged in the woolen manufacture, while there are extensive shops for the construction of cotton and woolen machinery. The Lowell Manufacturing Company, which originally started a cotton mill in 1828, now carries on very extensively the manufacture of carpets; the Middlesex Mills started in 1830, make suitings, coatings, cassimeres and other woolen goods; the Belvidere Woolen Manufacturing Company makes flannels and dress goods; and a number of smaller establishments are also engaged in the woolen manufacture. The capital invested in the cotton industry alone in Lowell amounts to more than eighteen million dollars, while over one million spindles, and about thirty thousand looms are operated.



VIEW OF FALL RIVER FROM THE HIGH SCHOOL BUILDING.

Lawrence, situated on the Merrimack River, ten miles below Lowell, owes its origin to some of the men who were instrumental in building up that place. The two cities are usually named together as in reality they form one cotton district. The water-power here was developed by the Essex Company, which in 1845 built a dam

over a mile in length and entered upon the business of selling mill-sites and water-privileges. The first factories erected were the Atlantic Cotton Mills in 1846, and these factories now contain over 100,000 spindles and 1,000 looms. The leading corporation, the Pacific Mills, started in 1853, and now one of the largest concerns in the country, is engaged in the cotton and worsted manufacture and in calico printing. In its cotton mills 180,000 spindles and 4,000 looms are operated, and prints and fancy cottons are made, while in the print works thirty machines are used; in its worsted mills are 25,000 spindles, 2,686 looms and fifty sets of forty-eight-inch cards, the goods produced being delaines and similar fabrics. Other important cotton manufacturing concerns are the Pemberton Company, the Everett Mills, the Lawrence Duck Company and the Lawrence Line Company. There are a number of establishments in addition to the Pacific Mills engaged in the woolen industry, the most important of which are the Washington Mills, the Arlington Mills, and the Wright Manufacturing Company. Over twelve thousand persons are here engaged in the textile factories.

THE DURFEE HIGH SCHOOL, FALL RIVER.

ERECTED BY THE WIDOW OF BRADFORD DURFEE, IN MEMORY OF HER SON, B. M. C. DURFEE.

Although the city of New Bedford cannot be said to be one of the original homes of the cotton industry in America, it has become at the present time an important centre of the manufacture, and is only surpassed in the amount of capital invested and in the capacity of its factories by Fall River, Lowell, Lawrence and Manchester, N. H. Indeed it is a question whether it does not surpass the last two named in these respects. The first cotton factory was erected in 1847 by the Wamsutta Mills corporation, Thomas Bennett, Jr., being the agent and superintendent. Mr. Bennett continued in these positions until 1874. The second mill was built in 1854, the third in 1860, the fourth, a mammoth brick structure, in 1868, a fifth mill in 1875, and finally in 1882, the last of the series No. 6, was erected. These factories are situated in one cluster on the banks of the Acushnet River, an inlet of Buzzards Bay, at the north part of the city. The Wamsutta corporation employs in its six mills about 2,600 persons, operates 204,000 spindles and 4,500 looms, and the capital stock is $3,000,000. The other cotton corporations are the Potomska Mills, the Acushnet Mills, the Grinnell Manufacturing Company, the New Bedford Manufacturing Company, the City Manufacturing Company, the Howland Mills, the Bennett Manufacturing Company, and the Hathaway Manufacturing Company. The mills of these corporations have all been erected since 1871, and the greater number of them since 1881. They are nearly all large structures with the latest improvements in machinery and facilites. The capital invested amounts to more than $8,250,000, about 700,000 spindles and 13,000 looms are operated and 6,000 operatives employed. In the early part of the century New Bedford was famous as the greatest of all whaling ports, and her citizens were either engaged in this business or in occupations relating to the fitting out of the ships and the manufacture and shipment of the oil. While it still retains its relative rank as a whaling port there has been a great decline in that industry. The increase in the cotton manufacture, came at an opportune time for the city and has been the means of enabling it to advance to a higher position in population and business than ever before.

One of the most prominent concerns in New Bedford is the Morse Twist Drill and Machine Company, which controls many patents on their own productions, and has consequently a very large field to itself. The extensive factories are located in the south part of the city, and many skilled mechanics are employed. The New Bedford Cordage Company, established in 1842, has an extensive establishment in the western part of the city. The New Bedford Copper Works, situated on the water front, near the Wamsutta Mills, was started in 1860, and at present makes copper shells for calico printing, and a great variety of rolled copper work. At the southern part of the city, facing the harbor, is the Mount Washington Glass Works, established in 1869. In the same neighborhood are the the works of the Pairpoint Manufacturing Company, makers of silver-plated ware, established on a small scale in 1880, but as the business continuously developed the present extensive buildings were erected as the necessity for better accommodations arose. On Fish Island, which is crossed by the long bridge connecting New Bedford with Fairhaven, is the oil works of William F. Nye, said

to be the largest manufactory of sewing machine, watch and clock oils in the world. New Bedford surpasses the majority of the cotton centres in the variety of her industries, which beside those already mentioned, include the making of boots and shoes, the construction of carriages, the working of iron and brass, the manufacture of flour, of picture frames, of boom lances and guns for use in whaling, the making of bobbins and spools, and reeds and harnesses for the cotton factories, the construction of sail and row boats, and the making of many other articles.

On the southern bank of the Chicopee River, at Chicopee, Mass., about three miles from Springfield, are situated several large cotton factories — all, however, at the present time, being the property of two corporations. The larger as well as younger of these is the Dwight Manufacturing Company, incorporated in 1841. Prior to this there had been established the Cabot Manufacturing Company, in 1832, and the Perkins Mills in 1836, and a union of these two was effected in 1851, and in 1856 the consolidation of the three companies was accomplished, the corporate title of the new concern being the Dwight Manufacturing Company. Seven mills were owned by the three companies; this number was not increased after the consolidation, but the productive capacity of each was enlarged. The finer grades of cotton made here received an award at the Centennial; the coarser grades are exported. The capital at present is $1,200,000, and there are 120,000 spindles and 3,200 looms. The Chicopee Manufacturing Company is the oldest cotton establishment in the place, having begun business in 1822, and manufactures flannels, sheetings and shirtings, with a capital of $1,000,000, and a capacity of 67,000 spindles and 1,900 looms.

Clinton, Mass., is situated on the Nashua River, and here, in 1844, was established the first mill for the manufacture of ginghams. The company was organized by Erastus B. Bigelow, who had previously established in Lowell the manufacture of ingrain carpets. The industry became known as the Lancaster Mills, and the ginghams early attained a high reputation. The capital stock which at first was only $500,000, was nearly doubled within five years, and additions in the buildings and capacity of the mills have been made from time to time until there is, at present, over two hundred and fifty thousand square feet of flooring, while 60,000 spindles and 2,800 looms are operated. The capital is now $1,200,000. There is also, at Clinton, the Griswoldville Manufacturing Company, which makes sheetings and shirtings, and runs 18,000 spindles and 402 looms; and the Clinton Yarn Company, which turns out yarns and batting.

After having given accounts of the great centres, it would be impossible to enter into much detail in regard to the remainder of the cotton manufacture throughout Massachusetts, as on nearly every stream in the state factories are located, and almost every village has one or more establishments that carry on some branch of the business. Of the total number of 14,457,024 spindles reported as running in the whole country in 1889, Massachusetts had 5,905,875, or more than two-fifths. The offices of the mill companies are chiefly located in Boston. The most important places in addition to those mentioned are Holyoke, with over 200,000 spindles in operation; Taunton, with about 150,000 spindles; Worcester, Salem, Adams, and North Adams, Amesbury, Blackstone, Newburyport, Millbury, Manchang, Webster, Fitchburg, Easthampton, Fishdale, Whitinsville, Northbridge, Thorndike, Southbridge, West Warren, Oakdale, Hebronville, Dodgeville, Attleboro and North Attleboro, Canton, Turner's Falls, Williamstown, Winchenden, Bond's Village, Plymouth, Shirley, South Hadley Falls, Springfield, North Uxbridge, Walpole, Gloucester, Housatonic and other towns and villages.

NEW BEDFORD, FROM THE HARBOR.

The story of the founding and development of Manchester, N. H., has already been told in the chapters devoted to Samuel Slater and the pioneer manufacturers. There are only three other corporations beside the original one, the Amoskeag Manufacturing Company, engaged in the cotton manufacture, but they are all very extensive concerns, each operating a number of mills. These corporations are the Manchester Mills with a capital of $2,000,000; the Stark Mills, with $1,250,000; and the Amory Manufacturing Company with $1,350,000. The combined capital of the four corporations, the Amoskeag having $4,000,000, amounts thus to the great sum of $8,600,000, thereby placing Manchester next to if not ahead of Lawrence in this respect. A considerable

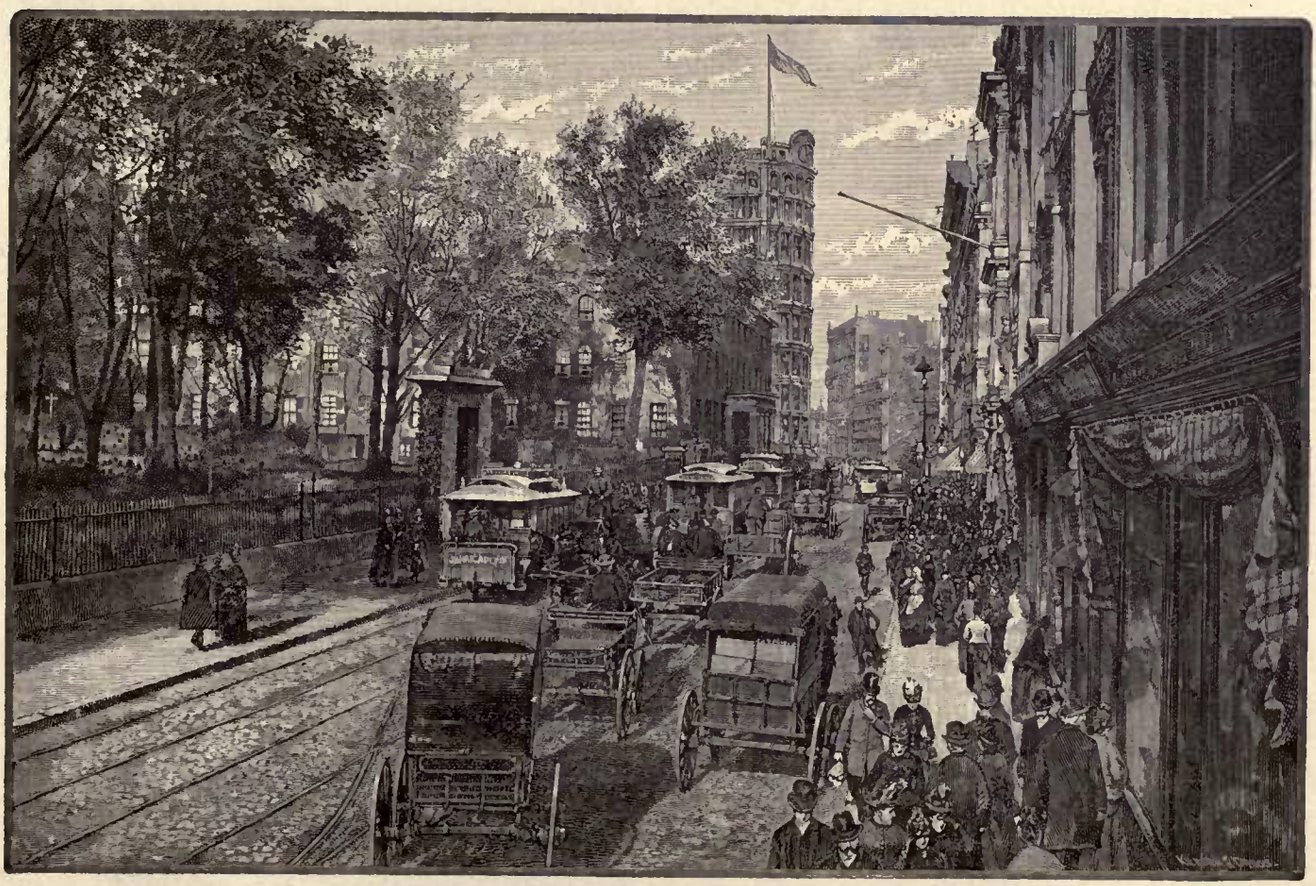
amount of woolen manufacturing is also carried on by the Manchester Mills, the Devonshire Mills, the Everett Knitting Works and some smaller concerns.

Lewiston, Maine, whose mills are situated on the Androscoggin River, has a large amount of capital invested in the cotton industry. The water-privilege and power in Lewiston are in possession of the Franklin Company, which is the successor of the Lewiston Water-Power Company, and is exceedingly valuable. When Lawrence J. Harris, who emigrated thither from Dracut in 1772, brought materials for the erection of mills, he was to receive two large lots of land around the falls, and 100 acres for each of his five sons, the title of which is included in the property held by the Franklin Company. One of the first mills started by this company was the Porter Mill, in 1853, and this was purchased in 1866, by the Continental Company, which has since operated it, and with the additions and improvements is the largest corporation in Lewiston. This mill when first occupied by the Continental Company contained only 27,000 spindles, and was scarcely one-third its present size. To-day it has been enlarged to a frontage of 787 feet, with six floors, giving a superficial area of over eight acres, and there are 70,272 spindles, and 1622 looms. The capital is $1,500,000, and the entire product is a brown cotton cloth, known as the Continental, never bleached, thirty-six and forty inches wide, intended for sheetings and shirtings. The Bates Manufacturing was incorporated in 1852, with a capital of $1,000,000, though Benjamin E. Bates had been making cotton cloth there before that time. In 1848 the Bates Mills consisted of two factories, with a capacity of 34,000 spindles, and the manufacture of woolen had blended with that of cotton. In 1868 Cyrus I. Barker, who had been engaged previously in the York Mills, in Saco, and with A. Campbell & Company, of Philadelphia, was secured by Mr. Bates to take charge of the mills. At the beginning of Mr. Barker's service, 18,000,000 yards of cotton cloth were annually put upon the market, but a radical change was made, and ginghams, fancy shirtings, cheviots, cottonades, dress goods and varied spreads and quilts were manufactured. Special machinery was invented and patented by Mr. Barker for the bleaching of quilts, and the product of the mill became a successful competitor of the Marseilles quilt, which had been made in France. There are also made here dress goods which were formerly manufactured only in Europe. The present capacity of the mill is 69,000 spindles and 1,664 looms. The Androscoggin Company, which was organized in 1860, with a capital of $1,000,000, has three large mills, which turn out sheetings, shirtings and sateens, and a large number of seamless bags, used principally by the Western farmers for the transportation of grain to the railroads. There are in these mills 61,718 spindles and 1,438 looms. Other mills are the Hill Manufacturing Company, organized in 1853, with a capital of $1,000,000, and a capacity of 54,000 spindles and 1,162 looms; the Lincoln Mills, with a capital of $250,000, operating 22,000 spindles and 436 looms in the manufacture of sheetings and shirtings; the Lewiston Mills Company, manufacturing tickings, denims, duck, cottonades, etc., with a capacity of 22,000 spindles and 588 looms; and the Avon Mill, started in 1882, chiefly for the making of quilts.

At the head of tide water on the Saco River, in Maine, are situated Saco and Biddeford, on opposite sides of the river, and in each of these places the manufacture of cotton goods is the important industry. In 1831, March 16, the York Manufacturing Company was chartered, becoming the successor of the Saco Manufacturing Company, in Saco. The mills of the old company had been burned, and Samuel Batchelder, previously the manager of the Hamilton Mills in Lowell, made arrangements with the owners of the falls to rebuild. The original capital was $600,000, and this company was organized by Mr. Batchelder at the solicitation of different Boston capitalists desirous of establishing new manufacturing industries in various places. The business rapidly developed and five large mills were finally erected where are manufactured ginghams, denims, dress goods, cottonades, etc. Here Mr. Batchelder invented a stop-motion for the drawing frame, and it was put in operation in these mills before a patent was taken out in this country. In 1846, Mr. Batchelder retired from the company, and in 1856, the stock had become so depressed that it sold for about half what it brought ten years previous. He was persuaded to return and take the treasurership which he retained until 1868, during which time the stock advanced from $600 to over $1,200 per share. The capital is now $900,000, and the capacity of the mills is 50,000 spindles and 1,567 looms. Later on, in Biddeford, were started the Laconia and Pepperell Companies, the former being incorporated in 1845, with a capital of $1,000,000, and the latter starting in 1850, with a capital of $1,200,000. Each corporation has three large mills, manufacturing cotton goods in different varieties and the two turn out a million and a half yards of cotton cloth, in the varied widths, every four weeks. The Laconia has a capacity of 79,000 spindles, 2,226 looms, and the Pepperell 105,000 spindles, 2,900 looms. The Cabot Manufacturing Company, in Brunswick, is one of the largest concerns in the state, and is engaged in the making of light sheetings, its capital being $600,000, while its works contain 49,000 spindles and 1,150 looms. Other places in Maine which are engaged in the industry are Augusta, Waterville, Saccarappa, Auburn, Hallowell, Springvale, South Berwick, Winthrop and Yarmouth. The capital invested amounts to between fifteen and twenty millions, and 884,722 spindles were in operation in 1889.

The ten years from 1820 to 1830, witnessed the establishment and formation of many companies for the development of the cotton industry in different parts of New England, and during that period the water-privilege at Nashua, N. H., was first made use of. In 1820, the idea of building at the falls at that place suggested itself to some capitalists. In 1822-23, they purchased a large portion of the lands in and around the village and at the falls, and a charter was obtained in June, 1823, for the Nashua Manufacturing Company, which was incorporated with a capital of $1,000,000. It has erected four large mills and has developed a large business in sheetings, shirtings, prints and cotton flannels. Both steam and

THE STATE HOUSE, BEACON HILL, LOOKING FROM THE COMMON.



OLD GRANARY BURYING GROUND AND TREMONT STREET,

LANDMARKS OF BOSTON.

water-power are now used, and the capacity of the mills is 95,984 spindles and 2,506 looms. In May, 1825, land was purchased from the Nashua Company and mills erected for the manufacture of woolen goods, — the factories being called the Indian Head Mills. The enterprise was not successful, and in 1828, the property was sold to a new company which was incorporated in 1830, under the name of the Jackson Manufacturing Company, with a capital of $600,000. The old machinery was taken out and cotton machinery substituted. The two mills contain at present 40,448 spindles and 1,353 looms. There was also established in 1868, the Vale Mills with a capital of $100,000 for the manufacture of sheetings, and their capacity is now 5,000 spindles and 110 looms.

The mills of the Cocheco Manufacturing Company, in Dover, N. H., on the Cocheco River, have made a great change, since the beginning of the industry, in the development and growth of the place. The company was incorporated June 17, 1827, and succeeded the Dover Manufacturing Company, whose works it purchased December 1, 1829. The old mill of this company had been built on the upper falls, and was torn down in 1837. The plant of the Cocheco Company consists of four large brick mills on the lower falls and here are manufactured the well-known "Cocheco Prints." The capital of the incorporated company is $1,500,000. Steam and water-power are employed, and the four mills have a capacity of 109,000 spindles and 2,575 looms.

During the years 1821 and 1823, Isaac Wendell, of Dover had purchased land and privileges on both sides of the Salmon Falls River, with a view of establishing cotton factories on the stream, and at Somersworth, N. H., now Great Falls, he had begun the erection of stores, boarding houses and work shops when the Great Falls Manufacturing Company was formed in 1823. The services of Mr. Wendell were engaged as resident agent, and both cotton and woolen goods were manufactured. Prior to 1835, broadcloths and carpets were made, and at one time the mill produced the largest amount of these goods in the United States. The fabrics were fine and compared favorably with imported goods, but the manufacture was not profitable and the mills were equipped entirely with cotton machinery. The appointment in 1844 of Patrick Tracy Jackson as treasurer, resulted in doubling the capacity of the looms of this company, and added greatly to its prosperity. There are seven large mills, manufacturing cotton goods in great variety, giving employment to nearly two thousand operatives. The capacity is 129,000 spindles, 3,000 looms, and the company is capitalized at $1,500,000.

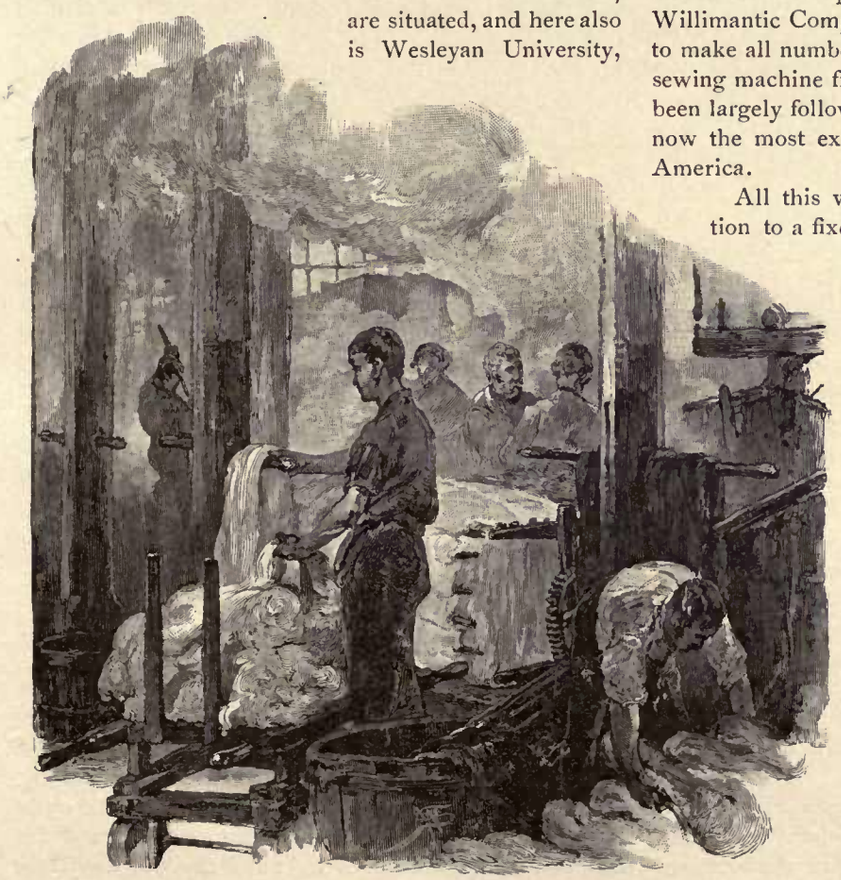
Other places within the bounds of New Hampshire in which the cotton manufacture is at present carried on to a considerable extent are: Suncook, where there are three companies operating 93,000 spindles; Salmon Falls, where the manufacturing company of the same name started business in 1822, and now has large mills containing 60,000 spindles and 1,300 looms; Newmarket, the home of the Newmarket Manufacturing Company, dating back to 1823, which now runs 53,352 spindles and 1,400 looms, and makes fine cottons; and Greenville, Hooksett, Penacook, Exeter, Claremont, Peterborough and Pittsfield, all of which have good-sized factories. A small amount of manufacturing is also done in the villages of Belmont, East Jaffrey, Lake Village, Wilton, Ashuelot, Milford and New Ipswich. At this latter place the first spinning mill in the state, and one of the first in the country was started in 1804, and a second one was put in operation in 1807. The total number of cotton spindles running in New Hampshire in 1889 was 1,180,648 and the capital invested was over $20,000,000.

The mills in the state of Connecticut are similarly located to those in Rhode Island, that is, in towns and villages on the various rivers. There are no places that are as conspicuously prominent as Lowell, Lawrence, Fall River and New Bedford in Massachusetts, Providence, Pawtucket and Woonsocket in Rhode Island, Manchester in New Hampshire, or Lewiston in Maine. The great bulk of the manufacturing is carried on along the banks of the rivers that unite with the tidal waters of the Thames at Norwich — the Shetucket, the Yantic, the Quinebaug and other tributaries. Norwich and Willimantic are the most important places in this district. The chief concerns at Norwich are the Ponemah Mill (Taftville), operating 117,000 spindles and 2,800 looms, the Shetucket Company (Greenville), the Falls Company (Norwich Falls), and the Totokett Mills (Taftville.) There is also considerable woolen manufacturing carried on in Norwich. Willimantic has three large concerns engaged in the cotton industry, the Smithville Manufacturing Company, the Windham Cotton Manufacturing Company, and the Willimantic Linen Company, which operates 100,000 spindles, and is well-known as one of the leading manufacturers of spool cotton in the world. Other important places in these valleys are Jewett City, Danielsonville, Putnam and Grosvenor Dale, while in a second class are Central Village, Moosup, Wauregan, Johnstown, Griswold, Wilmington, Woodstock, Killingly and East Killingly, Ballouville, Glasgo, where the works of the Glasgo Yarn Company are located, and a number of other places. Providence is the business centre for many of the mills in this region, particularly those in the Quinebaug valley. Many of the mill offices are located at Norwich, which by its position is a local headquarters.

Jewett City was one of the first places in Connecticut at which the cotton manufacture was begun. During the middle years of the last century, the land in the neighhood and the water-privilege was owned by Elezer Jewett, who operated a saw mill, a grist mill and a fulling mill, and he sold a portion of the privilege to John Wilson, in 1781. A cotton mill was erected here in 1810 by the Jewett City Cotton Manufacturing Company, composed of John Wilson, John W. Tibbetts, L. F. Tibbetts and four others, and the company bought out the Barstow, the Rose and the old Jewett water-privilege, all that existed and were in use in the neighborhood. This enterprise was not a pronounced success. In 1823 the mill was bought by Samuel and John Slater, for the sum of $17,100. They immediately greatly improved the property, building a new and substantial dam, twenty feet in height, and conducted the manufacture with great success. In 1825, John Slater bought on his own

account the woolen mill property on the Pachaug River, three miles above Jewett City, increased the capacity of the works, made the business profitable and named the place Hopeville. He also bought out the interest of his brother Samuel in the Jewett City property in 1831, and committed the management to his son, John F., while he himself continued to live in Slatersville, R. I. John Slater died May 27, 1843. His sons, John F. and William S. continued to run the various mills at Slatersville, Jewett City and Hopeville under the style of J. & W. Slater. In March, 1845, they sold the Hopeville property, and in 1849 purchased the interest of Samuel Slater's heirs in the Slatersville estate. In 1872 the property was divided, John F., who resided at Norwich, Conn., taking the mills at Jewett City, and William S. those at Slatersville. John F. Slater a few years before his death established a fund of $1,000,000 for the education of the freedmen in the South. His son, W. A. Slater, has within a few years presented the city of Norwich with an art museum, named the Slater Memorial Hall, and his benefactions to Jewett City and Norwich amount to about half a million dollars.

Among the most important places engaged in the manufacture in other regions of Connecticut, are Middletown, New Hartford, Birmingham, Manchester, Ansonia, Bridgeport, Moodus, New Haven, New London, Rockville, Tolland, Waterbury and Windsor Locks. At Middletown the extensive works of the Russell Manufacturing Company, manufacturers of webbing, belting, hose and narrow fabrics, are situated, and here also is Wesleyan University, one of the foremost institutions of learning in the country. The total number of spindles in operation in Connecticut is considerably over a million while the capital invested is more than $20,000,000.



THE DYE-ROOM, WILLIMANTIC LINEN COMPANY.

The number of cotton spindles operated in Vermont only amounts to 62,775, the most extensive mills being those at Burlington, with 24,500 spindles. There are also fair-sized factories at North Pownal and North Bennington, and small mills at Springfield, Perkinsville and Windsor.

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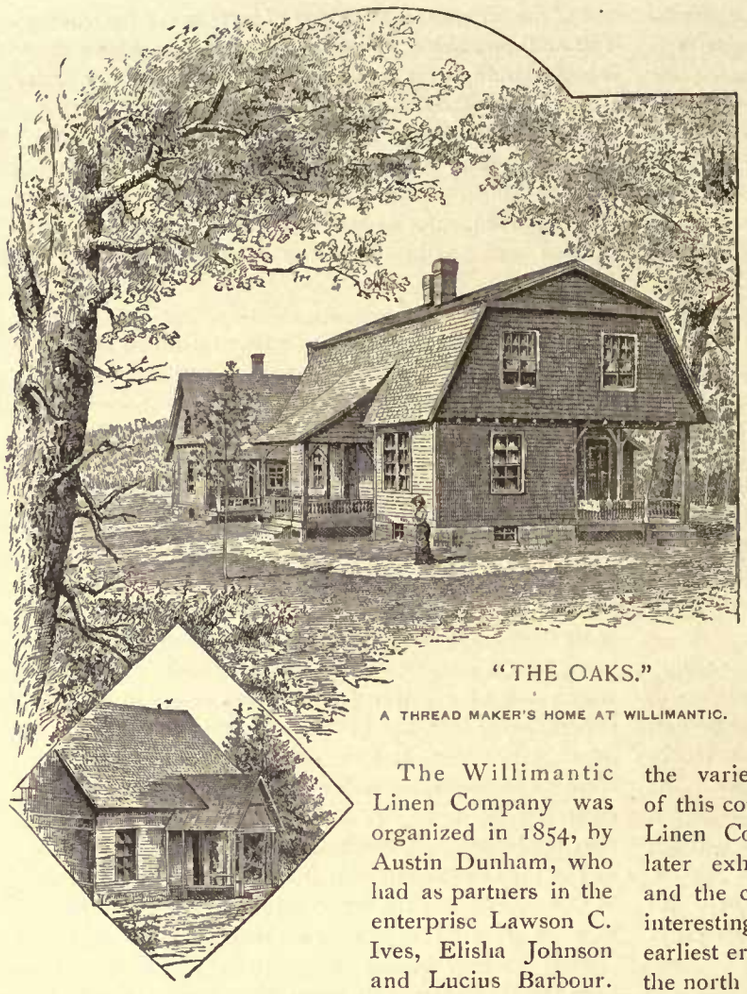
In the next few pages will be found detailed and accurate accounts of a number of the specially interesting industrial establishments in various parts of New England.

* * * * *

The large and extensive plant of the Willimantic Linen Company, in Willimantic, Conn., is not only a very important industry in that town and state, but it represents the successful competition, from the beginning of the manufacture of its thread, of American spool cotton with that made in England and Scotland. The Willimantic Company was the first to disprove the theory which was advanced in England and accepted in a large degree here, that the best cotton thread could not be made in America, and that the atmospheric conditions were unfavorable. To-day nearly all the thread used, either for domestic or manufacturing purposes, is not only made at home, but is superior to the foreign make; and in the accomplishment of this gratifying result, the Willimantic Company was the pioneer. It was the first to make all numbers of six-cord thread for the use of the sewing machine from the raw material; its methods have been largely followed by other manufacturers, and it is now the most extensive company of thread makers in America.

All this was not done without persistent devotion to a fixed purpose, to demonstrate the possibilities of American industry and American manufactures, and the overcoming of many obstacles. The English people had the advantage of cheap labor and precedence in the market, and after the Willimantic Company had made a thread for domestic use which was heartily endorsed by sewing machine people, it was not easy for the retail stores, at first, to place the cotton in the families, so great was the prejudice in favor of the foreign production. But to-day it is universally admitted that there is no thread in the market superior to that of the Willimantic; it is known everywhere, and recognized, also, as a distinctively American production. It is made on American soil and by American labor, and the company was organized, built up and controlled by American citizens, without the aid of foreign capital or assistance.



"THE OAKS."

A THREAD MAKER'S HOME AT WILLIMANTIC.

The Willimantic Linen Company was organized in 1854, by Austin Dunham, who had as partners in the enterprise Lawson C. Ives, Elisha Johnson and Lucius Barbour. Mr. Ives was senior partner of the firm of Ives, Hooker & Company, Mr. Johnson had been warden of the state prison at Weathersfield and had considerable executive experience, and Mr. Barbour had capital. Mr. Ives was president and treasurer and the official head of the corporation, but his experience had been largely mercantile, so that the personal supervision of details devolved upon Mr. Dunham, whose active experience of forty years in manufacturing industries amply qualified him for this work. He was a native of Mansfield, Conn., and at the early age of 20 years was appointed agent of the Coventry Manufacturing Company, in Coventry, Conn. Remaining here nine years, he came to Hartford, and became a partner in the firm of Peck, White & Company, afterwards conducting the business, the wholesale traffic in general merchandise and cotton, in his own name. The Willimantic Company was originally organized for the manufacture of linen goods, such as crash, toweling and shoe thread. By the failure of the supply of flax from Southern Russia, owing to the Crimean War, in 1854-55, this enterprise was interrupted, and the attention of the company was directed to the manufacture of spool cotton.

The first product of the mills was a three-cord, glazed cotton, number 60 and below. The business was profitable and developed so that the capital stock was increased to $1,000,000. In 1865, the attention of the company was directed to the production of higher numbers, which had not previously been spun in this country. Here, again, Mr. Dunham was met by the assertion that the atmosphere of Great Britain was essential to the spinning of fine numbers. He disproved this theory in the works of the Willimantic Linen Company, not by imitating the atmosphere of England and Scotland, but by the creation of an original atmosphere. The air is kept at an even temperature in each room by steam heat, and by the use of an American invention moisture is introduced in an atomized form, so that the proper humidity of the atmosphere is maintained. Spool cotton has been made as high as 200, and even higher than that for experimental purposes. The Willimantic Company has always made these numbers from the raw cotton direct: at the outset it was the only thread manufactory that did so — other mills using the fine yarn that had been imported — but the lead of this company was speedily followed by its rivals.

The first important step towards large recognition came at the Centennial Exposition at Philadelphia. Here among all the varied industries emblematical of the prosperity of this country, the exhibition made by the Willimantic Linen Company carried off the highest honors. At later exhibitions similar results have been obtained, and the cabinet of medals already secured is in itself an interesting exhibit. The four granite mills that were earliest erected by this company are picturesquely set on the north bank of the river that runs through the town of Willimantic, and are very near its centre. They extend over a space of three-quarters of a mile, and the stone of which they are built was quarried out of the ground where they stand. But the acme of development is found in the new mill, called No. 4, which was erected in 1881. This is a single story building, 820 feet long and 174 feet wide, acknowledged to be the model cotton mill in the world. Here every thing that can contribute to the best results in the manufacture of the thread, and the comfort and health of the employes, has been provided for. The three engines are set in the basement, the entire machinery for making the thread is on a single floor, moved by belts which come up from the shaft below, out of sight and out of the way, and windows comprise a large part of the walls and roof, so that light and ventilation are perfect. Plants grow on the window-sills, giving to the room not only an æsthetic appearance, but supplying the atmosphere with a moisture that must, in other mills, be artificially produced. In this mill, particularly, neatness and system everywhere prevail — the employes wear white aprons at their work, and each person is assigned a place in one of the large cloak rooms where she hangs her cloak and hat on entering, and her mill apron on leaving the mill. Throughout all the mills there is the same care manifested for the welfare of the laborers, a large number of light and cheerful dwellings have been built at the rear of the large mill, for occupation by the employes, and the result is a thrifty settlement

—a credit to the company and to the town of Willimantic. Recognizing the need of intelligence in the employes, a free school was at first opened by the company, and after giving due notice, it was announced that no person unable to read and write would be given employment. Thus the company not only secures intelligent employes, but compels them to lay the foundation for useful and honorable lives. The company has also established a free reading room and a library of over two thousand volumes, whose privileges the operatives enjoy and appreciate.

Sea Island cotton is used entirely in the manufacture of Willimantic thread. This staple is much finer and longer than the cotton in Georgia or Texas, and can be raised only on the Carolina coast islands. Its supply is limited, and it is more expensive than other cotton, and to this fact, and the care exercised in the production, is due the superiority of the Willimantic cotton. Tests are made in the different processes before the thread is completed, and every effort is made to make the strand of yarn so uniform that any number of yards taken at random will be exactly alike in size and weight. After the thread is made, each skein is carefully inspected, independent of all the previous tests that have been made, and if the slightest flaw is discovered it is thrown out. Passing this scrutiny the thread is washed and bleached or dyed. This and the drying having been accomplished, it is ready for spooling. Here automatic machinery is used wherever it is possible. The winding machine which puts the warranted number of yards upon each spool is automatic; so also is the machine for labeling the spools. One girl supplies the machine with the printed labels, while another feeds it with spools; it does all the rest for itself and at a speed of one hundred spools per minute. The spools for this thread are made in Piscataquis County, Maine, where the company has erected a saw mill, blocking and spooling mill, dry-houses, store and dwellings, and has created a junior Willimantic whose post-office is in the company's own store. Five thousand cords of birch are used each year for the spools, by a machine which makes spools of every size and kind desired. Here, also, are made the packing boxes, for which over a million feet of pine and poplar are required. Large quantities of the thread, for manufacturing as well as domestic purposes, are put up on spools exceeding the original two hundred yard size, and over two thousand operatives are given employment in the mills at Willimantic.

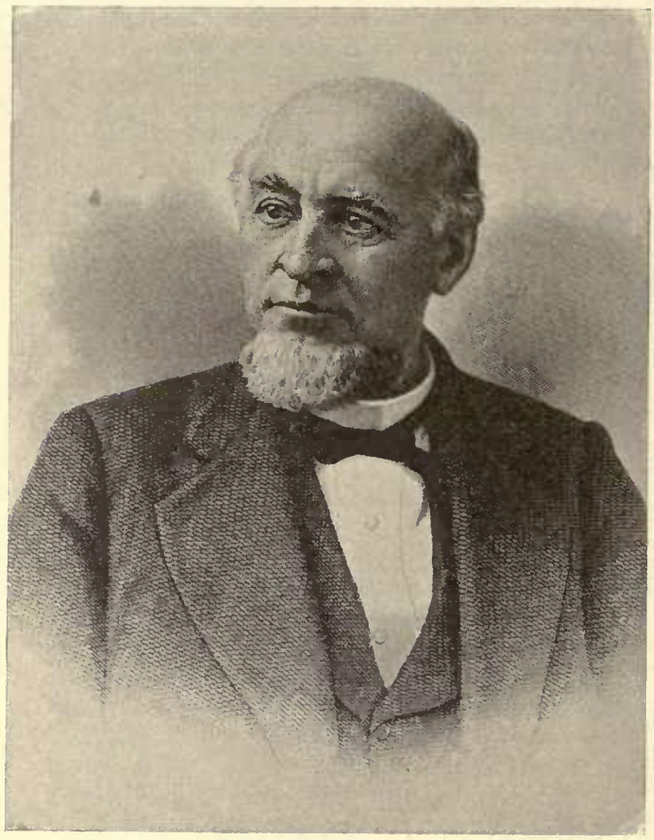
THE WILLIMANTIC LINEN CO.'S BUILDING.

1, DUNHAM HALL, (THE LIBRARY); 2, TO THE LIBRARY; 3, "MODERN GOTHIC"; 4, DECORATIVE ART.

* * *

The Pairpoint Manufacturing Company is one of the industries established within a decade which has contributed largely to the present prosperity of New Bedford. Its business, the manufacture of silver plated ware, began in 1880 in a small building 120 x 40, on the site of the present location. A building 116 x 30, three stories high, followed; later a four-story building 338 feet long, and during the past year another building has been erected, this also being four stories high, for the purpose of obtaining larger facilities for the manufacture of its flat ware.

The manufactory of the company is situated on the east side of Prospect Street, south of Howland, and the goods manufactured are silver plated articles of all kinds, for household use, as well as for ornament, including knives, forks and spoons, pitchers, casters, cake baskets, jewel cases, and the almost endless variety of table ware for use in the family. The demand for such goods has



LUCIUS BRIGGS,

MANAGER GLASGO LACE THREAD COMPANY.

increased largely within a few years, the novel and unique designs and superior quality and finish making them very marketable. There are older establishments in this branch of industry, but the Pairpoint Company yields to none of these in the quality of goods or variety of styles manufactured. Having been established within ten years, the company has been enabled to fit up its works with the latest improvements in machinery for the different processes in the manufacture of its silver ware, its facilities are second to none in the country, and there is scarcely an inch of unoccupied space in the factory. Goods are sold in all parts of the world, and the packing room has been, the past year, the busiest corner of the establishment. A large stock of goods is carried in a branch house in Chicago, as well as in San Francisco, and a fine line of samples is shown at Sidney, Australia.

Skilled and competent workmen are required in this industry. The metal which forms the basis for the silver ware is mixed and made in the establishment, and is composed largely of antimony and tin. After being rolled into sheets it is pressed into different forms and these are embossed or stamped by hydraulic presses. the largest of which has a pressure of 663 tons to the square inch, and another 350 tons. Most of the shapes required are formed by the use of dies, which are made here, and the aid of these hydraulic presses. The different parts of the ware are soldered together, and the use of the lathe is required for the shaping of many of the forms. New designs are being constantly added, some of them requiring new machinery. One such for the making of the cap for a pepper box has recently been patented by this firm. The plating of the metal base, in which five electric dynamos are brought into use, and the polishing, burnishing and designing is done by different workmen, the process being long and intricate before the product is in the beautiful and artistic shape in which it is placed on the counters of our large retail stores. The company has a machine shop of its own, where the dies are manufactured and where repairs are made. The engraving room is one of the largest in the buildings—at an elevation where there is a view of one of the finest harbors on that coast, and lately this room has been taxed to its utmost capacity. The company carries a large stock of imported glass ware, used in connection with the silver plate for the completion of many of the articles manufactured, and the plush boxes in which are placed many of the fancy articles for the holiday trade are made in the establishment. A large steam plant furnishes power; about four hundred people find employment, a small proportion of whom are females. The officers of the company are Edward D. Mandell, president, and Thomas A. Tripp, treasurer and general manager.

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Lucius Briggs, who is the present manager and half owner in the Glasgo Yarn Company, of Glasgo, Conn., has been connected with that company since 1883. Yet this does not represent Mr. Briggs' life of usefulness, which was directly connected with the development of one of the largest manufacturing establishments in Connecticut — the Grosvenor-Dale Company. He was the author of all the plans for the enlargement and improvement of the property of this company, purchasing all the machinery and materials and making the contracts for the erection of the mills, warehouses and tenements. His entire time was devoted to the conduct of the business and the development of the property.

Mr. Briggs was born in Coventry, R. I., December 21, 1825. As soon as his age permitted, he was sent to the mill where he remained until his nineteenth year, becoming familiar with all the details of cotton manufacture. He then served a two years' apprenticeship in building cotton machinery, after which, during the two following years, he did the most of the repairing in Governor Harris' Mill. In 1849, during the gold fever, Mr. Briggs and his brother went to California, returning after two years, when he was engaged by the Masonville Company in Masonville, Thompson, Conn., to repair the machinery in the lower or wooden mill belonging to the company. Mr. Briggs anticipated only temporary employment; but he and his employers were mutually pleased, so much so that he remained to take permanent charge of the repairs in the different mills of the company. A year later he was made superintendent and local agent of the company's interests and business in the village. At that time William Mason, of Thompson, owned a majority interest in the mills, and William Grosvenor, who had married a niece of Mr. Mason, was agent. In less than a year Dr. Grosvenor had purchased Mr. Mason's interest, and with his sons soon controlled the entire property excepting one-sixteenth, which had been previously purchased by Mr. Briggs.

After Dr. Grosvenor had taken possession of this property, immediate steps were taken for the improvement of the property, as rapidly as prudence dictated. The mills and machinery, with an exception here and there, were behind the times. Two upper mills belonging to the company were made into one; and the wooden mill at the lower falls was made into tenements—giving place to a new brick structure of 20,000 spindles. In 1864, the mill and privilege at Fisherville, a short distance above Masonville, were purchased by Messrs. Grosvenor and Briggs, and its development begun. Further rights were secured, the fall of water increased and a factory capable of holding 60,000 spindles erected. This mill was put in operation in 1872, making the whole number of spindles belonging to the company 96,000. Mr. Briggs was the sole author of all the plans for these improvements and personally superintended the carrying of them out, and to his good judgment and knowledge of the needs of the business was due a large share of the success of the company. So intense was his application to the business that, in 1876, his physician ordered him abroad and in company with his daughter he spent some months in travel. On his return he remained with the Grosvenor-Dale Company until 1883, when incorporation seemed advisable. Mr. Briggs did not desire to join the corporation, and an amicable arrangement between the Grosvenors and Mr. Briggs was arrived at, and Mr. Briggs' interest was transferred.

In accordance with the tendency of New England manufacturers to diversify the product, and the natural tendency of the mind of Mr. Briggs, he patented, in 1888, a new style of thread, and this is being manufactured by the Glasgo Yarn Company, of which Mr. Briggs is the largest owner, and with which he became connected after the incorporation of the Grosvenor-Dale Company. It is designed for crocheting, knitting and all kinds of fancy work. It has peculiarities in the combination of thread and twist which make the name by which it is known, "Glasgo Twilled Lace Thread," peculiarly applicable. The twilled or beady appearance of the thread is communicated to the lace made from it to such an extent that it may be truly claimed that it is the only real lace thread manufactured. It is made in all numbers from twenty to one hundred and its use is rapidly extending.

In addition to his connection with the Glasgo Yarn Company, Mr. Briggs is a director in the Norwich Bleach and Dye Works and in the Glasgo Thread Company of Worcester, Mass. He is also a large stockholder in the Ponemah Mills, near Norwich. He has represented his state in both the Senate and House of Representatives, and for some years before leaving Grosvenor-Dale Mr. Briggs was president of the Savings Bank in Thompson.

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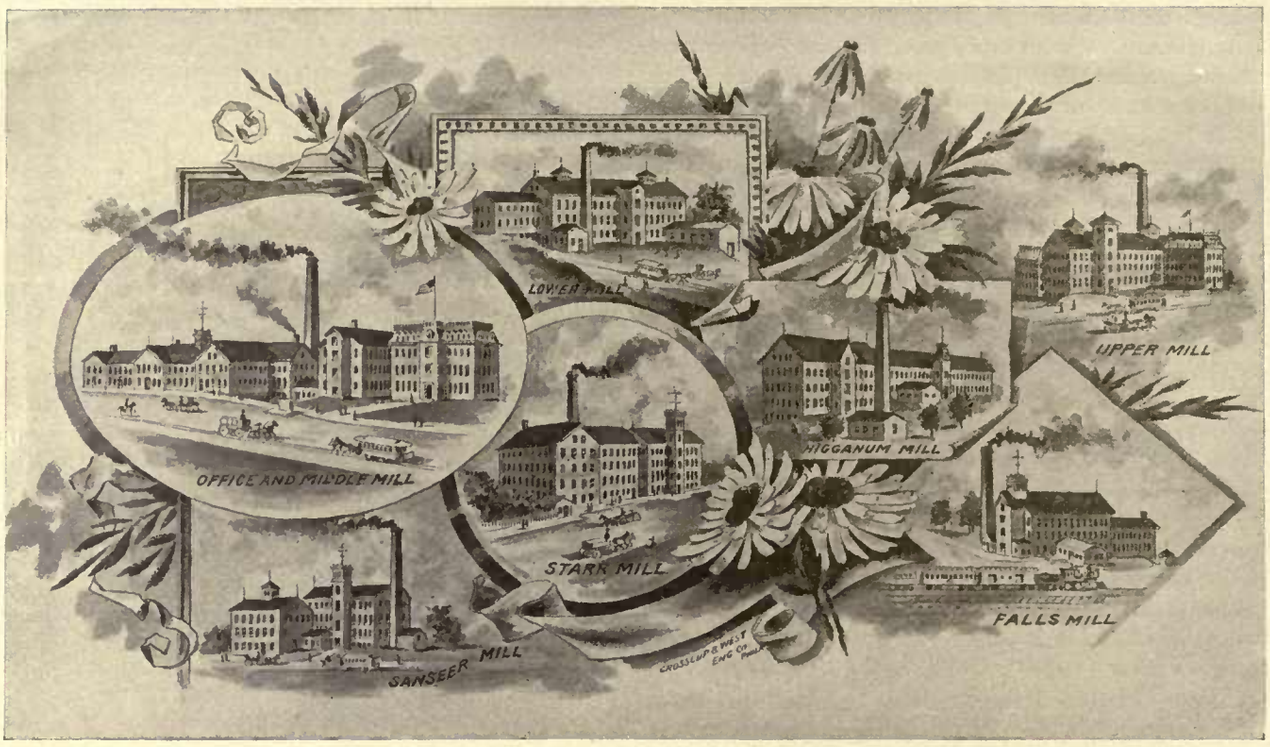
The large and prosperous manufacturing establishment of the Russell Manufacturing Company, in Middletown, Conn., is a conspicuous example of a growth from unsatisfactory beginnings to a basis of solid commercial stability, a condition that has contributed as much to the prosperity of Middletown as to the reputation of the company itself. This remarkable success is due to the perseverance and great administrative abilities of Hon. Henry G. Hubbard, who assumed the management when the original company was practically insolvent, and by his energy and long continued devotion to the interests of the business, has brought the industry to its present condition—where in certain lines it has no competition, in any country, worthy the name. When the company was organized in 1834, the plant of the corporation was confined to a building 80x30, three stories high, and the only product of the works was non-elastic web and suspenders. To-day there are seven large mills in active operation at South Farms, in Middletown, and vicinity—three devoted to spinning and four to weaving. Elastic and non-elastic webbing is woven in almost every variety and pattern and the products of the mills comprise cotton yarn, girth, rein, halter slipper and match webs, web halters and surcingles, seamless cotton and woolen hose, for fire engines and mill purposes, patent cotton belting and cotton back-banding, elastic webs and suspenders, cotton boot, gaiter and stay webs, cotton and worsted blanket binding, spindle banding, tennis and base ball belting in silk, cotton and worsted, and a variety of other articles. The manufacture of silk ribbons has also recently been begun, and it promises to be an important branch of the industry.

In 1834 the Russell Manufacturing Company was organized, Hon. Samuel D. Hubbard, an uncle of the present president, and Samuel Russell controlling nine-tenths of the stock. Mr. Hubbard owned the water-

HENRY G. HUBBARD,

PRESIDENT RUSSELL MANUFACTURING COMPANY.



WORKS OF THE RUSSELL MANUFACTURING COMPANY, MIDDLETOWN, CONN.

privilege and Mr. Russell erected the building, and here was put the machinery and material taken in settlement of the insolvent estate of Spaulding & Collis, who had been manufacturing non-elastic web and suspenders on a small scale, and unsuccessfully, as it proved. After the business had been carried on a short time, and the company found itself $20,000 in debt, a proposition was made to Mr. Henry G. Hubbard, then a young man who had just attained his majority, to take the management of the affairs. Mr. Hubbard was born in Middletown, October 8, 1814, and after an education which included one year in Wesleyan University, and an experience of a few years in a commission establishment, he went into partnership, at the age of 19, with Jesse G. Baldwin as manufacturers and dealers in fancy and dry goods. This continued for two years, when he went to Chicago for a few weeks, returned to Middletown and took the position as manager of the Russell Manufacturing Company, January 23, 1837. Just prior to this, Mr. Hubbard's father had purchased a note of Samuel Russell, given without consideration, and which the latter objected to, but offered to give the elder Mr. Hubbard stock in the Russell company to that amount, and this was accepted. After Mr. Hubbard had assumed the management of the company he purchased this stock of his father, so great was his faith in the future prospects of the plant. That year a great financial revulsion took place, and the young manager improved the opportunity afforded by a light business to master all the details of the manufacturing. At that time the company employed only thirty-five operatives and had twelve looms at work. In 1841, Mr. Hubbard resolved to begin the manufacture of elastic suspenders, and elastic webs. He ascertained that a Scotchman named George Eliot, was employed in a factory in New Britain, making elastic webs on a hand-loom, a single strip at a time. Thither Mr. Hubbard went—purchased the property and employed Eliot — and at once set about improving the methods, substituting heated calender rolls for hot flat-irons to contract the web, and succeeded in the weaving of this web on power-looms. The business was placed on a firm basis, and in the manufacture of elastic webs and suspenders Mr. Hubbard was certainly the pioneer in this country. New improvements have been constantly introduced into the factory. In 1850, Lewis Hope came from England to Paterson, N. J., and engaged in the manufacture of India rubber thread. Mr. Hubbard examined the machinery, saw that it was adapted to produce superior thread at less cost than his own and utilize the clippings at the same time. He therefore purchased the machinery, removed it to Middletown and engaged the services of Hope, and his operatives. In this way, and by his own inventions, he has kept pace with every improvement, and while the manufacture of elastic suspenders is an important branch of the industry — so important that over five thousand dozen per week are manufactured — other and various kinds of webbing as have been alluded to, are made here.

In the several mills there are now employed about one thousand operatives, the machinery used is of the most expensive kind, and ample accommodations are made for the comfort and convenience of the employes. Both steam and water-power are used, including nine steam engines, seven water-wheels and sixteen boilers. The spinning mills consume over three thousand bales of cotton per year, producing not less than one million five hundred thousand pounds of double and twisted yarn. From

time to time the capital of the company has been increased, and it is now $600,000, made entirely from the profits of the business. In 1850, Mr. Hubbard purchased the stock of Samuel D. Hubbard, and later that of Mr. Russell, so that at the present time he is the largest owner. The present officers of the company are Henry G. Hubbard president, E. K. Hubbard, vice-president, H. W. Hubbard, secretary, E. H. Burr, treasurer. Mr. E. L. Bailey is the agent, and the offices in New York are at 74 and 76 Worth Street.

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THE THOMSON-HOUSTON MOTOR COMPANY'S SYSTEM OF ELECTRIC TRAMWAYS FOR MILLS.—The introduction of electric power for commercial use dates back but a few years, but its economy and convenience have been so promptly recognized that the stationary electric motor is now to be found in nearly every city of the country. Naturally following the success of simple applications of electric power, attention has been directed to other adaptations, the extreme flexibility of the system rendering the problems presented comparatively easy.

The demand of mills and factories for a convenient method of transporting raw materials and manufactured goods, coal or other commodities from one part of the works to another, or to and from the nearest steam railway station, was one of the first to receive attention. The conditions demand a system which shall combine reliability, safety and economy; and electricity fully meets the requirements. Where a locomotive is wanted for both outdoor and interior use, a steam engine is out of the question and electric power is often preferable also, where the entire circuit is out of doors. The expense per horse-power of running a steam locomotive, and in fact any small isolated steam plant, in comparison with a large stationary engine where all the advantages of concentration are available, shows decided economy in favor of the large plant. Electricity furnishes a means for transmission of power with minimum loss and cost, permitting the concentration of the generating plant, whether steam or water-power, and the electric tramway system, in which advantage is taken of this, appeals strongly to the business man on the ground of economy.

The Thomson-Houston Motor Company desires to call attention to several installations of mill tramways, one of which is herewith illustrated, and to give detailed information concerning the system and its operation.

The plant required for ordinary mill tramway work and the operation of the system will be briefly described. The starting point of the electric system is the generator, which may be belted direct to the main driving shaft of the mill or factory, or connected with a counter shaft for proper adjustment of speed. The electric current here generated passes along an overhead wire suspended above the tramway. The motor-car is provided with a trolley arm which is always in contact with the overhead wire. The current is led by the trolley arm and its connections to the motor under the car. After performing its work in driving the motor, the current returns to the generator through the rails and copper connectors.

A series of gears transmits the rotary movement of the motor armature to the driving wheels of the car. The generator and motor are thus seen to be simply the instruments for putting mechanical power in such form that it may be carried along a wire and then re-transformed into mechanical energy at any point.

THE THOMSON-HOUSTON TRAMWAY AT WASHINGTON MILLS, LAWRENCE, MASS.

The overhead wire may be tapped anywhere and a stationary motor, an electric hoist, pump, or any form of electric power machine operated therefrom, thus giving the benefits of a regular power circuit. The overhead wire construction has been found perfectly safe in actual practice, and free from objectionable features. In cases where track has already been laid it can generally be used without material change. Any guage from eighteen inches upward may be used. The motor-car is so con-

B. F. STURTEVANT,

FOUNDER OF THE B. F. STURTEVANT COMPANY.

structed as to have nearly the carrying capacity of a similar platform car, and may be used by itself alone, or to draw a train of one or more cars. It can be equipped with a hoisting motor and derrick operated independent of the driving motor, for handling heavy iron, stone, etc., if desired. The controlling devices are extremely simple and so placed that one man operates the train with entire control of direction and speed. The motors are reversible, may be run at any desired speed, and are provided with carbon brushes, reducing running expenses to a minimum. Ordinary grades and curves offer no serious obstacles, as a glance at the description of installations will show. The man in charge of the system need have no previous training either in steam or electricity.

The current employed is of a low pressure or voltage which is fixed at a point not dangerous to human life in case of accidental contact. Wherever necessary or advisable, in the construction of the line, extra insulation is used and guard wires strung, entirely obviating danger of fire. The trolley arm is also carefully insulated.

Among the larger installations of mill tramways is that at the Washington Mills in Lawrence, Massachusetts. The illustration shows the car while making one of its trips in the yard. In this case the tramway is used entirely for coal transportation. The motor-car is provided with one three horse-power Thomson-Houston Motor, and is capable of hauling a load of 5,000 pounds, at a rate of six miles per hour. Reference is made to Mr. J. H. Jealous, agent of the Washington Mills, for information on the working of this installation.

One of the first mill tramways equipped with Thomson-Houston Motors was at the Tremont and Suffolk Mills, Lowell, Massachusetts. The entire length of track is about eight hundred feet with a three per cent. grade. The car run from one building over a bridge and the entire length of another building, a load of about four tons being carried. The overhead single wire construction is used, the current returning through the rails and connectors. Mr. E. W. Thomas, agent of the Tremont and Suffolk Company, may be referred to for facts and figures relating to the working of the tramway in his mills.

* * * * *

The development of the fan blower in its many applications, is a feature of the mechanical progress of the last thirty years. About 1860, the late B. F. Sturtevant the pioneer in this business, and by far the largest manufacturer, constructed his first fan blower. At that time, Mr. Sturtevant, having just come to Boston from his birth-place in Maine, where he had learned the trade of a shoemaker, was inventing and experimenting upon a machine for pegging shoes. This experience revealed the necessity of, and led him to invent and place upon the market, a type of small fan blower, for removing, by exhaustion, the fine leather dust and clippings from shoe buffing machines. The call for these fans rapidly increasing, he established a small shop in Boston where seven or eight men were employed.

The utility of the fan blower was readily appreciated, and as readily applied for the removal of light refuse material from all classes of machines, to the ventilation of apartments, and to the blowing of boiler, forge and cupola fires. In the latter cases particularly, it rapidly superseded the cumbersome positive blast blowers, so called.

In 1866, Mr. Sturtevant received the order for the large ventilating fans for the United States Capitol, and built what were then the largest encased fans in the country. The subsequent construction of a fan wheel sixteen feet in diameter for the Danvers Insane Asylum, was at that time looked upon as a remarkable piece of work.

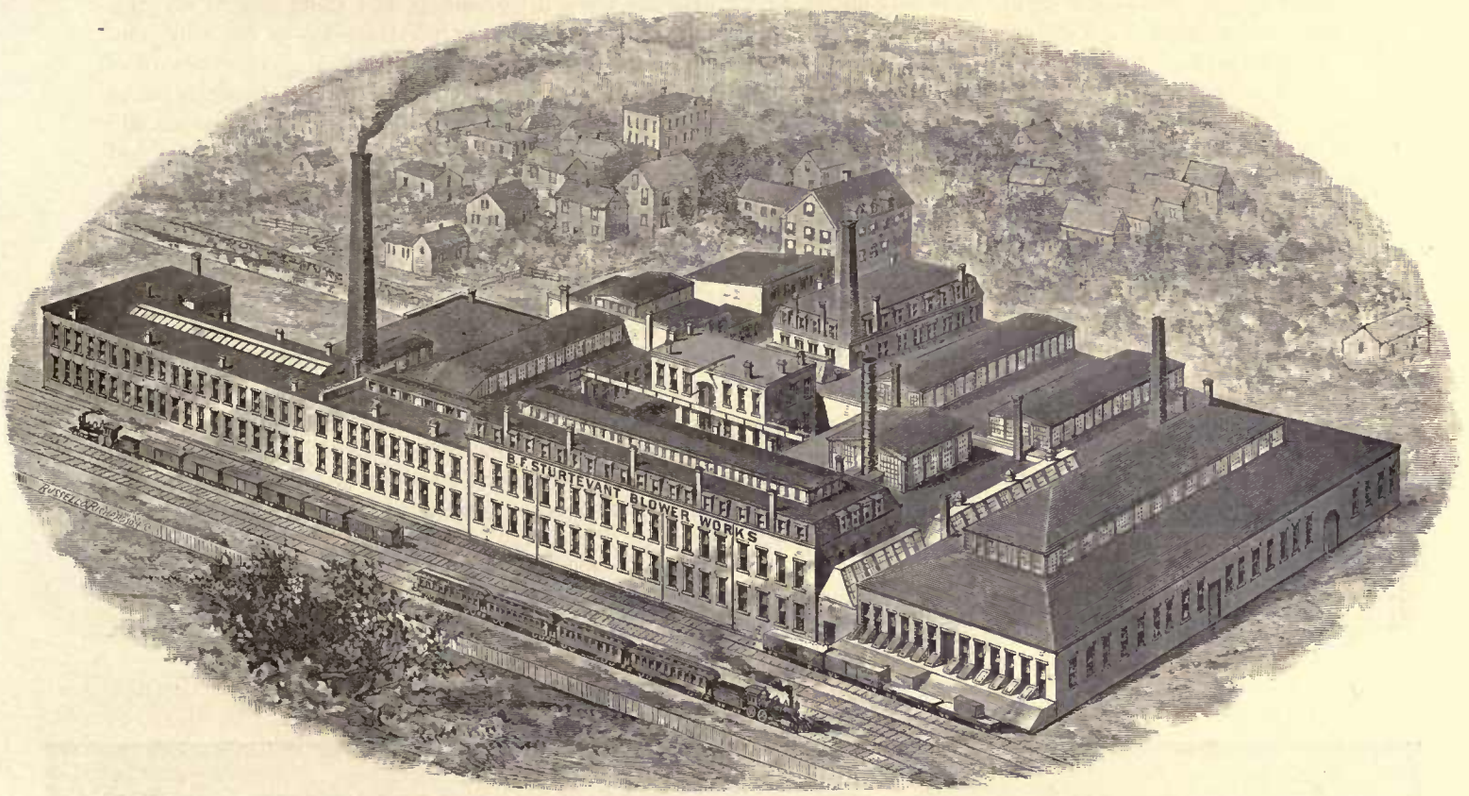
Being one of those men, who is never contented until he is fully master of all matters pertaining to his business, Mr. Sturtevant made during this period his extensive and widely known experiments upon the efficiency and capacity of fan blowers. Few men would ever have carried out to such perfection, experiments entirely at their own expense. But the time and money thus expended has been repaid a thousand times in the success which has attended the introduction of the Sturtevant Fans. Constructed upon scientific principles, and fully tested by untiring experiments they have proved themselves invaluable in almost all lines of trade. The results of these experiments were given to the public in a series of elaborate catalogues containing many tables of great utility.

The lack of room and inconvenience of a city shop finally compelled in the spring of 1878 the removal of the entire plant to Jamaica Plain, some three miles outside the city proper. Here extensive and convenient shops were erected, and additions gradually made until they form at present by far the most extensive works in the world devoted to the manufacture of fan blowers. The accompanying cut clearly shows the comparative size and arrangement of this extensive plant. The buildings are all of brick, of one, two and three stories, according to the class of work. All are generously supplied with light and fresh air and contain all the modern improve-

ments, conducive to the welfare of the employees and the production of the best work.

Passing in at the office door, which is directly across the tracks from the Jamaica Plain Station of the Boston & Providence Railroad, two commodious offices are entered, while directly overhead is the draughting room, having accommodations for twelve to fifteen draughtsmen. Passing out from the offices, one enters, upon the first floor, the engine shop, where are built all the engines required for driving the Sturtevant Fans, as well as the high grade Sturtevant Automatic Engines, both upright and horizontal. The second floor, immediately above the engine shop is given up to engine work and the manufacture of small shafts and boxes, brass work, etc.

In the centre of the building adjoining the engine shop



PLANT OF THE B. F STURTEVANT COMPANY, BOSTON, MASS.

is the boiler plant, and near by a Sturtevant Automatic Engine furnishes power for the shops. The next room entered is devoted entirely to the manufacture of the Sturtevant Heaters, which are used in connection with the fans for heating and drying purposes. Enormous heaters are conveniently and readily constructed upon the sectional plan, in fact a single heater recently shipped, contained about five miles of 1″ pipe. Immediately over this room, on the second floor, is located the fan housing shop, where all the steel plate fan housings are constructed. Above this in turn is a large room devoted to the construction of fan wheels of all sizes, and shapes, and for all uses. In the centre of the building, above the boiler and engine rooms, is the pattern shop of ample dimensions.

All of the brass and iron castings required in this establishment, are made within its walls, and the highest quality is always maintained. As the shops run parallel to and near the tracks of the Providence Railroad, the general supplies have to be simply transferred from the cars to the buildings. Special bins are arranged so that coal, iron, moulding sand, materials of manufacture, etc., can be unloaded directly from the cars. The entire length of the works facing upon the tracks is about five hundred feet. The pickling room, paint shop, erecting shop, pattern storage rooms, sheet iron and tin pipe shop, shipping room and stables occupy a large space at the back of the main building midway of its length. The establishment now has over five acres of available floor space, and employs about four hundred men in the various departments. The principal shops are lighted by electric light, the dynamos being driven by a Sturtevant Engine.

Mr. Sturtevant's personality is every-where evident in designs and unique arrangements, his whole attention having been devoted to that all-important branch, the constructive details of the business.

Although the field for the introduction and use of the various articles manufactured by this company is world-wide, yet their utility in the textile mill is such as to make them well known to mill men. Among the earlier applications was that of the exhausting fan for handling wool, hair, etc., carrying and depositing the same in bins or elsewhere, as desired. In connection therewith came the application of the fan for the ventilation of the weave and similar hot rooms.

Mr. Sturtevant early recognized the peculiar merits of

drying and heating by a forced circulation of warm air. He combined the fan with a special steam heater, and at first introduced it for the drying of cotton, wool, hair, yarn, etc., but its success in this line rapidly drew attention to its desirability as a means of heating. The type of fan was changed, it was designed particularly for the handling of large volumes of air at a minimum expenditure of power, the wheel and shell being constructed of steel plate, very light, but strong. The heater is of special construction, being made up of sections of cast iron, into which are screwed upright pipes of steel, connected above by cross pipes so as to secure thorough circulation throughout the heater. The entire heater is encased in a steel plate jacket, connecting with the fan.

By means of the fan a very large volume of air is caused to pass across the pipes, thereby causing very rapid condensation of the steam within. In fact the condensation and consequent radiation of heat is so great that one foot of pipe in one of these heaters is capable of doing as much heating as three or four feet of pipe strung around the room in the ordinary manner.

The past few years has witnessed a very general introduction of this type of apparatus in the textile mills of this country. In fact, with only a few exceptions, every new mill of this class erected in New England during the year 1890 has been supplied with this heating system, To secure its proper introduction, the system should be decided upon before the building is erected, so that the mill architect and engineer can make proper provision for it.

The Sturtevant System now accomplishes a triple purpose—that of heating, ventilating and moistening. These three are always interdependent, so that a change in the efficiency with which one is accomplished, must of necessity affect the remainder. This system contemplates massing the steam pipe in coils located in the basement, or in a building adjacent to the mill, and taking from out of doors the fresh air to be heated, and passing it, by means of the fan, across the heater pipes, thus distributing it about the building by means of ducts built in the walls.

As a rule the fan is located midway of the length of the building, and discharges the air into a duct running along one side of the mill, and formed in part by the ground or floor and the mill wall. This duct is generally of brick, occupying no valuable space, and serving as a ready conduit for the air.

At intervals along the mill wall are vertical flues running up between the windows in the form of hollow pilasters. These are usually placed some fifty to seventy-five feet apart, and deliver their air to the mill from openings some ten feet above the floor. The velocity of discharge and rapid motion of belting and pulleys serves to thoroughly distribute this air, efficiently heating and ventilating everything in its course. Mills up to 120 feet wide, have been equally heated in this manner by flues and openings on one side of the mill only.

It is now an accepted fact that the best preventative for electricity and its injurious effects is a moist atmosphere. Instead of the thousands of dollars expended for patent moisteners, the Sturtevant System simply inserts a small spray of water in the main air duct, and thereby moistens effectually all the air delivered to the mill.

The B. F. Sturtevant Company, through its large experience in this line, is qualified to lay out and design systems of heating for all classes of buildings. Branch houses have been established at Boston, New York, Chicago, Philadelphia and London.

FALL RIVER, FROM THE HARBOR.

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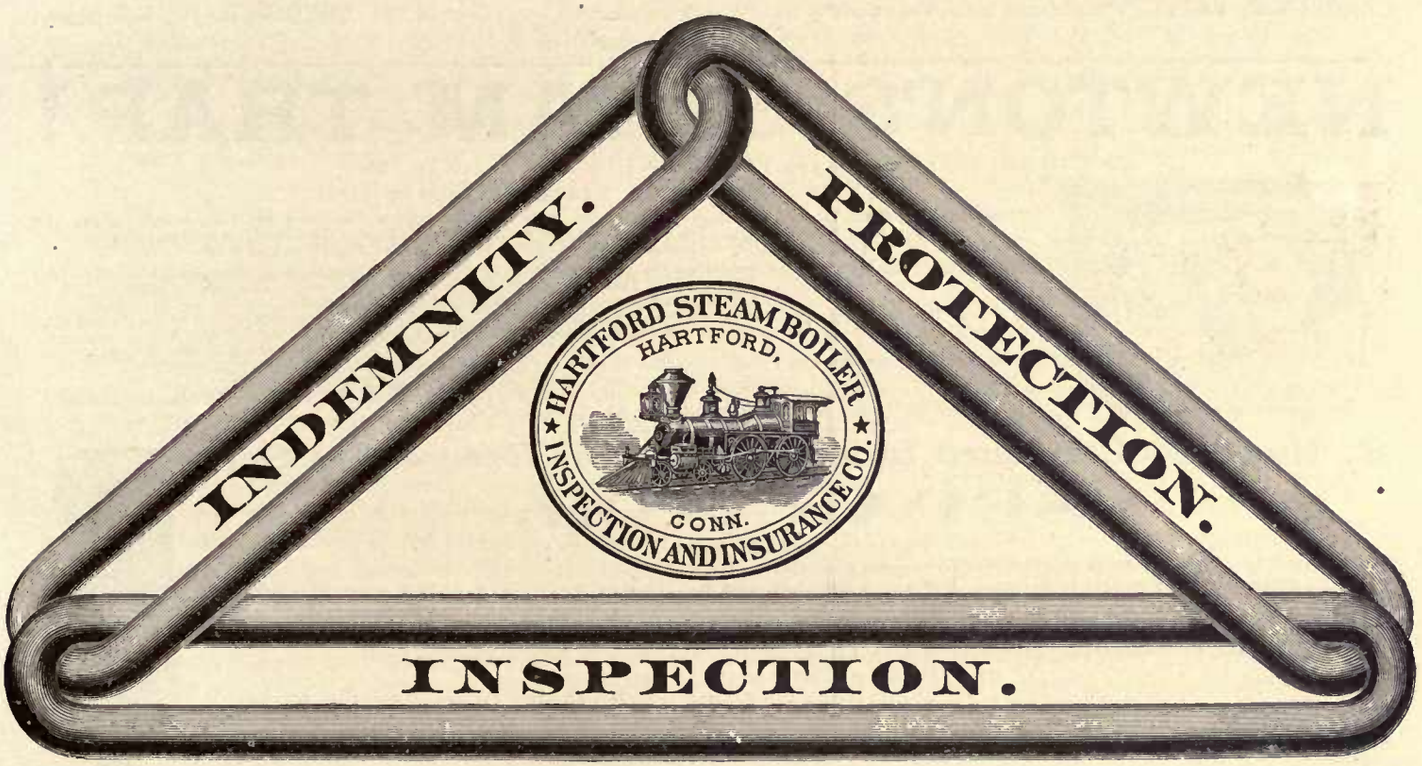

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Particular attention paid to the manufacture of Cotton Paper and Husk Rolls, for calendering either Cotton, Paper or Silk Goods. A Large Assortment of Gear, Pulley and Machinery Patterns of various kinds. Catalogues of Gears and Pulleys furnished upon application.

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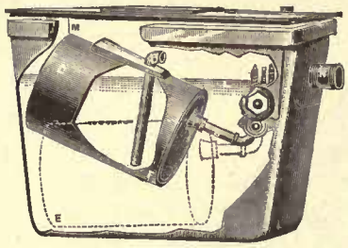
NEWTON'S STEAM TRAP!

Patented Oct. 5, 1880. Aug. 7, 1883. Sept. 4, 1883. Jan. 12, 1886.



EFFECTS A LARGE SAVING IN FUEL.

Warranted for Two Years. Perfectly Automatic. Can be seen in Operation by Removing Loose Cover. All Parts are Easily Accessible. Works Equally as well on High or Low Pressure. No Expansion or Contraction. Invaluable for Separating Water or Oil from Natural Gas.

Received the Highest Award ***at the Exhibition of the Franklin Institute of Philadelphia, Pa., for Steam Traps, 1885.*** We have sold *700* of these Steam Traps to TWENTY of the largest manufacturing concerns in the N. E. States and Pennsylvania.

Read the following statement from the well-known concern of Washburn & Moen Mfg. Co., who required a Trap guaranteed to work at 100 lbs. pressure, before giving the Newton Trap a trial.

WORCESTER, MASS., Jan. 12, 1889.

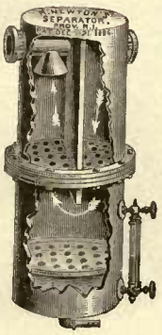
Providence Steam Trap Co., Providence, R. I.:

GENTLEMEN—Those of your steam traps which we have used have given us good satisfaction.

Yours truly. WASHBURN & MOEN MFG. CO., PHILIP W. MOEN, Ass't Treas.

The *TENTH* order has been received from the above concern.

R. Newton's Combined Steam, Water, Oil, Grease and Grit SEPARATOR.



Patented Dec. 21, 1886.

With the use of this apparatus we guarantee the following results:

Pure Dry Steam for Engines, Pumps, Etc., no matter how long may be your MAIN PIPE, or how much your BOILER MAY PRIME.

The Extraction of Oil, Grease, Grit and Water from the Exhaust Steam, so that such steam can be used for Heating, Dyeing, Bleaching, and other purposes, and when Condensed can be used over again in Boilers, if desired.

We will send one of these Separators on trial for thirty days to any responsible party.

READ THE FOLLOWING STATEMENT:

LOWELL BLEACHERY AND DYE WORKS, LOWELL, MASS., Sept. 5th, 1887.

ROBERT NEWTON, ESQ., *Dear Sir*—Replying to your favor of the 1st inst., I have to say that your Separator is giving us perfect satisfaction, and merits our unqualified approbation. Shall be happy to show it to any one wishing to investigate the operation of same at our works. Very truly yours, JAMES N. BOURNE, Agent.

The *SECOND* order for a 10-in. Separator has been recently received from the above concern.

R. NEWTON'S PATENT SEPARATOR AND STRAINER.

Simple, Cheap and Durable. Nothing to Wear Out and will Last a Life Time.

Invaluable for Steam Traps, Injectors, Boiler Feed Pipes, Water Meters, Water Elevators, Locomotives, Sugar Refineries, etc. An Arrester of Iron Chips, Scale, Red Lead, Packing, Dirt, Sand, Grit and other foreign substances that collect in the Steam and Water Pipes.

Some of the advantages to be found in this Separator and Strainer are as follows:

It is thoroughly efficient in every respect. Lower chamber is of ample capacity, causing a much slower current than there is at the inlet, thus allowing the impurities to settle to the bottom. There is no wire gauze or kindred substance to wear out.

A plug is placed at top of Separator on the outlet side, so that access may be gained to small holes in perforated plates (if ever required), without disconnecting Separator. The Separator is cast whole (no flange joint being required for perforated plate), insuring strength to the apparatus.

Send for Circulars. AGENTS WANTED. Liberal Terms to the Trade.

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Chapter X.

THE COTTON MANUFACTURE OUTSIDE OF NEW ENGLAND.

The Extent of the Industry in the Middle States — First Factories in the State of New York — Founding and Development of the City of Cohoes—Manufacture of Hosiery and Knit Goods—Other Cotton Centres in New York—First Factories in New Jersey—Newark—Paterson—Philadelphia, the Greatest Textile Centre in the Country—Wilmington, Delaware—First Mills in Maryland—Baltimore and Vicinity—Cotton in the Southern States—Early Manufacturing in the South—Development of the Cotton Industry in the South Since the War—The Industrial Exhibitions at Atlanta, Louisville and New Orleans—Small Proportions of the Industry in the West.

Next in importance to New England in the extent of the cotton manufacture comes New York, Pennsylvania, New Jersey, Maryland and Delaware, in the order named. Although they follow very far behind, having together only a total of about 1,700,000 spindles against over 11,000,000 in New England, yet some of the earliest factories in the country were established in these states, and a few of these concerns have had a similar history to their contemporaries in the east in that at present some of them have grown to large proportions.

The first cotton factory in the state of New York is said to have been established at Union Village, Washington County, by William Mowry, who had learned the business with Samuel Slater at Pawtucket, and this mill was for many years one of the largest in the country. Many cotton mills were started in New York state in 1811 and 1812; in 1823 there were in the whole state thirty-six concerns engaged in the industry, but a great increase took place in the next few years so that in 1836 there were 112 factories with a capital of $3,669,500, running 157,316 spindles, employing 12,954 hands and producing upward of 22,000,000 yards of cloth annually.

A small factory was started at Whitestone, near Utica, in 1807 or 1808, by B. S. Walcott, Jr., one of the original projectors of the Cumberland Mills, Rhode Island, and who had worked in the Old Mill at Pawtucket. This mill was the nucleus from which has grown the well-known New York Mills, whose sheetings and shirtings have been considered the standard for many years throughout the country, and were only rivaled by the products of the Wamsutta Mills in New Bedford. The present capital of the New York Mills is $1,000,000, 65,000 spindles and 1,700 looms are run, and the goods manufactured are sheetings and shirtings.

The city of Cohoes, about eight miles above Albany, has had a somewhat remarkable development as a textile manufacturing centre. When the Erie and Champlain canals were in process of construction, from 1817 to 1823, the attention of Mr. Canvass White, constructing engineer, was attracted to the great force of the Mohawk River at Cohoes Falls, just above the junction of the two canals. He originated a design for the utilization of the water-power and succeeded in interesting a number of prominent capitalists, the result being that a corporation, with this object in view, named the Cohoes Company, was incorporated in 1826. Between that time and 1830, this company built a dam above the falls, and by a canal two miles in length utilized the water of the river. By a well considered system of subsequent improvements, the power has been developed to its fullest capacity, until there are at present ten canals that furnish water to mills and shops on six different levels. The total fall is 120 feet, and 10,000 horse-power is available, although a large proportion of it is not used. A small cotton factory had been put in operation in this locality about 1817, by the Cohoes Manufacturing Company, but this mill was destroyed by fire in 1829, and was not rebuilt. Until the formation of the Cohoes Company, the place seems not to have had any distinctive name, but to have been known as the Junction, from the fact that here the Erie received the waters of the Champlain canal, by a navigable feeder from the Mohawk. Here were located seventeen locks, which still exist in an enlarged form within the present city limits, and at that time a few houses had been erected in the neighborhood for the convenience of travelers and the accommodation of the canal boatmen. David Wilkinson, being a member of the Cohoes Company, removed here from Pawtucket in 1830, and was one of the first to use the water-power. He erected a shop for the construction of machinery and had it in operation a few months after his arrival. Hezekiah Howe, Mr. Wilkinson's brother-in-law, arrived the following year and engaged in constructing some of the first canals of the Cohoes Company. A cotton mill was built in 1832, and a number of other concerns were put in operation in the next few years, but no great increase in the industry of the place occurred until in 1837 the Harmony Manufacturing Company began the erection of a large cotton factory. Through the purchase of the Strong and Ogden Mills, erected in 1846, the building of other mills and the enlargement of the original structures, this corporation has the most extensive works in one cluster in the country exclusively devoted to the manufacture of cotton goods. There are five cotton factories beside a jute and bag mill. Mill No. 3, made its present size by an extension in 1872, is the largest complete cotton factory in the country, being 1,185 feet long by 70 feet wide in the old part, and 76 feet in the extension, and has within its walls 2,600 looms and 126,000 spindles, while about 1,700 operatives are required to run this machinery. The present capacity of the Harmony Mills is 275,000 spindles and 6,200 looms.

The manufacture of knit underwear by machinery had its origin in Cohoes, and this industry is entitled to be classed in connection with cotton as, although the chief basis of knit goods is wool, yet cotton is used to a large extent in the cheaper grades. The first effective knitting machine that supplanted the old heavy hand frame was the invention of Timothy Bailey and Egbert Egberts, Mr. Bailey being the practical mechanic while Mr. Egberts furnished the funds. The result was the production of a machine that successfully performed the work. Egberts and Bailey formed a partnership and started in 1832 eight of the machines in the cotton factory that had been erected that year. They did not patent their invention, but conducted the manufacture secretly. The firm erected a mill specially designed for the business in 1843 and this was the only factory in the country for many years in which the knitting of shirts and drawers was done by machinery. After 1854, a great increase took place in the knitting business, and new mills were erected nearly every year. In 1869, there were eighteen large knitting mills, and in 1872, there were twenty, employing 2,500 hands. At present there are in Cohoes, nearly forty establishments running more than two hundred sets of cards, and the city still occupies the foremost position in this branch of the textile manufacture. Amsterdam and Little Falls approach next to Cohoes in the extent of the manufacture of knit goods, but the industry is also carried on in many other places.

Although nearly one-half of the entire amount of the cotton manufacture in the Empire State is conducted in the Harmony Mills at Cohoes, yet there are several other places that are important centres. Utica has three large companies operating 83,000 spindles, while the New York Mills, and the factories in New Hartford are in the manufacturing district of which that city is the centre. At Newburgh, and Victory Mills, Saratoga, are good sized factories. The number of cotton spindles in the state in 1889 was 619,472.

A cotton mill was in operation in New Jersey at Belleville in 1809, and at the same place a large calico printing, dyeing and bleaching works was started in 1825. The county of Essex contained in 1814 twenty cotton mills running 32,500 spindles. Notwithstanding this early start, New Jersey has at present only 351,068 spindles and of these 200,000 are in the works of the Clark Thread Company, and the Clark Mile-End Spool Cotton Company at Newark, both of which establishments are in reality owned by one company. In Newark there are three other thread works but they are very small as compared with the Clark establishments. The existence of all these various concerns constitutes Newark one of the chief centres of the spool cotton industry.

Cotton was formerly the chief industry in the city of Paterson, but at present the manufacture of silk leads all others, there being over a hundred different establishments engaged in this business, many of them operating extensive mills. A considerable amount of flax is also manufactured here in six or eight establishments. At present there are only four cotton manufacturing concerns, one of which runs 40,000 spindles. The city of Paterson was founded in 1791, as a result of the exertions of Alexander Hamilton, who had been instrumental in forming an association which was incorporated by the legislature of New Jersey under the name of "The Society for the Establishment of Useful Manufactures." This association, with the intention of forming a great manufacturing city to be devoted chiefly to the manufacture of cotton cloth, selected the neighborhood of the Falls of the Passaic as the seat of operations. The Great Falls had an elevation of 140 feet and was calculated to be capable of driving 248 undershot water-wheels, while the Little Falls, four miles above, had a descent of thirty-six feet and would drive seventy-eight wheels. The society had in addition to other privileges, obtained a city charter, giving jurisdiction over a region six miles square, on which there were only about ten houses. The embryo city was named in honor of Judge William Paterson, then governor of New Jersey. At first the advancement of the place did not realize the hopes of its founders, but on account of the water-power and other natural advantages it gradually attracted industries so as to justify the wisdom of its selection. The first cotton factory, 90 x 40 feet, was begun in 1792, and finished in 1793, and yarn was spun in this mill by somewhat imperfect machinery. Calico shawls and other cotton goods were printed, the cloth probably being India muslins. In 1809 a small cotton mill was in operation at Paterson; in 1814 there were five mills; in 1822 twelve, with 17,724 spindles; in 1827 three had been added, and in 1829 there were seventeen. In 1860 the city had eleven establishments with an investment of $683,000, but since that period silk has supplanted cotton, until at present Paterson is the centre of this manufacture in the country. The only other places in New Jersey where any amount of cotton goods are manufactured are Gloucester, Millville and May's Landing, and there are a few small mills elsewhere.

The early attempts to spin cotton by machinery at Philadelphia under the patronage of Tench Coxe, Dr. Benjamin Rush and others, by means of the instrumentality of societies for the encouragement of domestic industry, has already been alluded to in the second chapter of this work. These first endeavors were only partially successful, but while failing to accomplish what Samuel Slater afterward achieved, they gave an impetus to local manufactures whose effect have continued until the present. As a result, and also probably owing to situation, to general conditions and to its position at first as the central city in the Union, Philadelphia has always been the greatest manufacturing locality in the country, and has likewise been distinguished for the diversified character of its industries, nearly every process and art in use in the country being represented in its borders.

In 1793 and the following year, eight Arkwright spinning frames and several mules were in operation in the Globe Mills, in the northern part of the city. The first calicoes in America printed from engraved cylinders were made in 1810 at the works of Thorp, Siddall & Company, six miles from Philadelphia, and were sent there to be sold. During the same year 4,423 cotton spindles were running in the city; in 1815 the industry had increased to such an extent that 2,325 persons were employed, and in 1821 there were in operation 4,000

looms, "chiefly for weaving cotton goods." In 1824 Philadelphia had upward of thirty cotton mills, averaging 1,400 spindles each, running a total of 5,000 looms, and employing 3,000 persons. The development of the textile industries in Philadelphia since 1860 is shown by the following table:

	1860.		1870.		1880.	
	No. of Estab's	Capital.	No. of Estab's	Capital.	No. of Estab's	Capital.
Cotton goods,	90	3,029,800	66	6,042,440	145	8,332,550
Hosiery, etc.,	102	847,960	72	2,871,900	95	3,042,690
Mixed textiles,	56	1,091,100	.....	.....	87	8,391,651
Carpets, . .	124	882,625	236	2,997,650	58	7,194,433
Woolens, . .	21	541,000	123	8,101,050	89	11,752,000
Worsteds, . .	2	30,500	29	3,149,600	24	4,459,639
Silk, . . .	34	918,000	10	1,429,000	47	1,313,900

In 1870 Philadelphia was the greatest manufacturing city in the country in the number of establishments, hands employed, capital invested, wages paid and value of raw materials used, but was surpassed by New York in the value of the manufactured product. This position the city has since maintained. The lines of cotton goods made, instead of being sheetings, shirtings and prints as in New England, are ginghams, checks, yarns, thread, specialties and mixed fabrics, and the manufacture is carried on by some large factories and in a multitude of smaller establishments. Taking all the various branches of the textile manufacture as a whole, Philadelphia leads he country. A few other places in Pennsylvania have a little cotton manufacturing, and the total number of cotton spindles running in the state in 1889 was 445,962.

Calico was printed in Wilmington, Delaware, as early as 1795, by a French Marquis, and about the same time a cotton mill was started by Jacob Broome. In 1860 in that city and vicinity there were eleven establishments engaged in the manufacture of cotton goods, representing an investment of $582,500, and employing over one thousand hands, and this industry was then the most important in the locality. It has not increased since then to any marked extent, as in the whole state only 61,714 spindles are in operation, most of which are in Wilmington and Newcastle.

Very early in the century the cotton manufacture was begun in the state of Maryland. A company was formed in Baltimore in 1789 to manufacture cotton on a small scale, using stock cards and small hand jennies, but although some jeans and velvets were made, the enterprise was not ultimately a success. In 1810 two mills, 110 x 44 feet, five stories high, and fitted for 10,000 spindles, were erected by the Union Manufacturing Company on the Patapsco River, ten miles from Baltimore. The first mill was started in May, and continued to run until December, 1815, when it was destroyed by fire. It contained 6,000 spindles. The second mill was started July, 1814. The Powhatan Cotton Mills were started in 1810 at Gwinn's Falls, several miles from Baltimore. In 1811 the Washington Manufacturing Company erected a mill at the James Falls, five miles from Baltimore, and began to spin cotton by water-power. A print-works that would turn out 12,000 yards a week was begun at Baltimore in 1810, and in that city and vicinity the same year there were in operation eleven cotton mills, with 9,000 spindles, and 1,500 to 2,000 more in preparation. At present Baltimore has about 100,000 cotton spindles running, and in the state in 1889 the number reported was 176,800.

The part the southern states have borne in relation to the great cotton industry has always been that of the producers of the cotton staple, and the manufacture has occupied a very subordinate place. The invention of the cotton gin in 1793, gave a great impetus to the cultivation of the cotton plant, and soon the energy and capital of the entire section was mainly devoted to this industry. From being a plant grown either for its beauty in gardens, or for use in a very small way by means of the rude machinery in existence, the cultivation increased from an annual production of less than a million pounds to more than seven million bales in 1890, or between two and three thousand times as much. This increase went on through the years, in response to the ever-increasing demand created by the improvement in methods and the continuous extension of the manufacture. At the present time there are 30,000 square miles under cotton cultivation in fourteen southern states, and in the Indian Territory. The larger part of the cotton crop has always been exported, chiefly to England. On this account, the interests of the South very early in the century induced her representatives in Congress to oppose the protective tariffs, enacted at various times, on the ground that they interfered with the free exchange of the cotton staple for the wares and goods of Europe, and so tended to restrict the field of operations, and prevent as great a development of the cultivation of cotton as would otherwise occur. On the other hand, the manufacturers of New England and the middle states clearly perceived the benefits that would result to them from a tariff. The controversies that thereby resulted gave rise to grave sectional differences, brought forth the doctrine of nullification on the part of the southern leaders, and eventually created the conditions that engendered the War of the Rebellion.

Some attempts to establish the cotton manufacture, however, were made in the South during the early years of the century. At Charlestown, S. C., the South Carolina Homespun Company was organized in 1808 with a capital of $30,000. The first cotton factory in North Carolina was erected in 1818 at the Falls of the Tar, on Pamlico River, Edgecombe County, and the second near Lincolnton, on the Catawba River. The former employed about twenty hands in 1820, and operated 148 spindles. A cotton factory was established at Petersburg, Va., in 1827, and some time afterward two large mills were built at Matoaca four miles from that city. Lexington, Kentucky, had in 1828 ten cotton factories, and ten other mills making cotton bagging, and the same year a mill was started at Covington. During 1828 several factories were started at various places in Georgia. The corner stone of a factory was laid at Athens, Ga., March 26, 1829. This mill was burned soon after it was finished, but was immediately rebuilt. In 1831 factories were running at Nashville, Tenn., and Richmond, Va., at the latter place slave labor being employed. A company was formed in Mississippi in 1832 to build a cotton mill, with the intention also of employing slaves. At Fayette-

ville, N. C., a mill containing 1,000 spindles was started July 4, 1836. During the same year two factories, each three stories high, were erected on the Appomatox River, four miles from Petersburg, Va. In 1837 there were small factories in operation in North Carolina at Greensboro, Mocksville, Haw River and Cane Creek. In 1860 in the southern states there were reported to be 158 cotton mills, operating 290,359 spindles and 6,713 looms, with an invested capital of $8,104,587. Of this number, North Carolina had thirty-eight, but Georgia, with only thirty-three mills, did considerable more manufacturing and turned out nearly one-third of the entire production.

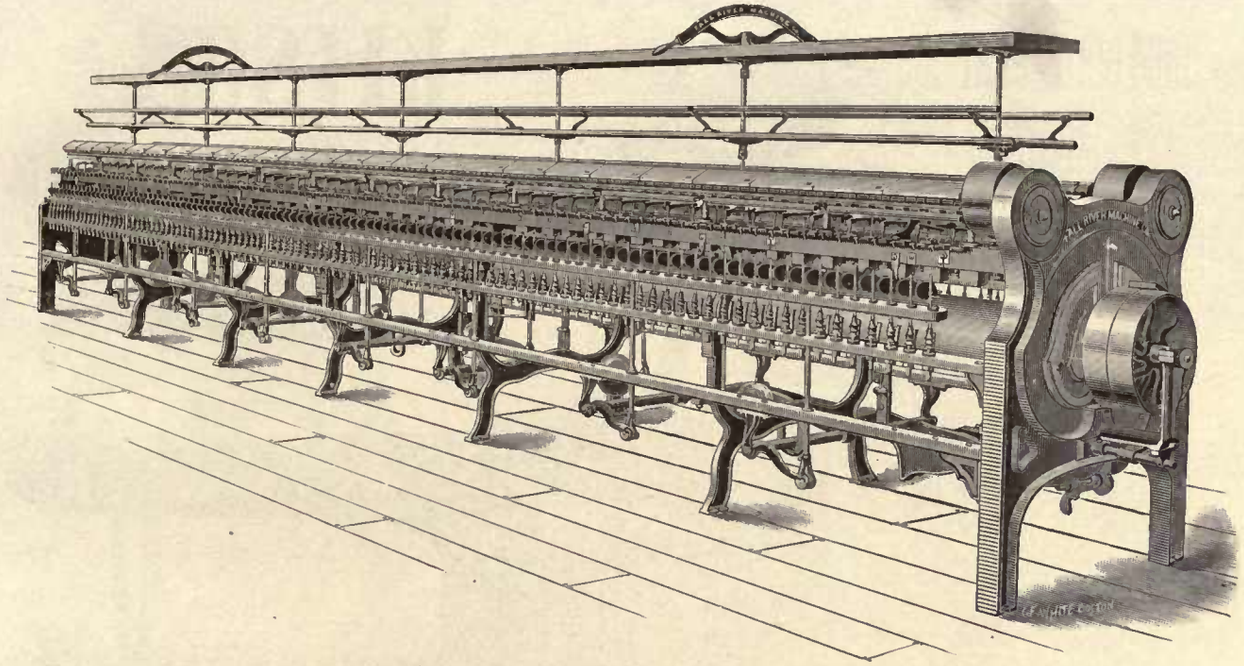
Since the war, the cotton manufacture in the South has increased to five or six times its former amount, and this increase has been much more marked within the last decade. The number of spindles reported in operation in 1889 was over 1,600,000, and many new mills were projected or in course of erection. The factories are generally small as compared with northern mills, and as yet are chiefly devoted to the making of the coarser grades of goods that will readily sell in the local or most easily accessible markets. These fabrics consist of sheetings, shirtings, drills, cottonades, osnaburgs, cotton duck, yarns, twines, etc. Georgia is in the lead, having 442,000 spindles in operation, and the chief centre is Augusta, in which city and its neighborhood there are twelve establishments. Other important places in Georgia are Atlanta, Athens and Columbus. South Carolina has 351,000 and North Carolina 321,000 spindles. The next most important state in the amount of manufacturing is Tennessee, with 116,000 spindles, nearly one-half of the business being carried on in the factories of Nashville. The remainder of the southern states all have less than 100,000 spindles each in operation.

Within the past decade the development of the cotton industry has been materially aided in the South by the expositions held at Atlanta, Ga., New Orleans, and Louisville, Ky. In a letter to the New York *Herald* in the autumn of 1880, Edward Atkinson called attention to defects in existing modes of picking, ginning, cleaning and the general preparation of raw cotton for market, and made the suggestion that an exhibition be held at some central point in the South during the ensuing year for the purpose of bringing together those interested in the production of the cotton staple and in the manufacture of cotton goods. As a result of this suggestion, an organization was formed composed of both northern and southern men, and was chartered April, 1881, under the name of the International Cotton Exposition, with a capital of $200,000. The Exposition was opened at Atlanta, Ga., October 5, 1881, the buildings being located in Oglethorpe Park, two miles from the centre of the city. Cotton machinery, and all descriptions of cotton fibres, products and fabrics, as well as other textiles, were on exhibition in great profusion, and the great and varied resources of the South were well illustrated. For a period of eighty-six days the Exposition was open, being closed December 31; there were upward of 1,800 exhibitors and 286,895 visitors, and the enterprise was a success financially. It helped very largely to accelerate manufacturing throughout the South, and in a more direct way assisted in the growth of Atlanta, as between 1876 and 1886, that city increased in population from 21,789 to over 60,000. The exposition buildings were converted into factories, in 1882, and are now operated under the name of "The Exposition Cotton Mills."

At Louisville, Ky., the Southern Exhibition was opened August 1, 1883, and continued open 100 days. It was mainly a display of the various cotton fibres and of the methods of cultivation, ginning, cleaning and other processes connected with the production of the staple, and was in a great measure local to the South.

Such was the success of the Atlanta Exposition that a desire was created to have a more extensive exhibition, and one that would also partake of the character of a centennial of the culture and manufacture of cotton. As a foundation for this feature the claim was made that the first record of cotton as an article of foreign export from the United States was the shipment in 1784 of six bags, from Charleston, S. C. In October, 1882, the National Cotton Planters Association voted to hold such an exposition during 1884 in New Orleans, and February 10, 1883, Congress passed an act incorporating "The World's Industrial and Cotton Centennial Exposition." A loan of $1,000,000 was made by the United States Government, and the total capital raised was nearly $2,000,000. The Exposition was opened December 16, 1884, and closed May 31, 1885. The main building covered thirty-three acres — 1,656,030 feet — and was the largest ever used for exhibition purposes, being 1,378 feet in length and 905 feet wide, while there were many other edifices some of which were mammoth structures. These buildings were all located in Upper City Park, on the banks of Mississippi River, four and a half miles from the centre of the city. The main building was devoted to general exhibits, foreign displays and machinery. All phases of the cotton manufacture were elaborately presented by the latest improved machinery, and the processes of treating raw cotton, sugar cane and rice, the great staples of the South, were thoroughly exhibited. Extensive exhibits were on hand from nearly all American countries, Mexico being especially well represented, but the products of the southern states in infinite variety formed the chief feature, and elaboration illustrations of the culture of cotton were given. Many European countries had extensive exhibits. While not a financial success as far as paying all expenses, the Exposition more than repaid the South for all outlays in the great improvements in method and in the wide-spread instruction that resulted through its agency.

Very little cotton manufacturing is done in any of the states west of the Atlantic seaboard, the total number of spindles in all this great country from Ohio to California being less than in some small Eastern villages, and not so great as in a number of the great corporations. Indiana had in 1889, 61,868 spindles, while Ohio, Illinois and Wisconsin had each a few over 25,000, and Iowa had less than 10,000. Michigan, California and Utah reported one small establishment each, and the remaining states had no cotton manufacturing. The factories, too, in this section are small and work on coarse goods.



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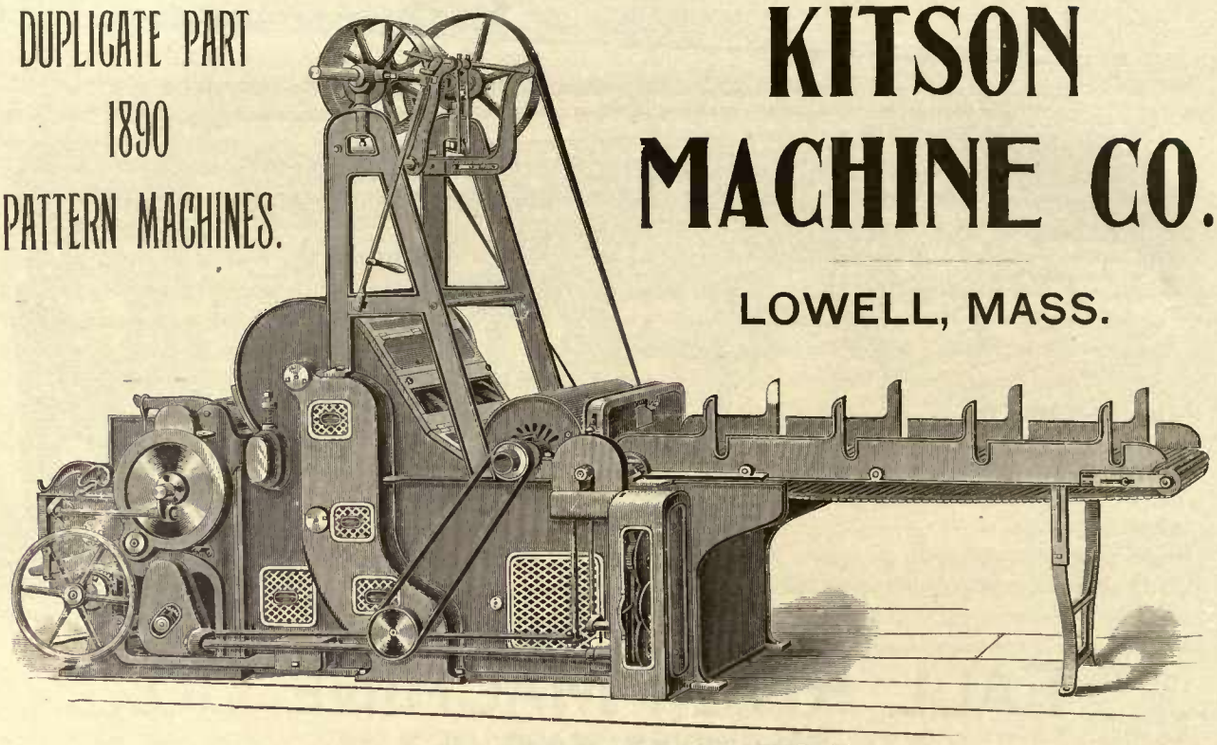

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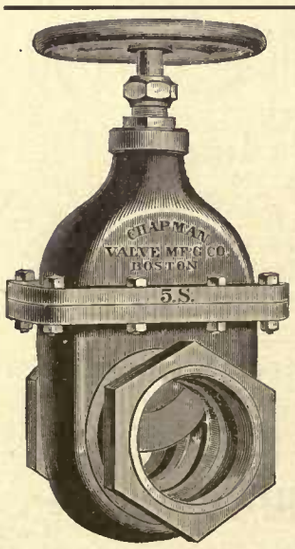

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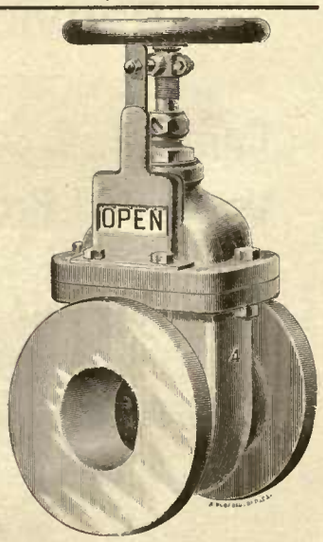

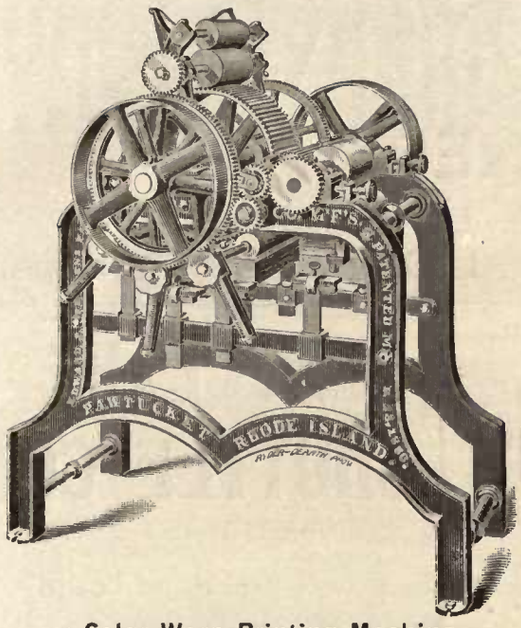

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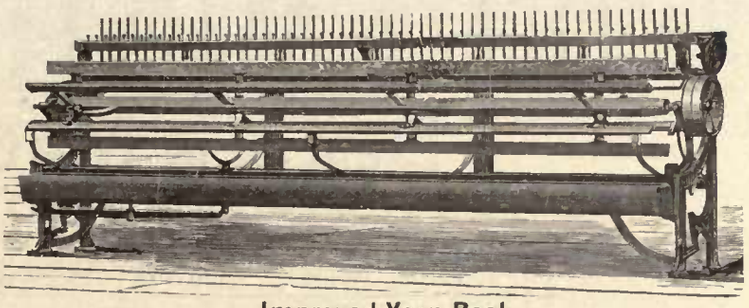

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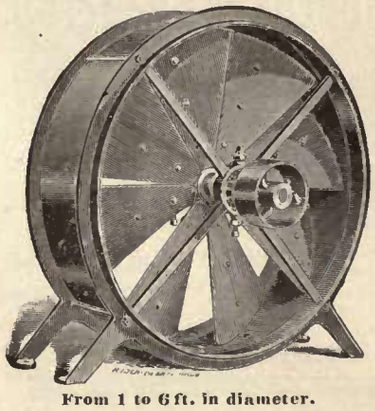

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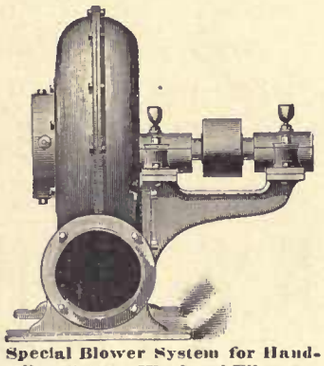

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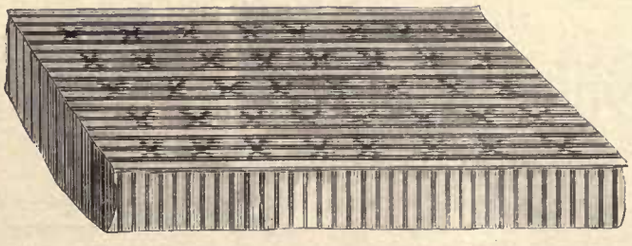

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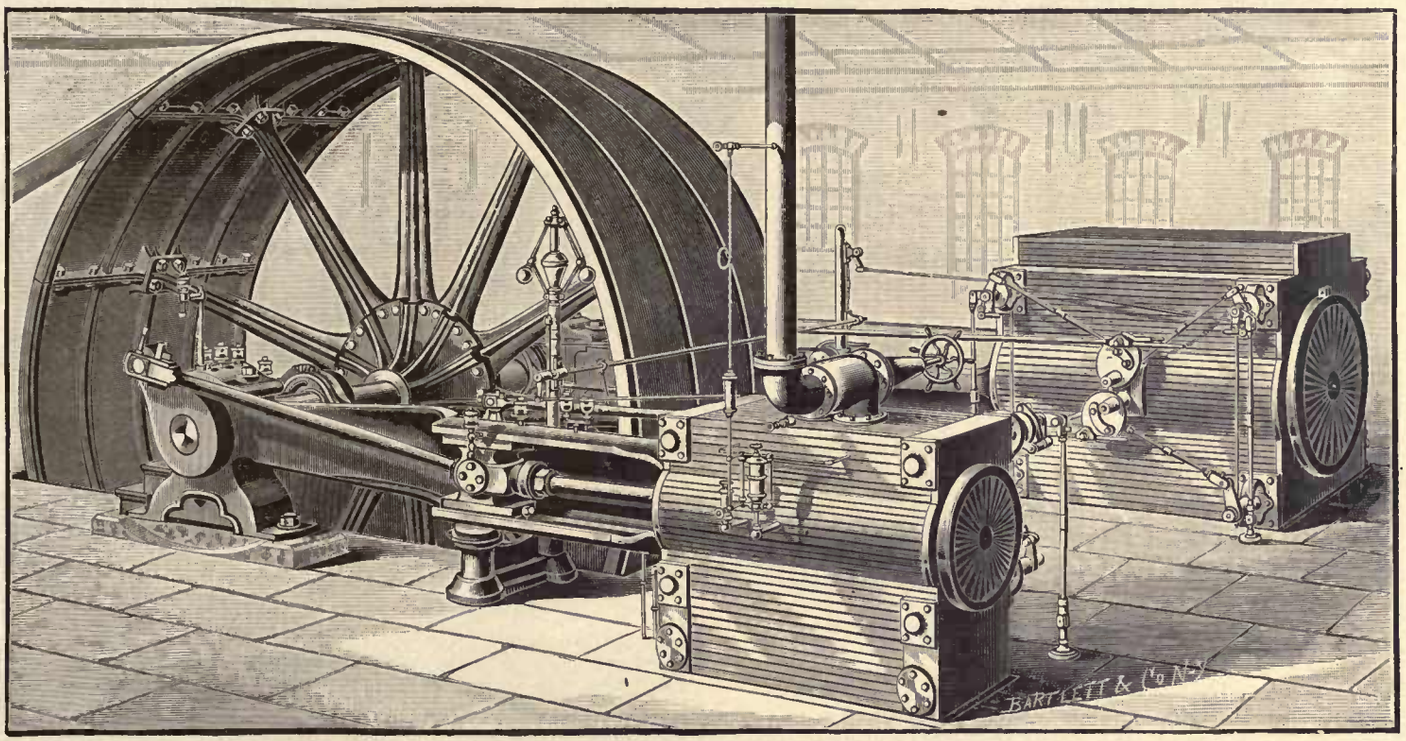

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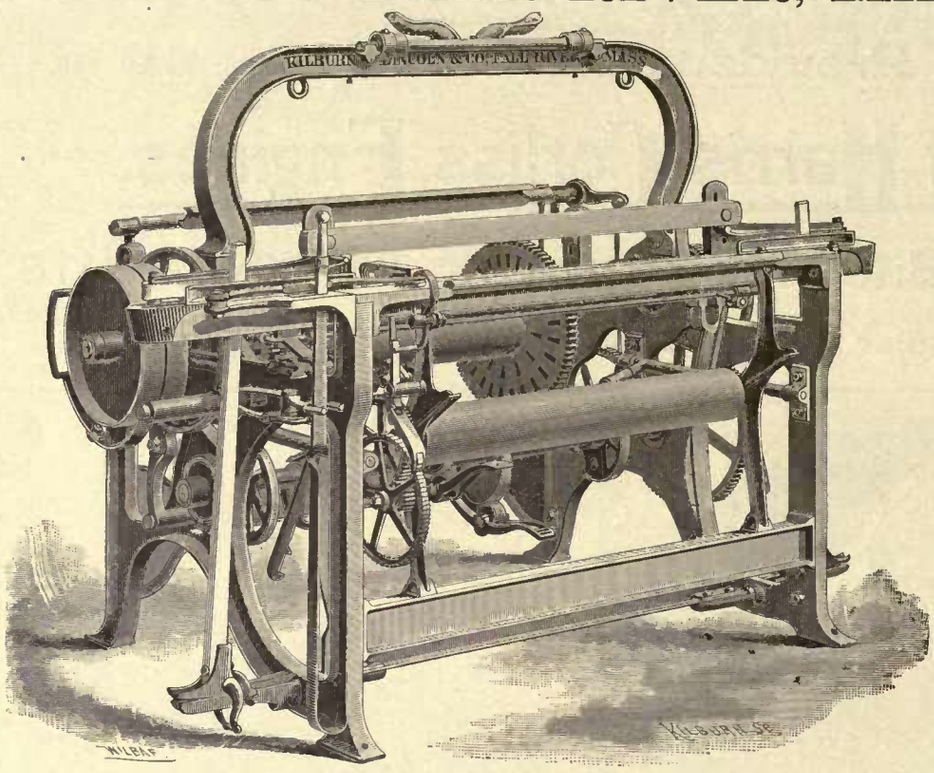

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STATEMENT NOVEMBER 18, 1890.

Real Estate and Mortgages,	$984,580.03
Invested in Stocks and Bonds,	195,750.00
Personal and Collateral Loans,	83,550 00
Cash on hand,	75,083.45
	$1,338 963.48
Amount due depositors,	1,227,757.72
Profits on hand,	$111,205.76

The Bank is open for business from 9 o'clock A. M. to 3 o'clock P. M., and on Saturday evenings from 7 to 9 o'clock.

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Capacity, 28.000 papers, folded.

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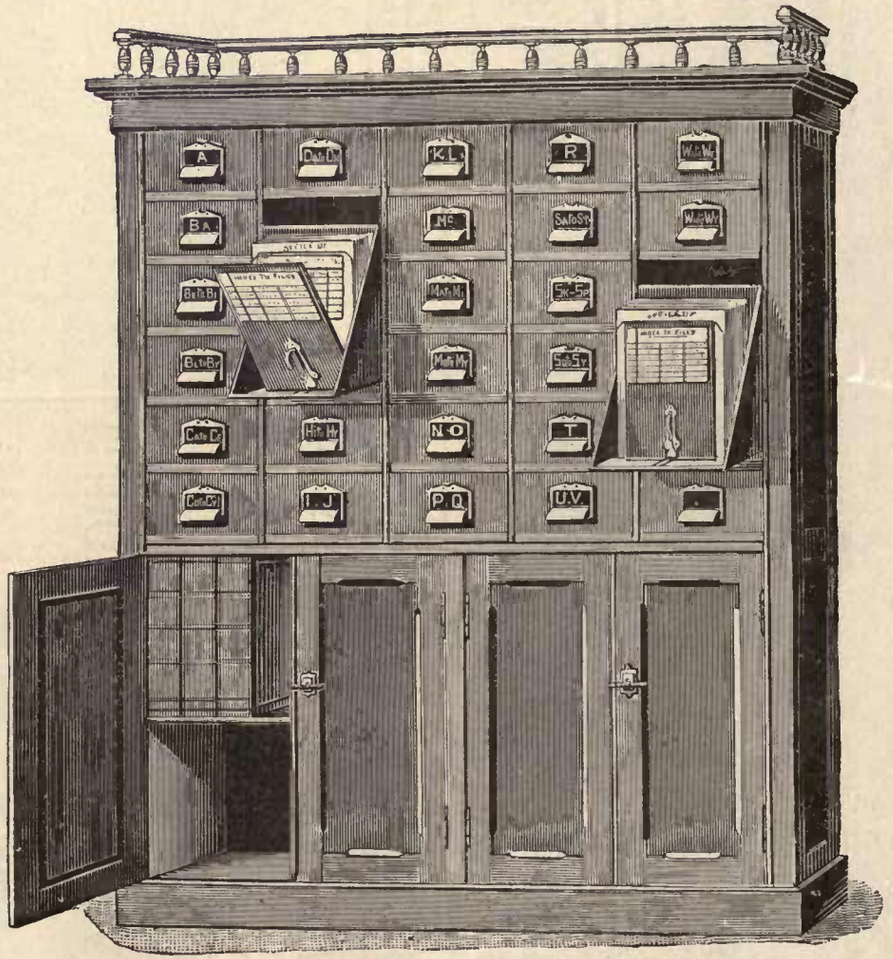
TENTH.—The entire system combines ECONOMY OF MONEY, TIME, LABOR and SPACE.



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Capacity, 30,000 papers, flat.

See Page 103.

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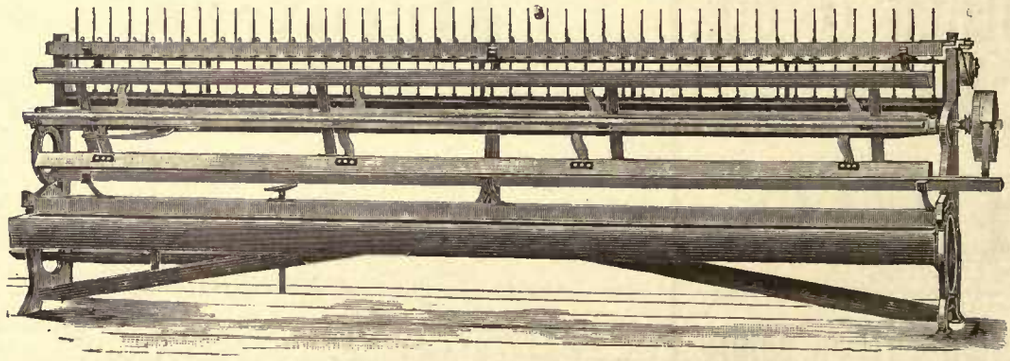

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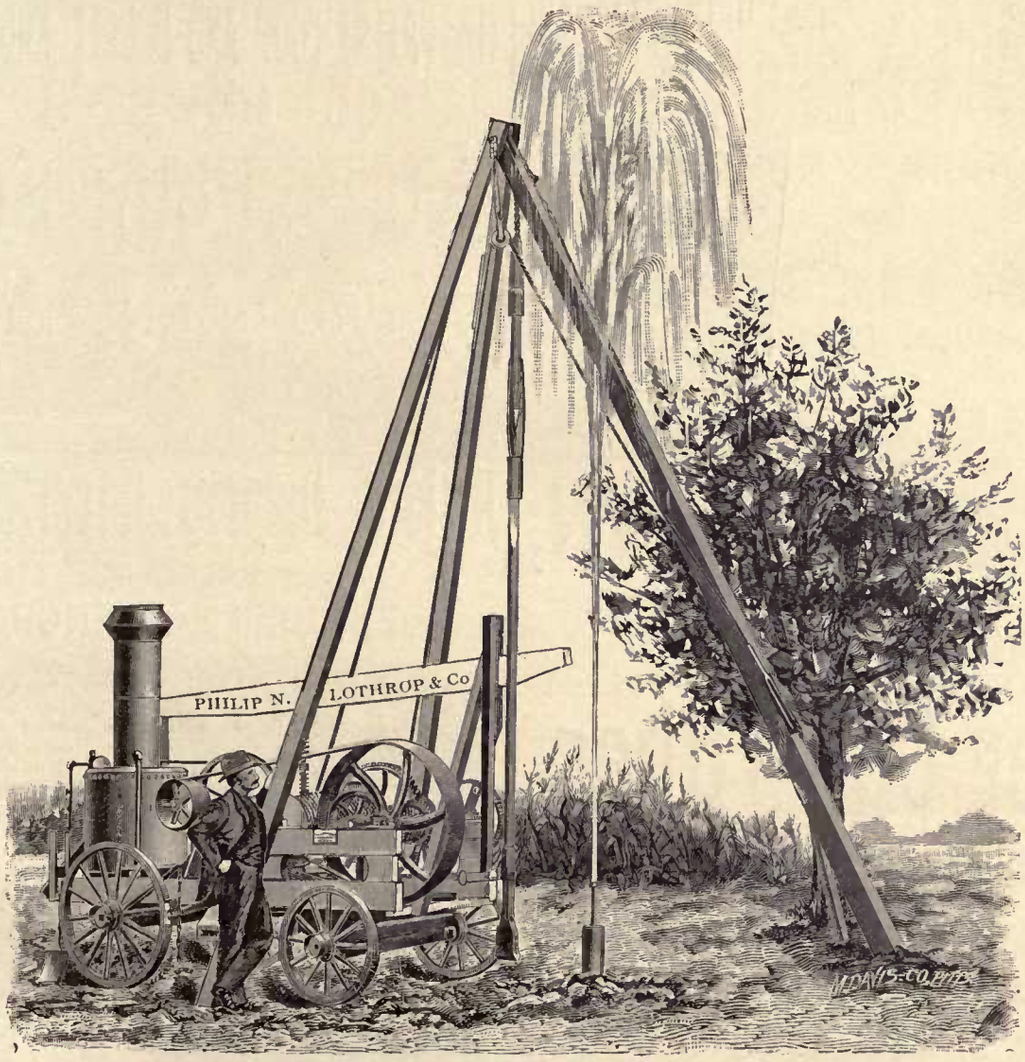

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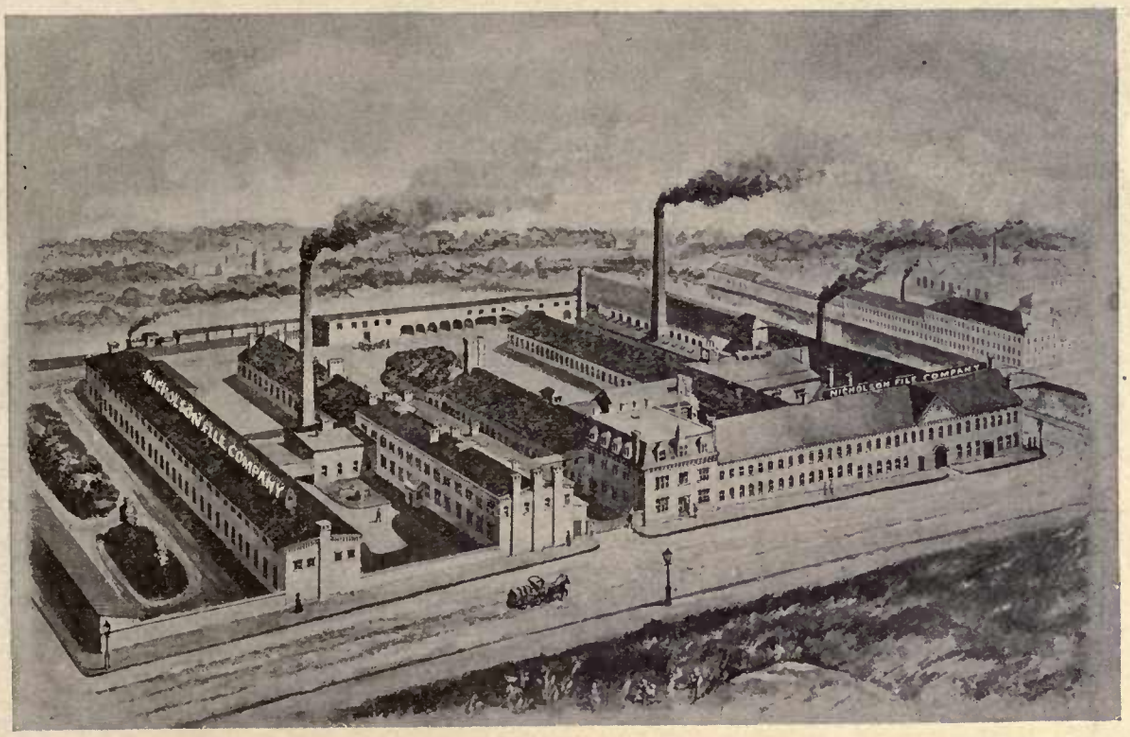

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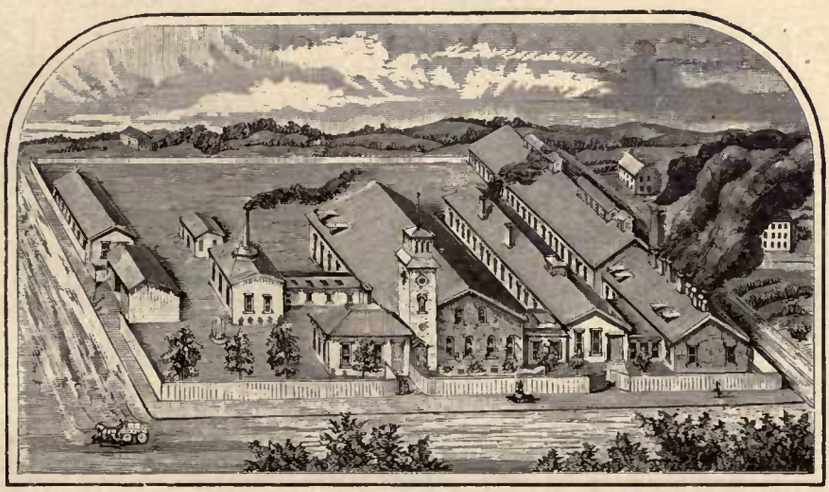

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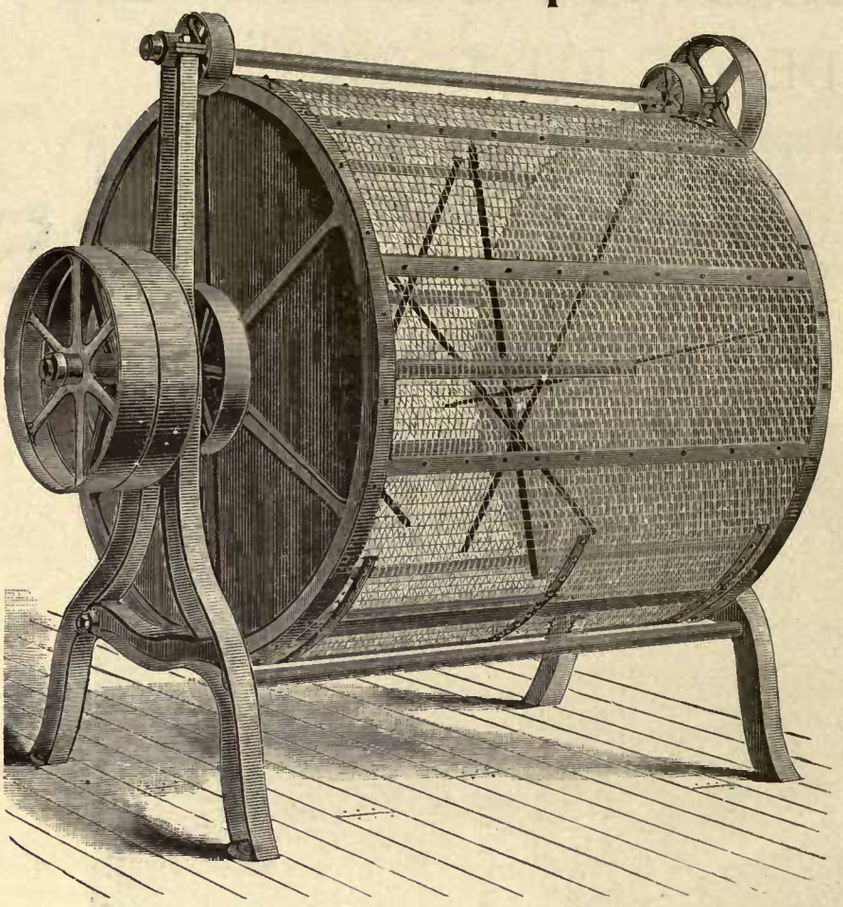

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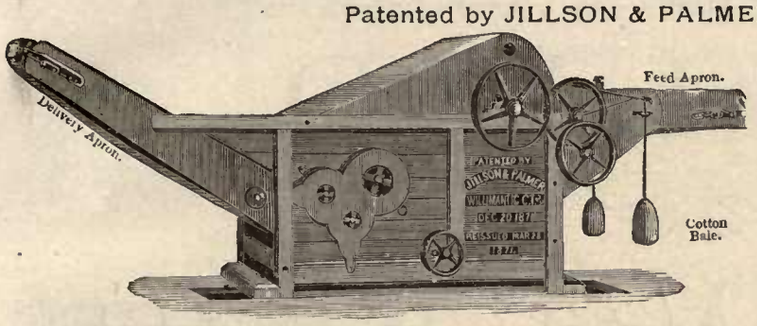

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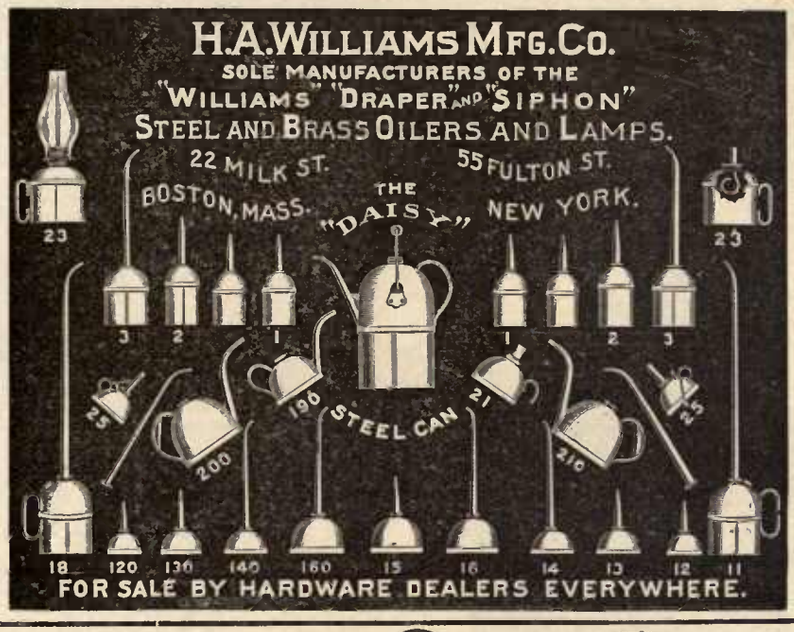

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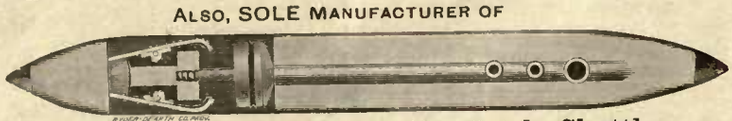

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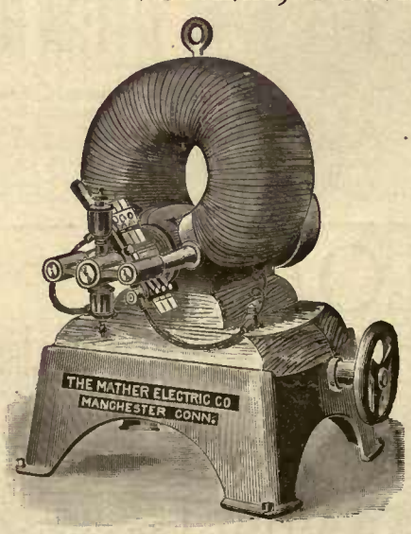

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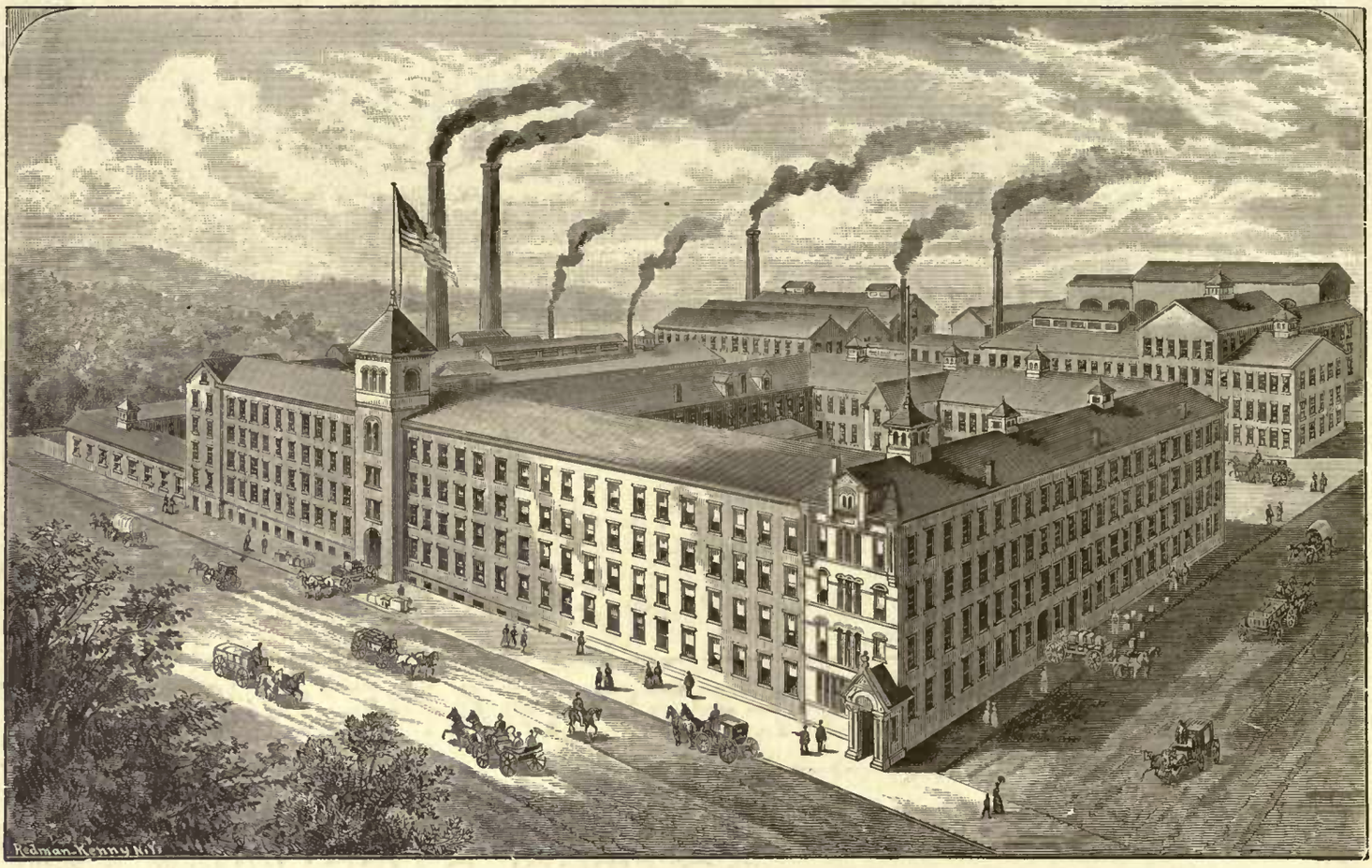

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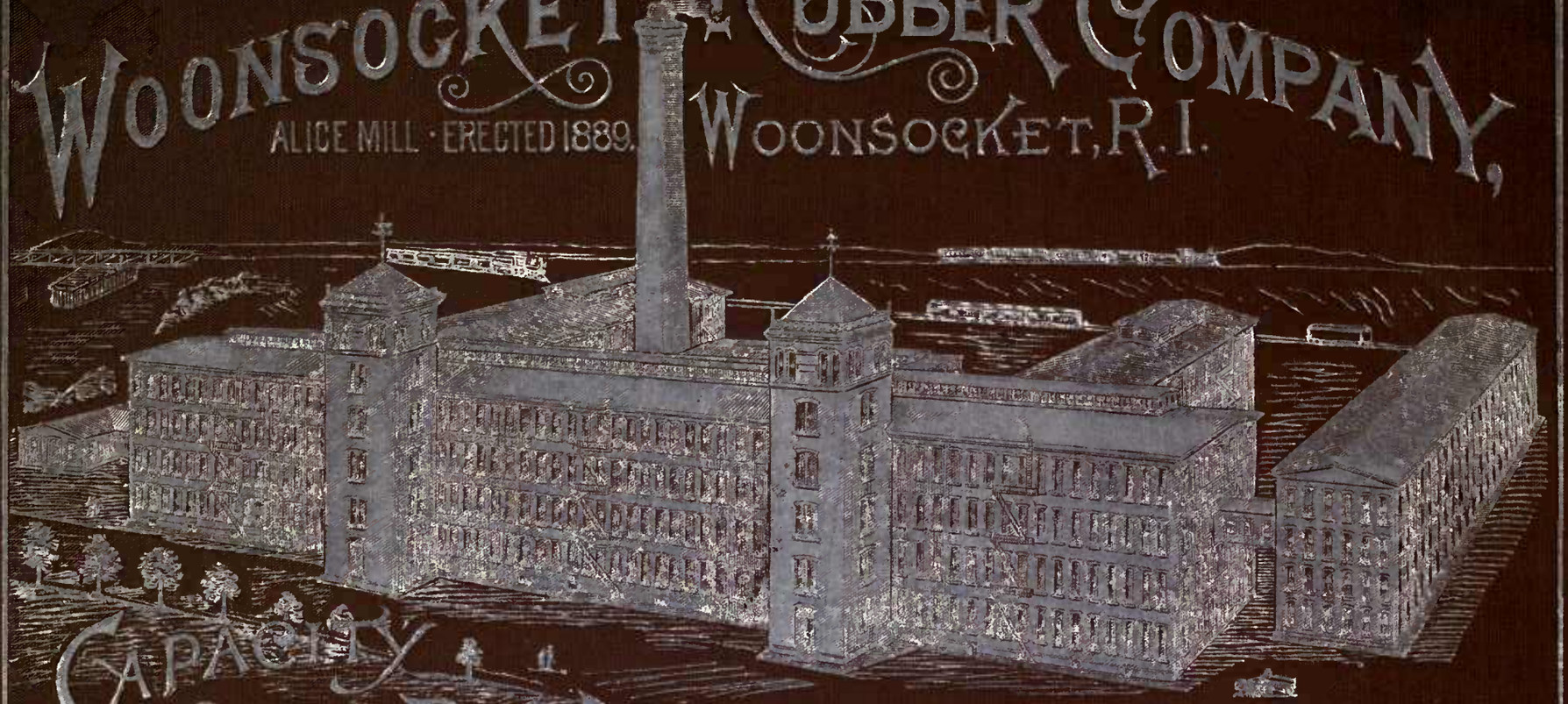

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