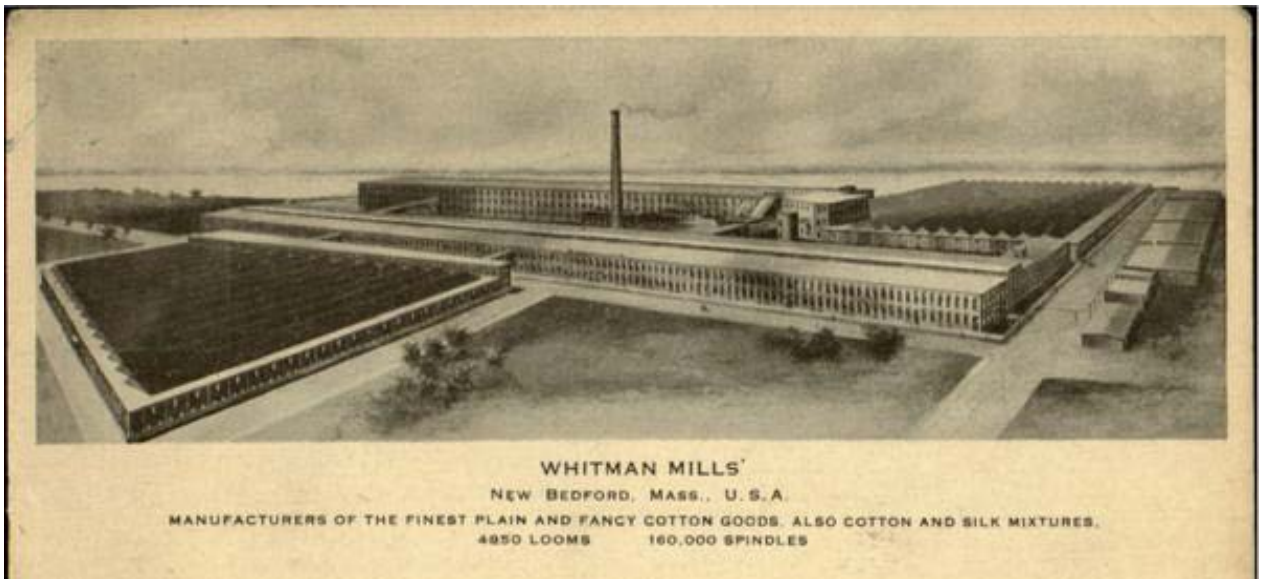
Whitman Mills

Riverside Avenue, between Coffin Street and Manomet Street, New Bedford

Established in 1895 by Harding, Whitman & Co. The Whitman Mills were one of the first new textile companies in the city founded by outside interests. Named after William Whitman (1842-1928), a Nova Scotia native who began his career in 1867 at the Arlington Mills in Lawrence. In 1909, Harding and Whitman split. These mills remained part of Edgar Harding's interests. William Whitman kept the nearby Manomet and Nonquit Mills (as William Whitman & Company), and then began a period of great expansion northward. In 1917 the Whitman Mills had a capacity of 175,088 spindles and 4,932 looms.

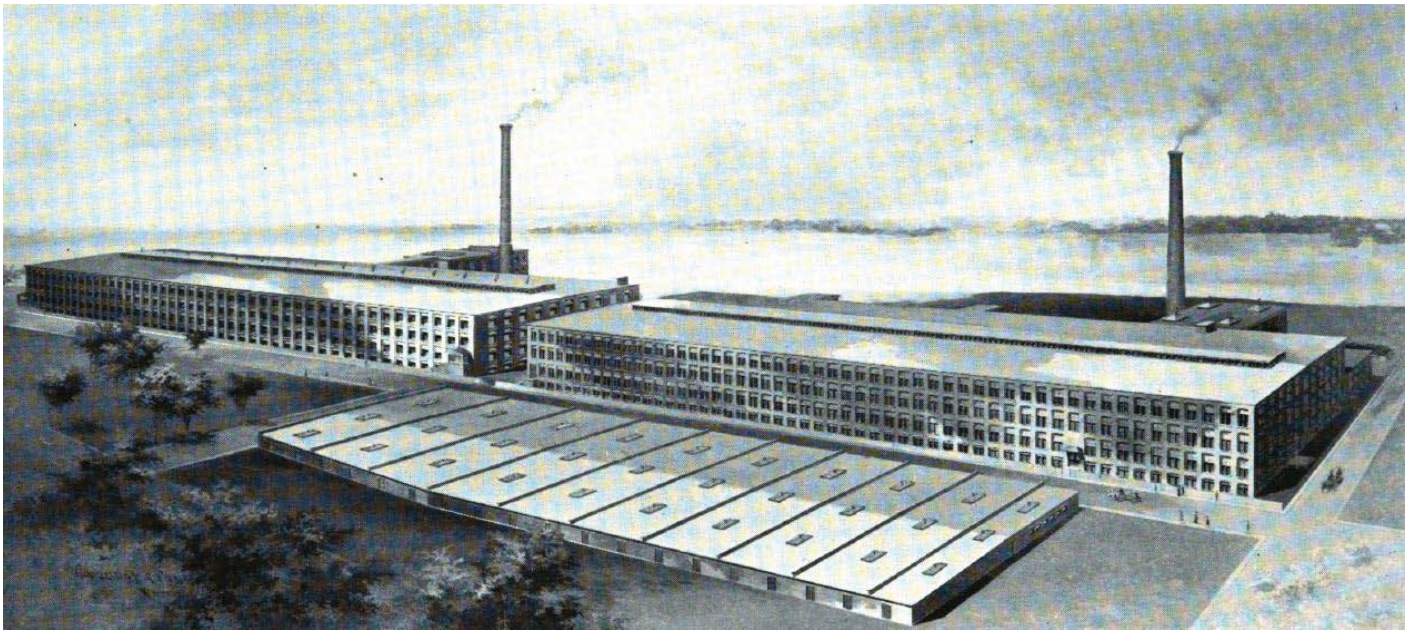
Mill No. 1 (1896) measures 980 ft by 125 ft with 2 stories; Mill No. 2 (1902) is 570 ft by 104 ft with 2 stories;
Weave Shed #2 is 301' x 303', with a 35' wide, 2-story Cloth Room along the Coffin Street end. Weave Shed #1 was built in 1910 across Riverside Avenue, and demolished in 1934, after the Whitman Mills Corporation was dissolved. The Whitman Mills had a central powerhouse serving the entire complex.



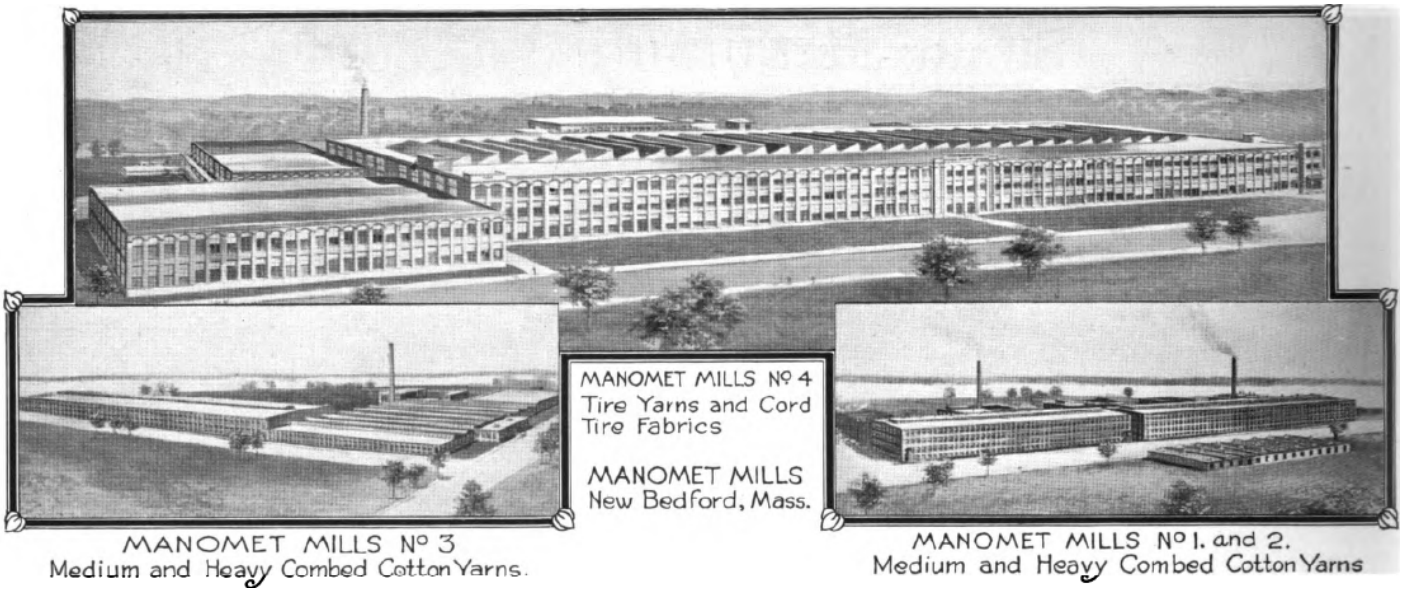
Manomet Mills - Riverside Ave / Belleville Avenue / King Street, New Bedford

Established in 1903 under the partnership of Edgar Harding and William Whitman for the production of medium and heavy combed cotton yarns. Mills No. 1 and No. 2 were each powered by their own powerhouse, which contained Corliss engines that powered generators and rope drives to operate the spinning departments. Manomet Mills (1-3) had 203,040 spindles in 1917. After the opening of Mill No. 4 on King Street in 1921 it had 318,000 spindles.

Mill #1 (1903) – 506' x 133' x 3.5 stories
Mill #2 (1908) – 488' x 125' x 3.5 stories
Mill #3 (1916) – 618' long (+ 1 story sawtooth shed) - Sold to Nashawena in 1925, converted to weaving, as Nashawena Mill "B". Later owned by Aerovox. Demolished by USEPA in 2011 due to ongoing concerns with contamination.
Mill #4 (1921) – Originally to be named "Waquoit", Manomet No. 4 was chosen. (More info on Page 8, below).



1910 view of Manomet Mills #1 and #2

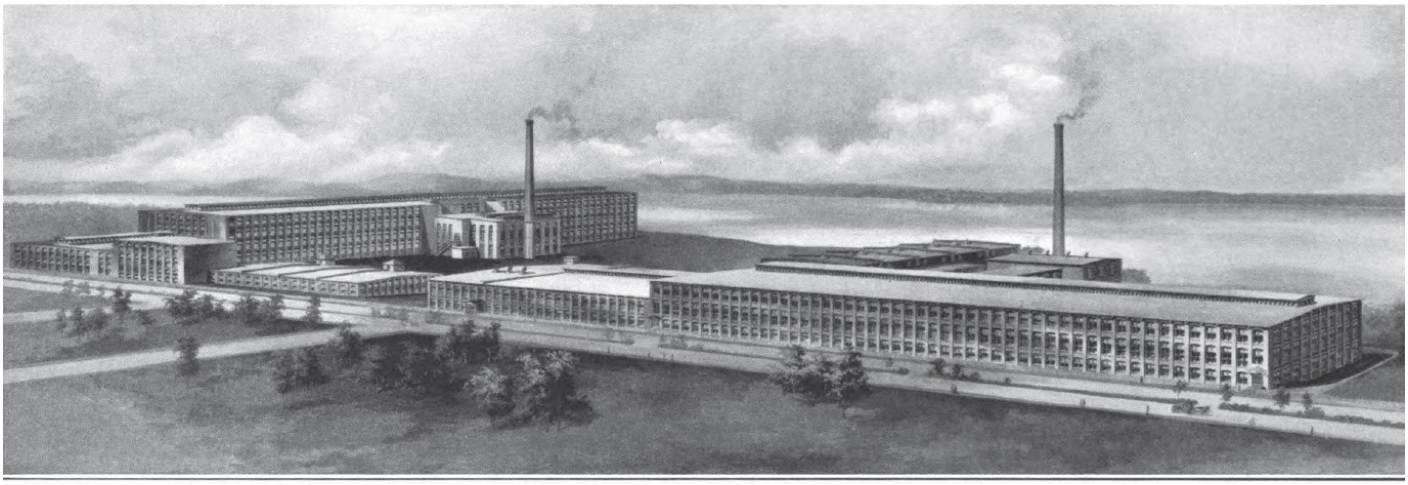


1921 view of Manomet Mills 1 through 4

Aerial view of Manomet Mill No. 3 (since demolished), aka Nashawena "B" / Aerovox Mill.
Later additions along Howard Ave. by Nashawena (and later Acushnet Process Company / Acushnet Rubber Company.)
Nonquit Mill No. 2 is at the top of this image (now occupied by Titleist).

Nonquit Spinning Company - Belleville Avenue, New Bedford

Established in 1906 as part of the partnership of Edgar Harding and William Whitman for the production of fine combed cotton yarns. Became as Nonquitt Mills in 1929 (both spinning and weaving).
Mill #1 (1906) – 478' x 130' x 3 stories (+ 2 story addition) – Sold to Fiber Leather Manufacturing Company in 1948. Mill #2 (1909) – 565' x 136' x 4 stories – Sold to Aerovox Corporation in 1952, as their No. 2 Plant. Sold to Acushnet Process Company in 1966 (later Acushnet Rubber Company / Titleist).

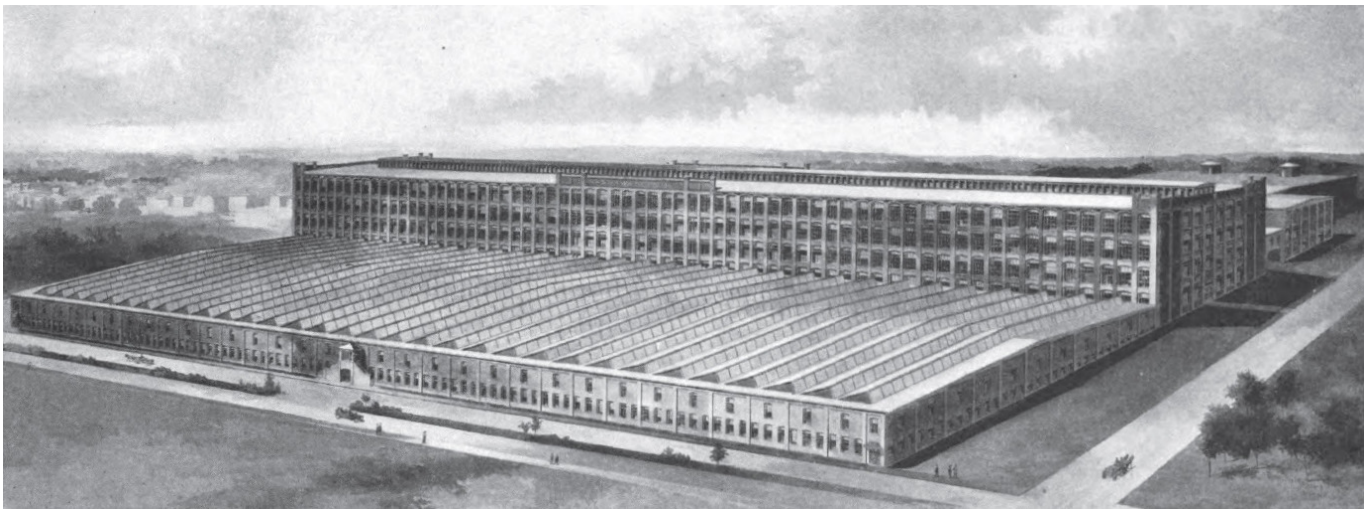


MILL NO. 2 MILL NO. 1

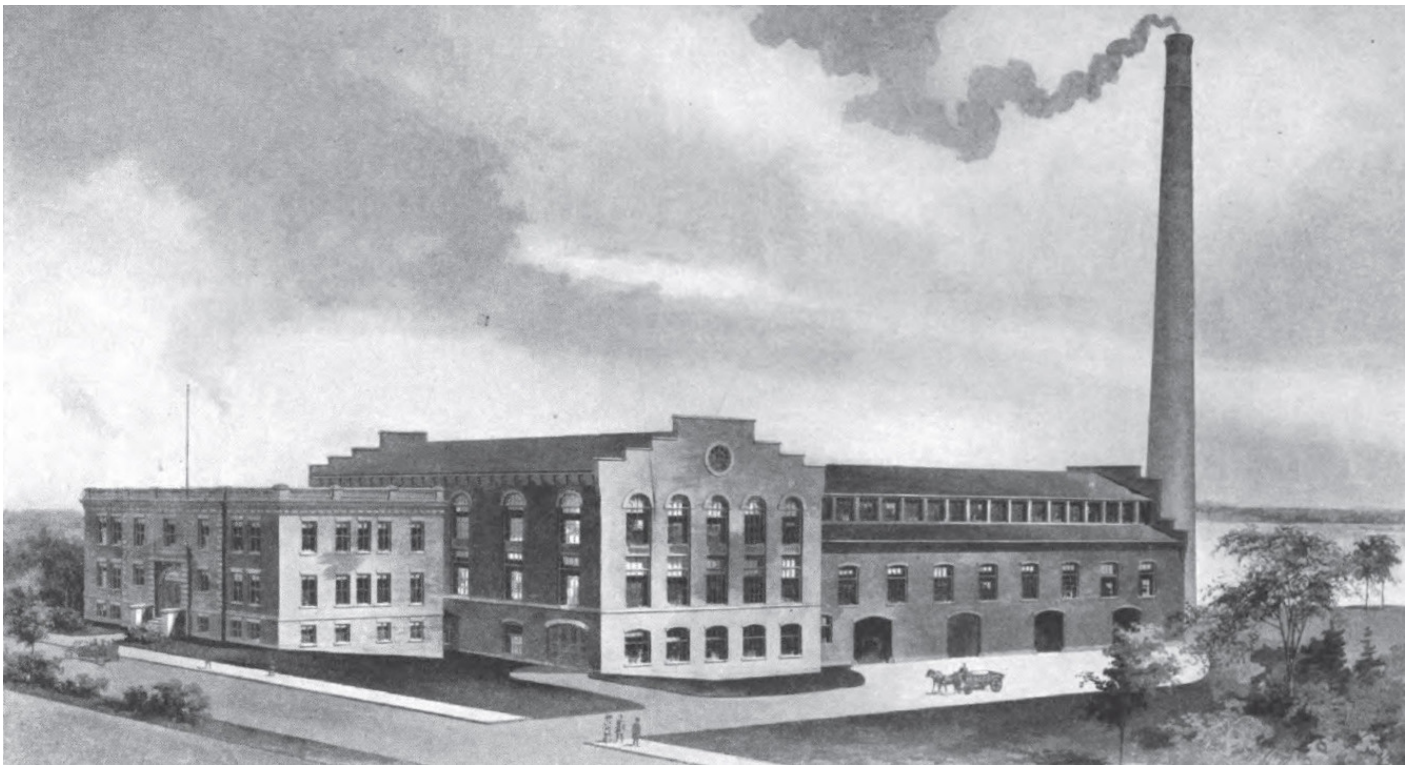
NONQUITT SPINNING COMPANY, 1910
New Bedford, Massachusetts

NASHAWENA MILLS - Belleville Avenue, New Bedford

Incorporated in June 1909 as part of William Whitman & Company, just after the split with Harding. This mill produced fine combed cotton cloth. It was considered among the largest and most modern textile factories when built in 1910. Spinning Mill #1 (1910) 794' x 136' x 4 stories, with 255' addition built in 1916
Weave Shed (1910) – Two-story weave shed, said to be the largest weave shed in the world (803'x278') + (255' x 155') Addition built in 1922 (1,058' overall length). - Now occupied by Joseph Abboud Manufacturing Co.
Power Plant (1910) – Provided electric power for the two Nashawena Mills across Belleville Avenue.
1917 Capacity: 145,000 spindles and 3,324 looms. In 1925, Nashawena purchased Manomet #3, which became known as Nashawena Mill "B". Weave shed added. In 1925, Plant "B" was sold to General Cotton Corporation. Nashawena Plant "A" operated until 1935, and was partly re-opened in 1937.



Nashawena Mills Weave Shed and Spinning Mill (1910)



Nashawena Power Plant and Office (1910)

THE NASHAWENA MILLS, NEW BEDFORD, MASSACHUSETTS.

The Nashawena Mills, now nearing completion in New Bedford, Mass., are the largest cotton mills ever constructed at one time and embrace, exclusive of a basement for shafting and the power house, somewhat over 700,000 sq. ft. of floor space. They are located in the northern part of New Bedford, fronting on Belleville Avenue, and form part of the Whitman group of mills, which, with the Nashawena installation now under way, have a total of 405,000 spindles.

The new mill will contain 150,000 spindles and 5000 looms and will be devoted exclusively to the production of very high-grade cotton goods, which point has had a notable bearing upon at least one feature of the installation, which will be referred to later. The new layout consists of three distinct structures, a four-story spinning mill, a two-story weave shed, and a power house. The spinning mill, 800 ft. long, is 135 ft. wide, while the weave shed, located directly in front of it, as shown in the accompanying illustration, is 285 ft. wide and 800 ft. long. A glance at the sections shown herewith will indicate clearly the arrangement of the two-story weave shed, one part of it having a rather shallow basement, in which the line shafting will be installed, and the other portion a deep basement which will be used for a cloth room and machine shop.

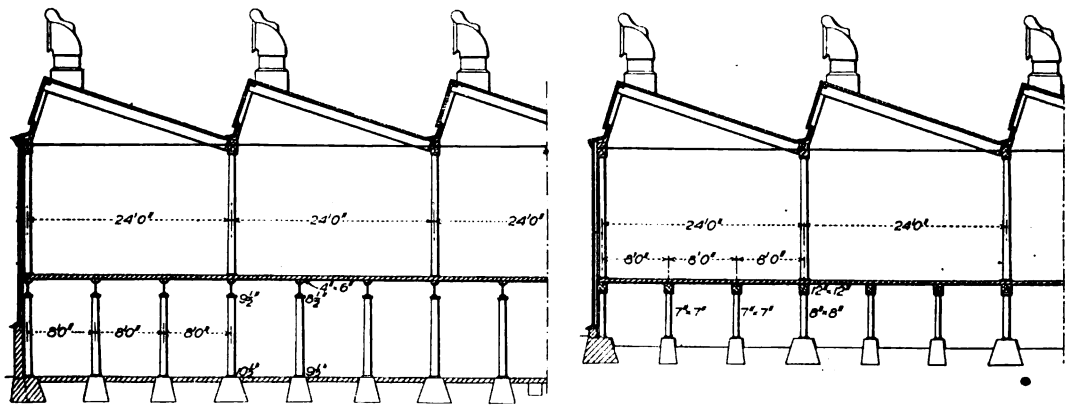
Both structures are of slow-burning mill construction, following the standards of the Mutual Fire Underwriters' Association, except that the high cost of timber floor joists made it more economical to use steel I-beams in place of wood. Both were built on concrete foundations, carried up to grade line, and the plain concrete footing rests on hard gravel. The foundations of the power house go down 6 to 12 ft. below high-tide level.

The accompanying transverse section of the spinning mill indicates the transverse column spacing employed, the arrangement of steel I-beam floor joists and of the floor construction. The column spacing transverse, 26 ft., is that found by experience the best adapted to cotton working machinery, while longitudinally the columns are on 12-ft. centers, this being, accordingly, the span across which the floor loads must be carried by the floor construction.

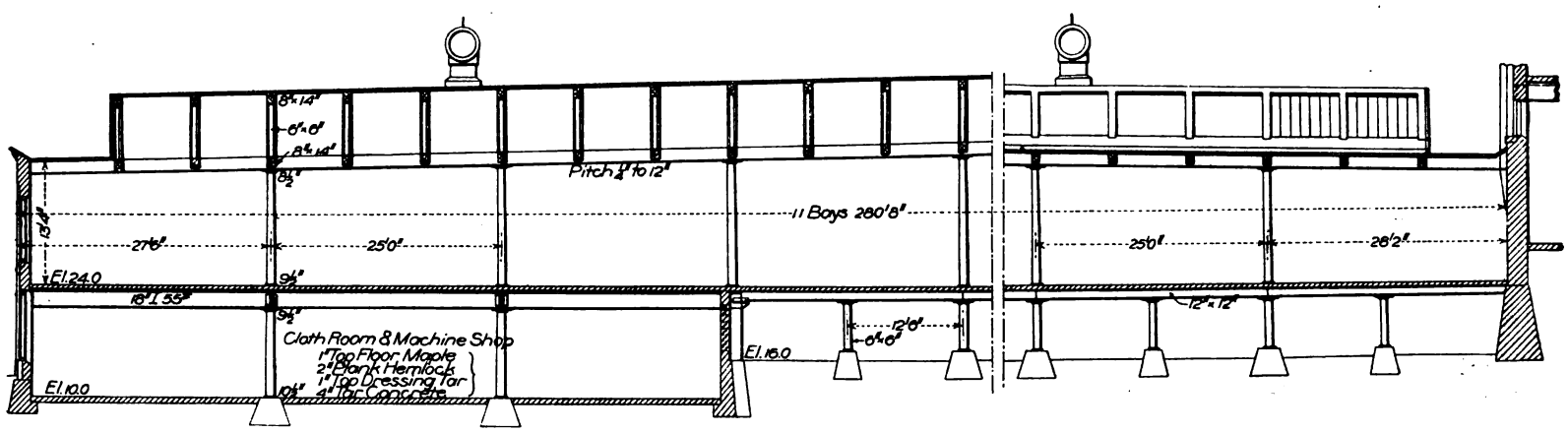
The weave shed is divided transversely into 11 bays, which, excepting the two end ones, are 25 ft. wide center to center of columns, while the longitudinal spacing is considerably longer than the corresponding dimension in the spinning mill, being 24 ft. center to center of columns. This applies, however, only to those columns in the main floor of the shed whose only duty is to support the light roof construction; in that part of the basement used as a cloth room the columns are obliged to carry the heavy machinery loads, and accordingly the longitudinal column spacing is reduced to 8 ft. In the shallow basement the transverse span is also shortened, by placing a column midway between the others, giving two 12½-ft. bays. This also allows a change in the floor construction to be made by the substitution of 12-x 12-in. hard pine joists instead of the steel I-beams which are used in the spinning mill and for that portion of the main floor of the weave shed which spans the cloth room.

The floor construction is of more than usual interest, not only on account of the employment of steel I-beams, but also on account of the arrangement of the various layers of the floor itself. In the first place the attachment of the wood flooring to the steel I-beams requires a special detail; it consists in placing upon and attaching to the upper steel flange a 4 x 8-in. nailing strip in the spinning mill, and a 4 x 6-in. strip in the weave shed, upon which the floor itself is laid. These nailing strips are attached to the I-beams by means of ¾-in. coach screws passing through flange holes, which are punched at the shop, and are placed on both sides of the web at intervals of about 5 ft.

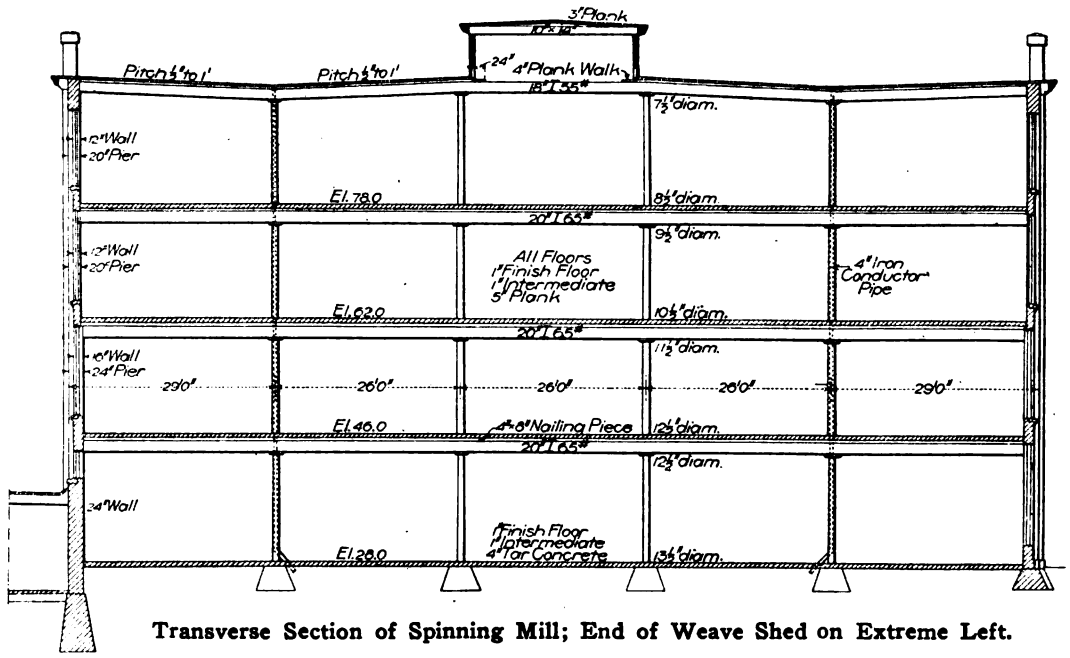
The flooring placed upon these nailing strips in the spinning mill consist of three courses of floor boards; the first a 5-in. hard pine plank to form the main carrying members, then a 1-in. intermediate floor of cheap North Carolina pine, and finally a 1-in. maple finish. The 5-in. main floor is run longitudinally, carrying the heavy floor loads to the steel I-beam joists; the intermediate floor is laid at right angles to it, while the 1-in. finish is parallel with the main 5-in. flooring, and with the length of the structure. The purpose of this scheme is to secure a satisfactory floor and still allow the 1-in. finish to be laid longitudinally, the objection to laying it transversely being that in renewing the floor it would be necessary to interfere with operations in two bays, while, on the other hand, if laid longitudinally the renewal operations may be confined to one bay only. To lay the finish directly upon the 5-in. main flooring would make it necessary to place joists in the two layers directly over each other, here and there, and con-



Two Partial Longitudinal Sections through the Weave Shed.



Partial Transverse Section through the Weave Shed, Showing Deep and Shallow Basements; Spinning Mill Wall on Extreme Right.



Transverse Section of Spinning Mill; End of Weave Shed on Extreme Left.

sequently form a weak spot where the floor might open up under the vibrations of the machinery. Accordingly a cheap flooring is placed between the main and finished planking to bind the construction together in a very rigid manner. Since its purpose is not to contribute to the strength of the construction a very cheap grade of material answers very satisfactorily.

On account of the general value of plenty of light for manufacturing operations, and in particular because of the very high grade of goods which will be produced in this mill, careful study was given to both day and night lighting. The spinning mill is so constructed that 80 per cent of the wall area is set with glass, while saw-tooth construction, giving the very desirable north light directly from above, is employed in the weave shed. In the latter construction, it may be noted, the saw-tooth arrangement stops about 10 ft. from each end of the width of the building, as shown in one of the sections, making it an easy matter to get at any portion of the roof without climbing up and down over the saw-tooth.

The side windows of the spinning mill are glazed with a combination of plain and of maze glass, an arrangement adopted in consideration both of lighting values and the feelings of the employees. The maze glass is used in the upper panels and in the double transoms over each of the 9-ft. windows between the brick piers, so as to throw the light well back to the inner bays. The plain glass, on the other hand, is used in the lower panels, so that the view of the operatives is not obstructed. Experience in other mills in which maze glass has been used in the lower panels indicates that the operatives become dissatisfied with the arrangement, feeling somewhat as if they are imprisoned, and that the use of such glass in the lower panels is an evidence that they are suspected of a desire to waste time.

The night lighting, it is worthy of special note, will be entirely by Tungsten lamps grouped in clusters.

The matter of waste of time by employees, and also the allied one of unavoidable loss of time, as is well known, play an important part in mill operation. Consideration of the latter of the two has resulted in the Nashawena Mills in placing toilet rooms in such locations that no operative will be obliged to go more than 200 ft. from her work, while the drinking fountains have been placed so that the maximum distance from any operative's position is 100 ft. These spacings apply both to the spinning mill and to the weave shed. The close spacing of the fountains is especially important where goods of the highest grades are woven, reducing the time that an operative is away from her machine.

The drinking fountains are of the no-cup type, in which the water pressure is so regulated that a stream is directed up from, and above the end of, an open tube, over which the mouth is placed. These fountains will be allowed to run continuously, so that it will not be necessary for one who wishes a drink to open a valve or otherwise turn on the supply. While under ordinary circumstances this would mean a great waste of water, that objection does not apply in the present installation, since all of the overflow is carried off and into the boiler house, where it is used for feed water. An ice-box will be placed in the base of each fountain.

The toilet rooms have been constructed along the latest sanitary lines, with concrete floors finished with a terrazo wearing surface and walls of glazed brick so that they can be washed down with a hose.

Salt water, drawn from the adjacent Acushnet River, will be used exclusively for flushing water in the toilets, the principal reason for its use being the fact that it can be supplied cheaper than fresh water could be bought from the city water mains. Moreover, it has been observed for the last four years in other large mills of the Whitman group, already referred to, that the toilet rooms using salt water are entirely free from odor, and though the subject has not been scientifically investigated, the designers believe that there is some ground for the opinion that this condition is due in part to the use of sea water. The cost of the piping system, it should be observed, is considerably increased by the use of such flushing water, since the salt would attack iron; brass piping is therefore employed exclusively. The salt water is supplied by a centrifugal pump located in the power house.

All of the power required in the entire installation for driving machinery and for lighting, and all of the steam for heating, are supplied from a power plant in a separate building, located on the opposite side of Belleville Avenue from the main structures, and connected therewith by a tunnel under the street. Through this tunnel are run all of the steam and water pipes and the electric wires. The power plant is in reality divided into three separate portions, a boiler room, an engine room and a fire-pump house, the last being adjacent to but having absolutely no means of communication with the other two departments. Steam will be supplied by sixteen 300-hp upright Manning boilers, built by the Bigelow Company, of New Haven, Conn. This type of boiler, the designers of the plant state, was adopted principally because of the very excellent quality of feed water obtainable from the city mains, reducing the scale to a minimum, and to the fact that their experience indicates that about 5 deg. superheat is obtained with this type. The boilers are hand-fired, and the coal is delivered by teams and dumped from the yard grade to the boiler floor, about 6 ft. below the ground surface. The chimney, 250 ft. high and 15 ft. 8 in. in inside diameter at the bottom, is of reinforced concrete construction, built by the Alphons Custodis Chimney Construction Company, of New York City.

The main engine room units are two 3000-kw Allis-Chalmers turbo-generator sets, each equipped with the necessary condensers and electrically driven vacuum pumps, the two latter supplied by the Wheeler Condenser & Engineering Company, of New York. There are two 100-kw exciters, each capable of exciting both of the main units, so that there is always one spare on hand. One of them is electrically and the other steam driven.

Besides the two 3000-kw turbo-generator sets for power, there is a 500-kw set for lighting current and for driving auxiliary machinery. It is intended to take the power required for night lights or watchman's circuit and any power or lights required at night for, say, repair work, from one of the exciter sets, and the wiring and switches on the switchboard are so arranged.

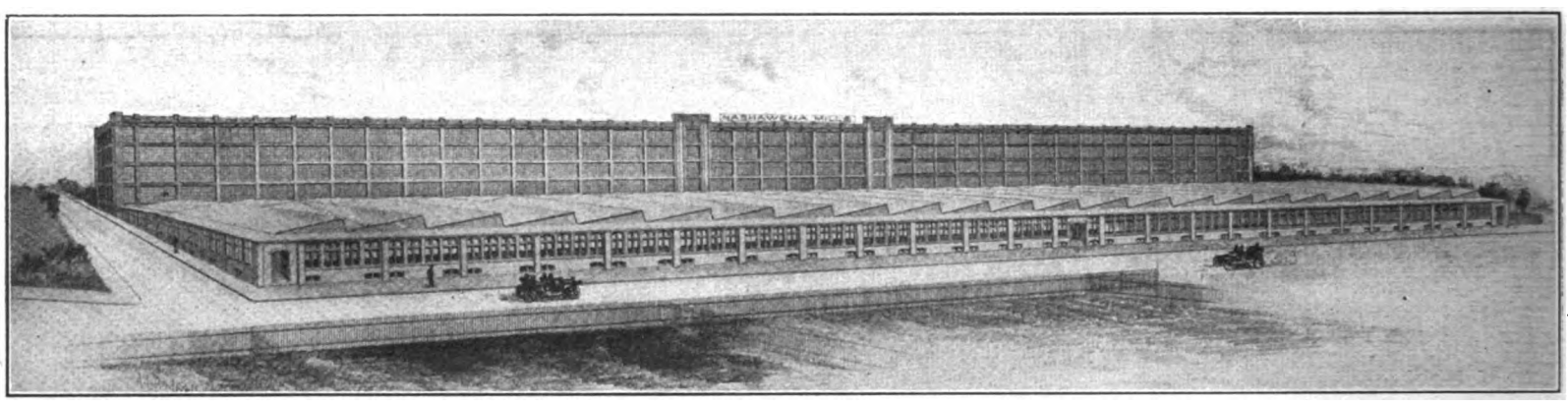
All of the machinery both in the spinning mill and in the weave shed is electrically driven by individual motors or by small group drives. These motors operate on three-phase alternating-current circuits at 600 volts, and all of them are of the induction type, manufactured by the General Electric Company. The lighting circuits use 220-volt direct current.

Condensing water for all of the turbine units is conveniently obtained through concrete conduits leading to intakes in the Acushnet River, on the bank of which the power plant is located, and as the water is salt all of this apparatus is necessarily brass lined.

The fire protection system is out of the ordinary in that it is tied in with the system of four adjacent cotton mills, so that with its own standard underwriter's fire pump the system can be served by seven pumps, each with a capacity of 1500 gal. per minute. Each of the other four mills referred to consist of four large structures, and the mains are looped around them and the Nashawena Mills, and then are connected with the New Bedford city water supply, as an additional safety precaution in case of failure of the above pumps, which, however, may be regarded as a practical impossibility. Salt water is used for the fire protection system, and suitable valves are placed between the fire main loop and the fresh water system. The entire plant is equipped with a sprinkler system, with the exception of the boiler and power house, where great damage might be done to the generators. For this reason these buildings have concrete roofs.

On account of the tremendous size of the buildings the vacuum system of steam heating will be employed, the contract having been awarded to the Gem Fire Extinguisher Company, of Providence, R. I.

The humidifying system will be supplied by the Cramer Moistening Company, of Charlotte N. C., the control of which is automatic, regulating the temperature as well as the humidity. The regulating devices can be set just as desired, depending upon the particular class of work in the room in question, the humidities required ranging from 75 to 90 per cent for different processes. By independent regulation the exact conditions desired may be obtained, so that while in some rooms low temperature and high humidity are required, just



Sketch of the Nashawena Mills at New Bedford; Weave Shed in the Foreground.

the opposite conditions may obtain elsewhere in the plant.

Naturally the means of taking raw, partly finished and finished materials from one point to another is an extremely important item in a plant of this magnitude, but at the present time the plans have not advanced sufficiently to permit of their description. However, it is understood that no expense will be spared to secure the most efficient method possible.

The entire plant, including all the structural and mechanical features of the spinning mill, weave shed and power house, and all of the architectural and engineering details have been designed by and are being built under the supervision of Messrs. C. R. Makepeace & Co., mill architects and engineers, of Providence, R. I. The officers of the corporation are Mr. William Whitman, the well-known mill man of Boston, president, Mr. W. B. Gardner, of New Bedford, treasurer. Mr. J. L. Burton is superintendent. The contractor for the structural features is the B. F. Smith Company, of Pawtucket, R. I.

WHITMAN MILLS NEW WEAVE SHED

The new weave shed of the Whitman Mill, New Bedford, Mass., now in process of construction, when completed in the spring, will be one of the largest in the world. This shed is of brick construction, one story high, and the dimension are 369 by 550 ft. It has a saw-tooth roof, supported by hard pine columns, and a double floor of hard pine and maple supported on steel beams. The interesting feature of the equipment of this new shed is the electric power equipment. Power is furnished by a 2000-kw. Allis-Chalmers generator driven by a steam turbine with six 150-h.p. Allis-Chalmers motors. The generator and steam turbine will be located in the old power-house.

Motors in the weave shed are arranged for group drive, with all the shafting underneath the floor. The Cramer moistening system has been selected for this shed. It will have overhead steam heat, and the Grinell sprinkling system for fire protection. When equipped this shed will have 3400 looms, and the product will be fine specialties in silk and cotton.

THE MODEL NASHAWENA MILL

The Nashawena Mill, which is being built at New Bedford, Mass., by a new company of this title organized by William Whitman, is the fifth big cotton mill that Mr. Whitman has given to New Bedford, and is one of three large mills that have been built under his direction this last year, these enterprises representing an investment of something over $6,000,000. The other two mills are the Nonquit No. 2, at New Bedford, and a big worsted spinning mill at the Arlington Mills, Lawrence, Mass.; to the latter plant is also being added a yarn-finishing and mercerizing mill of large size.

The Nashawena plant is unique in many ways, but particularly because of the fact that it is the largest cotton mill built anywhere in the world, so far as known, at one time, and has the largest weave shed in the world. In its constructive features it shows some radical departures from old standards, especially in the substitution of steel girders for hard pine beams, and in the superior lighting of the mill, 80 per cent. of the sides of the spinning mill being glass. The sanitary equipment is unapproached in its completeness, and no expense has been spared to make every detail of construction and equipment perfect, yet the cost of the plant per spindle is no larger than that of many inferior mills.

GENERAL ARRANGEMENT

The plant consists of five separate brick buildings ranged on both sides of Bellville Avenue, near the site of the Nonquit No. 1 mill. The weave shed, with the main building just behind it, extends north and south on the opposite side of the avenue from the Nonquit. Both buildings are 800 ft. long and the main mill is four stories high and 135 ft. broad, while the weave shed is 285 ft. broad and has one story and a basement 14 ft. deep and 80 ft. wide, running the full length of the building. The storehouse, occupying a position in the rear of the main mill, is 100 by 300 ft. and two tall stories in height. The boiler-house and engine-room and the offices are housed in two separate buildings on the east side of the avenue, near the Acushnet River, from which a plentiful supply of salt water is easily obtainable.

FEATURES OF CONSTRUCTION

As a whole, the plant is of standard slow-burning mill construction, except in some particulars where the nature of the work to be done, or where the vast size of the mill have caused original methods to be employed. The structure is supported on concrete foundations, going down 6 to 12 ft. below high-tide level. The main mill has steel I-beams because of the excessive cost of good hard pine, but the columns are mostly of wood. The bays are 12 ft. wide, with a transverse spacing of 26 ft.

In order to obtain the greatest volume of light possible, on account of the fine character of the goods manufactured, the window pilasters are only 25 in. wide, making the wall 80 per cent. glass. Maze glass is used in the transoms and in all the lower sash, excepting a narrow strip of clear glass at the bottom of each window. The floors are of three layers, the first being 5-in. hard pine nailed to a 4 by 8-in. nailing-strip, which is secured to the I-beams by means of ¾-in. screws put through specially prepared holes in the flanges. The first layer is laid longitudinally to carry the floor load to the joist, the intermediate floor of cheap 1-in. spruce laid at right angles to it is used for the purpose of tying the planking together, and a surface layer of 1-in. maple is put on parallel to the heavy planking, the object being that the floor may be renewed without interfering with the operations in more than one bay at a time—a difficulty that is always attendant on the use of transverse flooring. The roof is of 4-in. hard pine planks, with a pitch of 1-in. to the foot, and is covered with a tar and gravel roofing.

THE WEAVE SHED

In the weave shed the floor is similar to that of the main mill, with the exception that the bays are 24 ft. wide and that in the cloth-room there is an extra series of floor beams supported by columns, making the bays here 12½ ft. wide. The roof is saw-toothed construction, facing the north. However, the whole surface is not roofed in this manner, there being a 10-ft. platform extending along the edge on each side for the purpose of allowing workmen to have access to the roof without climbing over the glass. The side walls, however, have a very few small windows, because it was considered desirable to avoid the shadows side windows are likely to produce.

THE SANITARY PROVISIONS

With regard to the sanitary conditions, the Nashawena is an unusually good example of the theory that provision for the welfare of the employe is profitable. Salt water is used for cleansing the toilet rooms, because it has been observed that salt water removes the odors often prevalent in such rooms of old mills. This system, however, necessitates the use of a large amount of brass piping, which is rather expensive. The toilet rooms are further improved by the use of glazed brick for the walls and concrete floors covered with a terazzo wearing surface, so that these places may be washed down with a hose. In addition to placing them in all parts of the plant, the builders have built water fountains at close intervals. The method used here is notable. The fountains are of the "no-cup" type, from which one may drink without inconvenience and without using the unsanitary drinking cup.

On account of the immense size of the building the vacuum system of heating with overhead steam pipes is used. The temperature is further controlled by the Cramer moistening system, which can be so regulated as to warm or cool the air as well as to control the humidity.

THE LARGE POWER PLANT

The power plant is on the east side of Bellville Avenue and is connected

with the mill by means of a tunnel through which are carried all of the water piping, electric wires and steam piping. The power house is composed of three rooms—a boiler room, a pump room and an engine room. The boiler room is supplied with 16 Manning boilers built by the Bigelow Co., of New Haven, Conn., which are fired by hand. The gases are carried away by a chimney 250 ft. high, built of reinforced concrete by the Alphonse Custodis Chimney Construction Co. The engine room is equipped with two 3000-kw. Allis-Chalmers turbo-generator sets, each equipped with the necessary condensers and ten electrically-driven vacuum pumps. There is also a 500-kw. turbo-generator for the lighting and for driving the machine shop and auxiliary machinery.

The drive of the mill is entirely by electricity in small group drives. They are of the induction type and operate on a three-phase illuminating circuit of 600 volts. The lighting circuits use 220 volts direct current.

The fire protection of the plant is most thorough; it is connected with the system of the other mills of the Whitman group, so that the Nashawena can be served by seven pumps, each with a capacity of 1500 gal. per min.

The capacity of the Nashawena is 150,000 spindles and 5000 looms, devoted to the manufacture of high-grade novelties in silk and cotton.

Belleville Warehouse (1916) Nash Road & King Street, New Bedford, MA; Reinforced concrete; 964-ft x 100-ft x 7 stories; Capacity for 50,000 bales of cotton. It was purchased by Firestone in 1929. After 1945 it was occupied by the General Services Administration (into the 1970s). Until recently, it used as a warehouse by Building #19 Discount Chain (closed in 2013).

Manomet Mill No. 4 (1921); King Street, New Bedford, MA; The largest single-unit spinning mill in the world, designed with a capacity of 115,200 spindles for the production of cotton tire yarns (750,000 pounds per week), with electric power provided by the city plant. Main mill is 892 long by 168 wide with 3 stories and a saw tooth roof. The picker (seen here at left) is 130 long by 110 wide with 2 stories. The massive plant never operated at full capacity, and was sold to the Firestone Rubber Co. in 1927. In 1967, Firestone sold it to its present owner, Chamberlain Manufacturing Company, a maker of garage door openers.