

Sheldon Axle Co., Wilke-Barre, Pennsylvania

SHELDON & Co.'s NEW AXLE-WORKS AT WILKES-BARRE, PA.

From *Hub* March 1886.

In an item under "Trade News" in the January *Hub* we noticed the approaching removal of the Sheldon Axle-Works, now located at Auburn, New York, to Wilkes Barre, Pennsylvania; and below we describe the new shops and improved working facilities which they will possess in their new home. They have secured a lot within a mile of the center of WILKES-BARRE, containing about 14 acres, lying very level, but with excellent drainage, surrounded by railroads, and within 800 feet of a large colliery, with three other large collieries within a radius of a quarter of a mile. On this lot they are now erecting their buildings, which will consist of a finishing-shop, 310 by 100 ft., a forge-shop, 300 by 90 ft., with an engine-house located between the two, 46 by 60 ft., which will contain the two engines for running the forge and finishing-shop, the two furnishing them power of from 600 to 800 horse-power. These shops will stand in a direct line, and, at the side of the finishing-shop, will be their rolling-mill, 100 by 160 ft., in which, as they have formerly done, they will make the iron for their axles from the very best of wrought-iron scrap and reduce their steel billets. They contemplate, in the near future, adding a steel plant for the manufacture of their own steel. Opposite, and at the side of the engine-house, will be the boiler-house, 40 by 100 ft., in which will be set all the boilers for running their works. At the side of the finishing-shop will be located the foundry, a building 50 by 150 feet; and, adjoining it, in a separate building, machinery for cleaning their boxes, and store rooms for the boxes. Back of the foundry will be located a fire-proof building for storing patterns. Directly at the end of the finishing-shop, and removed about 75 ft., will be the store-room, a building 60 by 200 ft., with their offices in the second story. Besides the buildings named there will be the necessary sheds for the storing of iron, steel, lumber, etc. Their shops will be so arranged that handling will be reduced to the minimum, the iron and steel going direct from the rolling-mill to the forge-shop, where it will be cut, collared and forged into shape; and, at the end next to the machine-shop, the forgings will be inspected, trimmed, and go direct into the finishing-shop to the machines where they are turned up. The boxes coming from the foundry will work regularly through the finishing-shop and meet the forgings when they are turned and finished at the putting-up department, which will be at the end of the shop nearest the store room. There the axles will be inspected and put together and taken direct into the store-room, where they are packed for shipment. There will also be in the finishing-shop a tool-room, where the machine repairs are done and the tools are made and finished. The foundry will also have a department for making the necessary castings for the machinery repairs. They have now running at Auburn, machinery sufficient for finishing fully 600 sets per day of ten hours. They are running their machinery nights, and producing in the aggregate fully 1,000 sets in the 24 hours. This machinery they will not remove until such time as they feel safe in doing so without risk of interfering with the requirements of their trade, and they do not expect to be located in their new works fully until about next August or September, although they will start some of their machinery there as soon as the buildings can be completed. Their new buildings are now all under contract, and are being pushed forward as rapidly as possible. When their machinery is all located in their new plant they will have a capacity

of fully 1,600 finished axles per day of ten hours, and, by running night and day, can produce 2500 sets daily. This will form the largest and finest axle plant in the world, without exception, it being fully five times the capacity of any other in this country, and it will possess many advantages for manufacturing not only the finest class of goods, but for making them cheaply. The attention of manufacturers is being called more and more to the anthracite coal region as a favorable location for manufacturing, not only articles consisting of iron and steel, but others as well. The utilizing of culm for steam purposes reduces the cost of power to a minimum. The excellent facilities for transportation possessed by several points in that region--and WILKES-BARRE, we think, above all others--also make it desirable, and we would advise manufacturers who contemplate a removal of their works, to examine the ground there before they make a final decision.

THE SHELDON

From *Board of Trade Journal* Vol. 1 No. 4 October 1906 page 11.

The Sheldon Axle Company has one of the largest plants in our city, and is probably one of the least known to the people generally, for the reason that its business is of a character that does not bring it frequently to the attention of the public generally, at home while there is scarcely a part of the world to which it is not sending, more or less of its product, nor a hamlet in our own country in which it is not well and favorably known.

Its correspondence doubtless cover a wider field than that of any other of our city's industries, and takes the name of Wilkes-Barre more generally around the world, and into every nook and corner of this country.

The picture of the plant shown in this issue is reproduced from a large drawing made a short time ago, and is not at all overdrawn, as to the size of the buildings or space occupied by them in fact, does not give an adequate idea as to its actual size and importance as a manufacturing industry, 750 men finding employment and producing an output to the value of over one million dollars annually—the shipments for the year ending September 1st having been 300,000 sets of axles, and nearly 4.500 tons of springs.

The business was started about forty years ago, in Auburn, New York, where, for many years, the larger proportion of the work was done by convicts in Auburn State Prison. The growth of the business there compelled them to establish a plant of quite large dimensions outside of the prison, and, in 1886, on the abolishing of the contract system by the State of New York, the entire business was removed to this city, and the larger portion of the present plant was built.

In 1900 it was decided to add to the already large plant, a modern and fully-equipped spring plant, for which it was deemed possible that an output of 2,500 tons could be readily sold. This expectation has been more than realized, as the output of the past year has shown. This department has been a success from the start, a result due to the quality of the springs turned out, and the high reputation the company had gained with the trade for its axles.

There has also been added to the business the manufacture of the Empire ball-bearing axle, for which there is an increasing demand.

The officers of the company are: President. Edwin H.



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SHELDON AXLE CO.'S SPRING PLANTS AND ORGANIZATION.

It is just over a quarter century ago that the men who founded the Sheldon Axle Company, selected the present site and began operations. [moved to Wilkes-Barre in 1886 from Auburn, New York] ^{Hub March 1886.} Their intrepid belief in the undertaking is amply attested by the results obtained. The present management has been directing its policies during the past twelve years, and it is due to their precepts and ideals that the most intensive growth has taken place. Historically, this is, perhaps, as much as may interest the reader.

The management of the spring plants is in the hands of two groups of men; the one whose aims are production and handling of men and materials, and synchronizing one with the other; the second class is the engineering organization, whose work is to improve materials, methods, and to set the results of engineering investigation as the ideal to be approached by the mill. In few industries are the engineering and production heads in such close contact as here. Practice and theory have been made to coalesce to the advantage of both.

The Sheldon Axle Company's spring plants are situated in the city of Wilkes-Barre, in the State of Pennsylvania, occupying a total of fourteen acres, comprising manufacturing, experimental, shipping, office, testing laboratories and power buildings. The combined daily production of these plants is over three thousand springs, varying in weight from twelve pounds to three hundred pounds each. It requires from sixty to seventy-five tons of steel to furnish the raw material for a day's work of these plants. The transporting of such amounts of materials must needs be of a carefully planned arrangement, properly executed and working with dispatch and ease. An inspection of the half tone, showing a panoramic view of the plants, enables one to appreciate the above statement. The number of men employed is over twelve hundred. The best makers and largest producers of automobiles in this country receive their allotments from this source each working day in the year.

Raw materials, both steel and fuel, are near never has been a delay for want of either. Ample storage room insures against delinquency or miscalculation in this respect. The steel pits carrying the rolled bar stock contain over four million pounds, representing fifty sizes of spring widths and thicknesses. The handling of heavy materials, such as steel, naturally requires special appliances. Two overhead cranes take the raw material from the y freight cars, deposit it in the pits, from where it is further distributed to each operator by the same means.

In a plate spring each plate is a unit requiring, perhaps, different material, or a different process for its manufacture. A survey of the operations required in making a spring will give a better idea of the various stages needed to complete the whole element. Let us follow the receipt of your order.

The Filing Department receives, dates, indexes and passes it on to the Manager of the Spring Department. You are informed, at this stage, of its receipt. The Engineering Department

beginning with the Designing Engineer, calculate the various elements needed to make up the product. A copy of the design sheet is given to the Order Department, who make up the Mill Sheets, and these are passed to the Production Department.

Owing to the intricate nature of the processes in the Production Department, only a brief description can be given by elimination of those that seem of lesser importance.

The first step in the production is the shearing or cutting of the individual plates to predetermined lengths set by the Designing Engineers. From this stage the sheared plates go to the Forging Department, where a manifold number of operations begin to change the otherwise simple shapes. Here we have the punching, slotting, beading and sawing; also the tapering, pointing, swedging, trimming and eye bending. Each operation is performed by a special machine, and after each operation the plate is gauged and inspected. The half tones herewith give some idea of the multiplicity of operations and machines needed to produce these results. There is no guess work in any of these processes, nor in those following, they having all been predetermined by, the Engineering Department; indeed, this is true of all the Sheldon Axle Company's Mill processes.

The next step brings the plates to the Fitter's Bench. Here the plates are given their proper shape and set, and receive the first of the many processes that are called by the general term of heat treatment. This is the critical stage and a very serious one. Recording and indicating pyrometers, together with a complete semaphore system for indicating temperature, are used throughout the production departments. An inspecting engineer attached to the engineers' staff of the Metallurgical and Chemical Department continually watches the process during heat treatment. At this stage approximate tests are made for load carrying capacity and shape and reported to the Designing Department.

Next follow tempering and annealing processes, and toughness tests of the finished spring. A battery of endurance testing machines test springs to destruction. This test is relied upon to give the most definite answers to the question of the efficacy of all the processes of making the spring. When these steps are all completed, the spring is ground, finished, assembled, marked, and given a final test, then transferred to the Shipping Department. One point has so far been omitted in the description of the plants and organization. We feel that this should be stated in this closing paragraph. One factor is common to all departments, for which reason Sheldon springs have become famous. The aesthetic element, so often criticised as being absent in our American merchandise, must pervade in the finished goods. The artistic feature must be made a living issue of each spring. It is not considered "good enough," though all tests have been passed--it must possess distinction--it must bear all the handmarks of the masters of spring making. From: Leaf Springs: Their Characteristics and Methods of Specification... Edited by David Landau, Sheldon Axle Company, Wilkes-Barre, Pennsylvania, 1912.