

THE WORKSHOPS OF CLINTON, MASS.

"You will take the cars to Worcester, go from thence via the Worcester and Nashua railroad about thirteen miles to Clinton, and look at the workshops there. Some of the fabrics produced are in great demand, and the details will be interesting to our readers. Stop in Worcester a few minutes, if possible, and look in at the 'J. Washburn & Moen Wire Works,' then return and report to me."

So said the senior editor of the SCIENTIFIC AMERICAN to one of his associates a few days ago. Acting upon these instructions, we arrived at our destination in due course of time. What we saw in Worcester we shall tell our readers, privately, in another paper.

We found Clinton a flourishing town of some five thousand inhabitants, with as many churches, stores and hotels as are necessary, and several factories, some of them producing goods of a novel character. As our time was limited we went through only a part of them—the carpet factory, the Lancaster Mills, where ginghams are made, and the Clinton Wire Cloth Co.'s Works. In the Bigelow Carpet Co.'s Mills the most attractive sights were the piles of splendid Wilton and Brussels carpets. The variety in color and design was charming, while the ingenuity displayed in the construction of the looms which wove them was equally attractive. To attempt to describe the carpet power loom, invented by Mr. Bigelow, would be useless, therefore we shall not try. The yarn having been put into the loom and the pattern adjusted with it, the whole intricate and marvelous machine goes on and works out the beautiful design, reproducing in a tangible form the inspiration of the artist who made it.

A hasty run through the Lancaster Mills revealed the fact that they are very active, producing goods in great quantity and of excellent quality. We saw here the largest piece of flooring in one unbroken expanse to be found in the country; no less than *two acres* are covered with looms and young ladies. The goods made here are sold in advance of their production, so great is the demand for them.

From the Lancaster Mills we ran over to the works of the Clinton Wire Cloth Co., which are substantial buildings, plainly built and well adapted for the purpose. They are the largest in the world. It would be treading on dangerous ground to describe the machinery, as it was all constructed specially for the Company, comprising some of the largest and heaviest looms and other machinery we have ever seen. The goods made by this company are standard in quality, and much better than those produced by the old processes. Hundreds of different styles of cloth and nettings are manufactured, embracing all varieties that are made from iron, tin and zinc wires.

The reader will be surprised to learn of the extensive use of wire cloth in the arts and for domestic purposes. We have not, indeed, reached that pass where coats and vests can be made of it, but for some domestic uses it has become a necessity, while in the mechanic arts it is quite indispensable. We here refer to a few branches of the work that especially attracted our attention.

In one room was a huge roll of fine window screen cloth for protection against mosquitoes and other insect pests. We thought while examining it that it must be an immense satisfaction to sit in a brilliantly lighted room, protected by this gauze, on a summer evening, and know that in the outer darkness the mosquitoes and other winged annoyances were vainly dashing themselves against the iron-clad windows, seeking admittance and finding none, while the air came in as freely as though there was no interruption. Here also was another cloth to protect windows against unruly boys, and strong enough to resist the attacks of a madman; and, in striking contrast, a roll as light and airy in texture as a cobweb. On the other hand were yards and yards of cloth ready for the manufacturers to work into corn poppers, others for rat traps, both of which are made by the hundred thousand feet.

In the next mill was a roll of the most beautiful twilled cloth we have ever seen, almost rivalling the productions of Tiffany & Co. in fineness and its silvery brightness. These cloths are used in the manufacture of the small hemispherical strainers through which tea and coffee is strained. Many grades of

cloth are made for use in thrashing machines, fanning mills and other grain assorters. These have meshes mathematically perfect, and separate wheat from oats, rye, corn, peas and other foreign substances, leaving such as are required for the choicest brands of flour.

We were told that the wheat grown in different parts of the country cannot be screened by the same grades of cloth; Southern Ohio and Illinois requiring one grade, Wisconsin and Minnesota an entirely different one, Oregon and other sections still different grades and meshes. Each of the different seeds and grains require special forms of mesh; all of them are made here in the greatest perfection.

Among the heaviest articles fabricated by this company are the locomotive bonnet nettings, for covering the tops of the smoke stacks of locomotives, allowing the smoke to escape but retaining the sparks and cinders. These cloths are intended to embrace everything needed, running from very fine for wood burners, to the coarsest and heaviest "crimped" cloths for the coal burners. Crimped cloths are so called from the fact that the wire being cold drawn, goes through a peculiar process of bending or crimping before being worked in the looms. The patent for the manufacture of this class of goods is owned by this company. The greatest quantity of flour or meal sieve cloth, for domestic use, is made both from annealed and tin-plated wire. Formerly, these goods were bought by the sieve makers in the roll, and by them cut into squares to suit themselves; now, the cloth is cut at the factory by dies into circular forms of exact diameters, and is thus sold to the makers. By this system all the sieves of the country will soon be of the same size. This same grade of cloth is used extensively in the Western States for provision safes.

Neither time nor space will allow us to refer to all we saw in the factory, but we cannot refrain from mentioning the copper-plated cloth for cleaning cotton, and the galvanized cloth for drying wools; they are coming into general use. The galvanized wire fencing, with its neat and tasty hexagonal design, adapted to fencing in lawns, gardens and deer parks, and also for sections of country where timber is scarce. All this and much more we noticed as we wandered from room to room, and saw how deftly the huge machines caught the wires and put them into place, stopping themselves when a single one was broken, and how easily they were put in motion again when adjusted.

Although this company own all the machinery of the kind in the world, still they do not attempt to monopolize the business. They offer the hand weaver better cloths at prices as low as he can produce them, and sell the manufacturer and hardware dealer at a good margin for profit. The company do not make up any goods, but sell in the piece.

In passing through these works we were pleased to note a peculiarity which we wish was more common; everything here moved with the precision of clock work; everything seemed to have a place and to be in its place.

THE BRITISH MINT.

From the earliest times, and among nearly all nations, gold and silver have been adopted as the most convenient form of money. And though, in more than one country, furs have been employed for the same purpose, and in one cube of hard-pressed tea, and though at this day shells form the currency in one part of Africa, and lumps of rock salt in another, yet the exception proves the rule that among all nations, ancient and modern, possessing any claim to civilization, the precious metals have been, in theory at least, the standard of value and the medium of exchange. The reason of this is tolerably obvious—gold and silver combining a greater number of the necessary qualifications than any other article of value. The material of which money is to be made should be one which every one desires to possess; and though widely distributed, the supply of it should be limited enough to maintain a high relative value, which should be as little subject as may be to variation. It should be as imperishable as possible, and readily divisible into small portions. Its bulk should be small and its value easily ascertained. Gold meets all these requirements, except the last, more perfectly than

any other substance, and silver in a not very inferior degree. In addition to all this, gold and silver are almost the only metals found in the metallic state, and when pure are always of the same quality.

The trouble of weighing the uncoined money, and the almost impossibility of testing its purity, must have rendered buying and selling a difficult matter. Both difficulties were overcome by the simple contrivance which gave a government guaranty for the weight and fineness of each piece. The process of coining was at first extremely rough, and the results were anything but artistic. A ball of metal of the required weight and value was placed on the die, which bore the device to be impressed on the coin. A punch was held in one hand against the back of the ball, and struck with a hammer held in the other, till, after repeated blows, the impression was sufficiently worked up. Only one side of the coin, therefore, bore a device; the rough, irregular mark of the punch being all the impression on the other side. The edges, too, were rough and lumpy. Gradually the punch itself came to bear a slight design, till at last another die, equally artistic with the first, took its place.

The present building was erected in 1810, and fitted up with the larger part of its existing machinery. It is situated on the north side of Tower Hill, and may be at once recognized not only by its size but by the soldiers who are always on guard in front of it, as at one of the royal palaces.

In the first room we enter, we may see, if fortunate, the process of melting and alloying. The gold comes in from the Bank in the form of ingots, bearing the name and stamp of the refiner—usually Messrs. Rothschilds'. These ingots weigh 16 lbs. each, and are worth about £800. Half a dozen of these (after having been carefully assayed), along with the proper quantity of alloy, *i. e.*, one part of copper to eleven parts of gold, are melted in each crucible; the crucible itself being made of a mixture of Stourbridge fire-clay and plumbago. When thoroughly melted together (which may be after an hour and a half or two hours in the furnace) the precious mixture is cast in iron molds into the shape of bars two or three feet long. These we may follow into the next room, and see gradually reduced, by repeated rollings, nearer and nearer to the thinness of the future coin. In the case of gold, where the utmost possible exactness is required, each bar (or strip, as it may now be called) has to undergo a more exact adjustment to the required dimensions, by being drawn between two fixed steel rollers, which are placed at precisely the correct distance from each other. The ease and exactness with which this powerful machinery works is truly admirable. It bears the maker's name, "H. Maudsley, 1816," and is still in perfect working order, and scarcely ever needs repairs. As the golden ribbons are turned out by this machine, they are cut into convenient lengths, and a blank coin is stamped out of each and carefully weighed, as a further test that the thickness is correct.

And now let us come into the "cutting-room," where, amid din and noise hardly less than in the "rolling-room," the blanks are being cut out one by one from the golden ribbons. One is reminded of cutting gun-wads from a sheet of pasteboard; and the ribbons, when all the possible blanks have been punched out of them, look like the same sheets of pasteboard when used up, though they are a trifle more valuable! The punches are of course worked by machinery, and there may be a dozen or more of them, incessantly going up and down with almost resistless force, each being a sort of refined edition of the engine which every one must have seen for cutting out rivet-holes in boiler-plates. By the side of each sits a workman with his strip of gold ribbon, out of which he lets the descending punch cut, one by one, as many blanks as there is room for. After we have watched the process for a minute or two, we begin to wonder what check is kept on the workmen to prevent their appropriating a stray blank or two out of the heaps which are lying about in such profusion and confusion. On inquiry we learn that the exact weight of ribbon given to each man is set down; and that not one of the men can leave the room till the weight of the blanks returned, *plus* that of the ribbon waste, is found to tally exactly