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THE SCIENTIFIC AMERICAN SUPPLEMENT,

No. 497,

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COTTON GINNING IMPROVEMENTS NEEDED.

There are now in the United States between twelve and thirteen million cotton spindles, the property invested amounts to hundreds of millions of dollars, and the product each year runs nearly into billions. Seven-eighths of the cotton spindles of the country are subject to all the inaccuracies incident to the original cotton gin of Whitney, and the other eighth is only exempt from these troubles by reason of their using the Sea Island cotton, which is longer and finer than the Upland or short staple varieties.

The competition between the various cotton spinning and weaving concerns demands the greatest production with the least waste. Curiously, cotton has grown steadily worse in quality ever since the war. Many causes have operated to produce this result, but it is principally due to the constantly diminishing acreage of the individual planters, who, instead of raising five hundred to two thousand bales each, now put into the market anywhere from three bales upward, fifty to one hundred bales being considered a large output. With our larger cotton spinning establishments, some of which work two or three hundred bales of cotton per week, the large number of different growings of cotton leads to peculiar results in the mill, which are shown by diminished production, owing to the mutilated and varying length of the fiber.

The ginning of cotton is apparently a very simple affair, but in reality it is not, and old ginnery hands are in demand at exceptionally high wages all through the cotton growing States. An additional difficulty results from the changing in many mills making finer sheetings and shirtings, to numbers finer than they had previously been spinning. This has called for a longer staple, and has led the planters to the growing of what is now termed "fine cottons," which are both longer and finer in their length. The culture of this cotton would be vastly more profitable could it be carried on to any great extent; but the usual process of ginning the Sea Island is very slow and tedious, and the common saw gin is entirely inadequate to properly gin these fine cottons. There seems, then, to be a very evident want of new ginning machinery for the "fine cotton," which necessitates a different application of mechanism from anything now in the market. The new gin must treat a longer fiber of cotton or "lint" than the saw gin is capable of handling, for in the latter the fiber must not be of a length much to exceed the distance between two saws, otherwise it is carried lengthwise across the breast of the gin and is mutilated by the teeth of the saw. Something which will obviate this difficulty would find a very large market at almost any price within reason. "Lint" coming from such a gin would find ready sale at considerably increased prices among the spinners, for the better grades of yarns and the finer classes of goods. This question is one for mechanical solution, and a considerable knowledge of the requirements of the cotton trade is necessary in order to handle it successfully.

There is a decided tendency to improvement in this respect, which is shown by the increasing number of patents taken out every year for improved methods for making cleaner lint or fiber, but it seems that quantity has perhaps been carried too far; while the mechanism has not been improved to any great amount, so that a machine is now called for which shall avoid the mutilation of these small fibers, which, when two or three hundred are pressed on the teeth of a saw, can hardly escape injury. When these fibers come to the spinning mills, the injury works decidedly to the spinner's disadvantage, in the very largely increased waste of these mutilated fibers and in a lack of strength, evenness, or regularity in the thread after it has been spun, and the trouble only ends when the cloth is finished.

Cotton may be materially injured by running the gin either too fast or too slow, but very little injury from the latter cause has ever been found when the cotton has been carefully examined after ginning. Most of it shows very clearly the harm that arises from crowding the gin, or attempting to do more than can properly be done by a gin of a certain number of saws. Another cause, and one of those to which attention should be most directed, is attempting to gin the cotton when it has been taken from the field before it is completely matured or when a considerable amount of moisture is present, so that it is damp to the touch; very great injury frequently comes from cotton which has been ginned in this condition.

The question of the proper ginning of cotton is one which is now before the cotton world. Some of the largest dealers have recently taken this matter in hand with a view of eliciting all the information possible. This question was considered so important some years since that very extensive trials were made in England and in India with a view to ascertain not only what different gins *could* do, but what they *did* do in regular working, in charge of those who attended to the ginning of different cottons from year to year, and a vast amount of information was obtained; but much of the machinery which was used in those trials, ten to thirteen years since, is now obsolete, which shows some activity in this direction. But American spinners and planters are now interested to obtain information regarding what is being done to-day, and are waiting for the appearance of an improved gin. This is a question for mechanics and inventors to solve, and there is without doubt a very large sale for a cotton gin which can accomplish a reasonable amount of output with the minimum amount of injury to the individual fibers, so that the spinner shall obtain cotton of greater value, greater strength in the manufactured product, and less waste and consequent loss in its manipulation.

EDGING BY FORGING.

In a forging shop recently the smith was dressing some cold chisels and some lathe tools. It was noticed that, by the help of his assistant, after drawing the tool to an edge, he cut off the very edges before hardening and tempering the tool. After observation showed that he had left an edge thickness of not less than one-sixteenth of an inch, somewhat more. The smith was an old workman, verging on being an old man; so he was asked the "reason why." In answer he took a bar of tool steel, heated and forged it, and made a chisel point. Then he hardened it, as usual, in clean water, scoured it, and drew it to a pigeon blue temper. A slight tap with a hammer drove the edge off as though it had been glass. He explained that good, high steel could not be hardened and tempered when drawn to a thin edge: that there was not material enough left in a fine edge to sustain an edge after hardening and maintain an edge after tempering. His plan was to harden and temper the solid metal and grind to an edge. Possibly his method was adapted only to "high" steel; and yet it is indisputable that when tools are forged to edge and hardened they frequently crumble until they have been ground and worn far below the forged edge.

There are steels that will take a cutting edge without fire and water hardening. Wood working tools, as plane irons, can be hammered to temper without ever touching water; but usually tool steel is amenable to treatment for cutting purposes only by fire and water. Sometimes it is necessary to dress tools to shape by the file, and in that case the tempering must be the finishing.

An instance may be related. It was necessary to make some miniature bobbins to hold flattened gilt wire to be spun around a core of silk thread, producing a gold yarn or thread for embroidery and braiding purposes. The bobbins were made of boxwood, and were so small that three of them would not weigh an ounce. They were run with great rapidity and needed to be exactly balanced, as they revolved around a central spindle. The tools for finishing these bobbins were of necessity made to accurate gauge, and after hardening and tempering could not be touched except to "finger stone" them to a polished edge. These tools were heated in the usual way, but instead of being plunged in water, were pushed through a cake of common beeswax on the top of a can of oil in which they were cooled. They required no tempering.

A mixture of beeswax and hard soap is handy for tempering small tools, or those that must be brought to edge as well as shape before being tempered. If the steel is good and has been properly handled, not overheated by the smith, very satisfactory results can be secured even when the tool is fairly edged down; and no after drawing to color will be required. But it is best, in ordinary work, to grind back from the hardened edge of any common machinist tool. A hammered edge—"cold tempered"—is a delusion; it will not stand for anything. Even in stone drilling it has been proved that those drills and chisels are best which are ground after the hammering. This is contrary to the old fashioned notion, but it is really fact; a ground and polished edge is better than any that can be given by hammer, fire, and water.

PROFESSOR FLEEMING JENKIN, LL.D., F.R.S.

The announcement of the death of Prof. Fleeming Jenkin, of the University of Edinburgh, which took place on the 12th ult., has been received with profound regret by the entire scientific world.

Prof. Jenkin was but little over 52 years of age, and was in the very prime of his power. His education was obtained chiefly on the Continent, his degree of Master of Arts being awarded to him by the University of Genoa in 1850. For several years after his graduation he was employed in locomotive and constructive engineering, but at a comparatively early age he became deeply interested in submarine cables and general telegraphy, a department in which he afterward achieved such signal distinction. He was connected with the laying of the first American cable, with various European and Asiatic cables, and almost his last professional work was done as one of the joint engineers to the Mackey-Bennett Cable Co. He was retained by the Government as professional adviser in testing the cables taken over under the Postal Telegraphs Act.

In 1865 Prof. Jenkin was called to the Chair of Engineering in University College, London, and three years later he was appointed to a similar chair at the University of Edinburgh. As a teacher he met with the same success which had attended his engineering