

THE
Scientific American,
PUBLISHED WEEKLY

At 128 Fulton street, N. Y. (Sun Buildings.)
BY MUNN & CO.

O. D. MUNN, S. H. WALES, A. E. BMAOH.

Responsible Agents may also be found in all the principal cities and towns in the United States.

Sampson Low, Son & Co., the American Booksellers, 47 Ludgate Hill, London, Eng., are the English Agents to receive subscriptions for the Scientific American.

Single copies of the paper are on sale at the office of publication and at all the periodical stores in this city, Brooklyn, and Jersey City.

TERMS—\$2 a year.—\$1 in advance and the remainder in six months.

See Prospectus on last page. No Traveling Agents employed.

Improved Roller Gin.

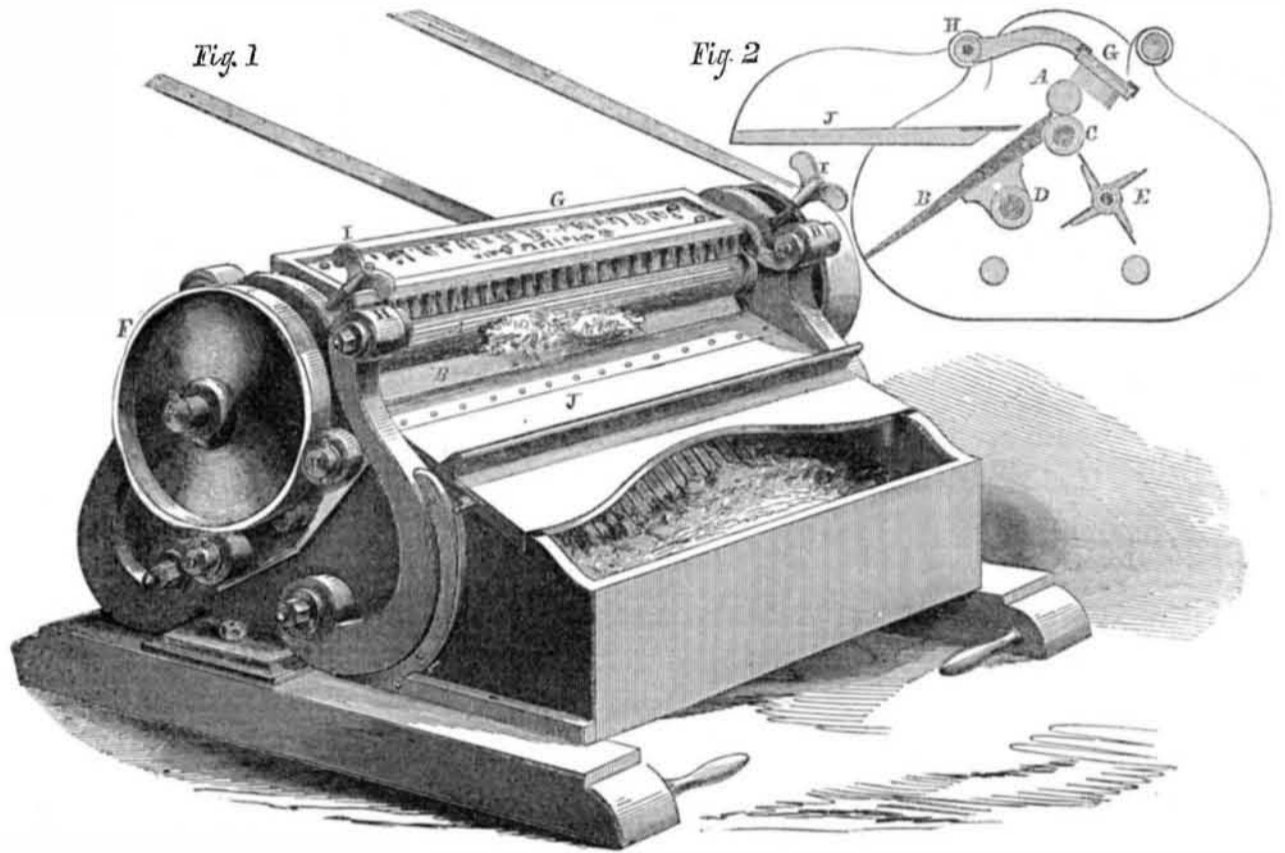
Some of the finest threads ever spun were of cotton. The sizes in common use in the manufacture of cloths vary from about No. 30 to No. 80, the higher number being the finest; but in the report of the great Exhibition of 1851, we find notices of yarns exhibited by one British manufacturer of numbers 200, 400 and 600. Another exhibited a sample of yarn, which, measured by the same standard, would be numbered 900. And the very finest, a thread so extremely small that it would require 167 miles to weigh one pound, would number, by the same gauge, over 5,000. There were no silk or linen threads that would compete with these.

The finest cotton yarns ever made were spun by native artists in India, but the fineness is not uniform. Modern cotton machinery produces a thread of greater average fineness, though not as small as some individual points.

Cotton has been raised in China since the thirteenth century; but the Sea Island, or black seed cotton of our country, the finest and most valued cotton used by civilized nations, was imported from Jamaica and Pernambuco, in 1786, and its culture was fairly established in the three succeeding years. The length of its fiber, and more especially its fineness and peculiarly delicate character, makes it unfit for ginning or separating from the seeds, in the ordinary manner—tearing it by saws—and the machine still in vogue for ginning this material, consists simply of two small rollers of wood. The first gins ever used, even on upland or short-staple cotton, were on a similar principle. The rollers catch the fibers and draw them forcibly through, while the seeds are excluded on account of their size. To make the angle sufficiently great, however, to repel the seed, it is necessary to make the rollers very small in diameter; and the amount of ordinary cotton ginned by one man or woman before the invention of Whitney's saw gin, was only about eight pounds per day. The long-staple is better adapted to this mode of ginning; still an operator without horse power will gin but about twenty-five pounds per day; and with all the power which can be desired, the action is very slow.

Many efforts have been made to invent rapid gins for Sea Island cotton. One planter is reported to have expended \$5,000 in experiments, and many inventions have been attempted by others with little better success. The great merit of the roller gin is the perfection of the product; it does not rub or damage the staple. The action on the fiber is a simple grasping and pulling. Few of the substitutes have been equally simple in their action; or if so, few or none have seized the fiber with equally soft fingers. Metallic rollers, pressed together with sufficient force to seize the fine filaments, crush and destroy their texture. The material of the old fashioned rollers is hickory wood, the diameter is but seven-eighths of an inch, and as a consequence, bearings must be provided at intervals of only from 8 to 12 inches, else the rollers would spring apart and allow the entrance and

CHICHESTER'S ROLLER GIN.



crushing of the seeds. The difficulties incident to the use of these gins are quite numerous, not the least of which is the very serious tendency to take fire from friction; and the bearings are almost invariably changed to charcoal in a very short time.

The machine represented in the accompanying engravings, Figs. 1 and 2, is the invention of Mr. L. S. Chichester, and was patented on February 3rd, of the present year. It is a roller gin. One roller is steel, the other is iron covered with firm vulcanised india rubber. The surface of the latter gives exactly the desired action on the fiber, but would be very ill-suited to resist seeds. A separate plate, therefore, is provided, the edge of which is near the bite of the rollers, and the seeds, while being stripped, lie in the angle, not between the rollers, but between this plate and the upper roller. By slightly curving upwards the edge of the plate, a much greater angle is made to repel the seed than is secured even by the use of much smaller rollers, in the ordinary manner. To facilitate the action, a slight but rapid movement is given to the plate by a device, which will be described below.

Fig. 1 is a perspective view, and Fig. 2 a section of Mr. Chichester's gin. A represents a steel roller, about 20 inches long, between the bearings, and about one and a quarter inches in diameter. B represents the plate described, and C the india-rubber roller, three inches in diameter. The plate, B, is rigidly fixed upon a shaft, D. On one end of this shaft, D, outside the frame, is mounted a cross-piece, as represented, on which are two rollers D' D'. A wheel, F, mounted on the shaft of C, is slightly scolloped, or cam-shaped, on its periphery, as will be observed on close inspection; and these successive elevations and depressions acting on the two rollers, D' D', give to the shaft D, and consequently to the plate B, a very rapid and positive vibrating motion, to the extent of nearly one-eighth of an inch at the acting edge. E is a small fan-wheel, which serves to remove any of the fibers which might adhere to C, and G is a stiff brush hinged to the points H, which serves also to strip the roller A. I, I, are thumb-screws, which serve to

drive A down upon C with any required degree of pressure. J is a table or feeding-board, on which the cotton to be ginned is placed. A sufficient space is left between the edge of J and the face of B, to allow the seed to drop through and escape. The roller A is driven simply by "rolling contact" with C, and consequently there can be no difference in the velocity of their surfaces. The upper curved edge of the plate B, is about three-eighths of an inch from the bite, or point of contact, of the rollers. On first being pushed forward, the loose fibers of the cotton are drawn through by a simple contact with A, until they are caught by the bite and carefully separated from the seed with just sufficient violence to keep the latter continually turning, an operation which is materially aided by the vibratory movement of B. To increase the effect of the rollers in pulling the fibers, the surface of A is fluted, as represented in Fig. 1; but the flutings, and, in short, all parts of its acting surface, are kept very highly polished or burnished. This machine has ginned at the rate of 10 pounds per hour, the cotton, as may be supposed, not only possessing the character, but presenting the appearance of having been cleaned by the ordinary roller gin. The appearance of the fiber when exhibited in the market, is at present a matter of great commercial importance, as the purchasers are mainly in England and France, and are prejudiced against new inventions for this purpose, as they have found the product generally inferior.

There are no extraordinary difficulties connected with the raising of Sea Island cotton, except the increased trouble of picking and ginning it. Its pods or bolls are smaller than those of the ordinary Mexican, or short staple-cotton; but the main difficulty, as before observed, lies in the ginning. If this or any other gin is completely successful, the price of the goods may be cheapened, and the production of fine cotton very much increased. The growth of this plant, originally confined to a few islands on the coast of South Carolina and Georgia, has now been found to succeed over a very large tract of country, including nearly or quite the whole of Florida. Although

partial to sea air, and probably to the employment of salt mud, rushes, &c., as a dressing, it is now raised with profit, under all its disadvantages, at points 150 miles from the sea. Mr. Chichester's gin is pronounced by parties familiar with this material, to be the best yet produced. It certainly appears to us the best within our knowledge. We have seen it in operation, ginning the finest varieties, worth one dollar or more per pound, with great rapidity, and performing the operation in a manner absolutely perfect.

For further particulars, address:—"The Union Roller Cotton Gin Co., No. 6 Liberty-street, New-York."

Nature the Teacher.

Hugh Miller says, in his last great work, "The Testimony of the Rocks," that there is scarce an architectural ornament of the Gothic or Grecian styles which may not be found as fossils existing in the rocks. The Illudendron, says Mr. Miller, was sculptured into gracefully arranged rows of pointed and closely imbricated leaves, similar to those into which the Roman architects fretted the torus of the Corinthian order. The Sigittaria were fluted columns, ornately carved in the line of channeled flutes; the Lepidodendra bore, according to their species, sculptured scales, or lozenges, or egg-like hollows, set in a sort of frame, and relieved into knobs and furrows; all of them furnishing examples of a delicate diaper work, like that so admired in our more ornate Gothic buildings, such as Westminster Abbey, or Canterbury and Chichester Cathedrals, only far more exquisite in their design and finish. No one can rise from the perusal of Mr. Miller's volume, without feeling convinced that it is one of the most interesting and erudite contributions to scientific literature of modern times.

Niagara Suspension Bridge.

This bridge appears to be a profitable concern. During the past year, ending April, the report of the company, recently published, states that the revenue amounted to \$41,963, disbursements, \$4,507, thus showing that the working-expenses are but small. The dividend which it pays averages 15 per cent.

