

THE INVENTION OF THE SEWING MACHINE.

BY THE ENGLISH CORRESPONDENT OF THE SCIENTIFIC AMERICAN.

An attempt was made as far back as 1775 to accelerate hand sewing, which is limited to about forty stitches per minute, by the patent needle invented by C. F. Weisenthal. This needle, instead of having the eye for the thread at one end and the point at the opposite extremity, as is the practice in the existing hand-sewing needle, was pointed at both ends, and had the eye in the center. With this needle it was not necessary to turn the needle over when sewing. Strange to relate, this system has been adopted in some sewing machines, the needles being pulled and pushed over by the aid of mechanical pincers.

The first practical sewing machine, however, was invented in 1790 by Thomas Saint, a cabinet maker, of London. It is not known whether he ever built a practical machine. But he compiled a very comprehensive specification and set of drawings, and patented his machine. It may be seen from our illustration of Saint's machine, which was constructed several years ago from the inventor's designs, that many of its features are present in the modern types of sewing machines. The Saint machine is of the chain-stitch, or single-thread, type. It consists of a table with an overhanging arm, which feature it will be observed is retained in the modern sewing machines, and a horizontal shaft. The latter, through the medium of a ratchet wheel, reciprocates a vertical needle bar. The machine appears to have been intended chiefly for leather work. It was provided with an awl working vertically, which pierced a hole for the thread. A spindle and projection laid the thread over this hole, and a descending forked needle pressed a loop of thread through it. The loop was caught on the underside by a reciprocating hook; a feed moved the work forward the extent of one stitch, and a second loop was formed by the same motions as the first. It descended, however, within the first, which was thrown off by the hook as it caught the second, and being thus secured and tightened up, an ordinary tambour or chain stitch was formed. Saint, however, apparently did not proceed with the development of his sewing machine idea, for a few years later he devoted his energies to steam boilers. It was not till some forty years after Saint had obtained his patent, in 1790, that any decided attempt was again made. In 1830, Barthélemy Thimonier, a tailor of St. Etienne, in France, patented his device, and he followed it up with great assiduity.

In Thimonier's apparatus the needle was crocheted, and descending through the cloth, it brought with it a

loop of thread, which it carried through the previously made loop, and thus it formed a chain on the upper surface of the fabric. The machine was a rather clumsy affair, made principally of wood. As many as eighty were being used in Paris in 1841, making army clothing. Hostility to the invention was great, and an ignorant and furious crowd wrecked the establishment, and nearly killed the unfortunate inventor. Thimonier, however, was not discouraged, for in 1845 he twice patented improvements on it, and in 1848 he obtained both in France and the United Kingdom patents for further improvements. The machine was then made entirely of metal, and was a great improvement on the wooden model. But the revolution of 1848 blasted his prospects, and he died in obscurity in 1857.

The eye-pointed needle and a double thread or lock-stitch were invented by Walter Hunt, of New York,

metal baster plate, which can be bent to the curve of the seam to be sewed. The baster plate is drawn through the machine by the teeth of a pinion, the motion being intermittent, and thus carries the cloth forward in front of the needle.

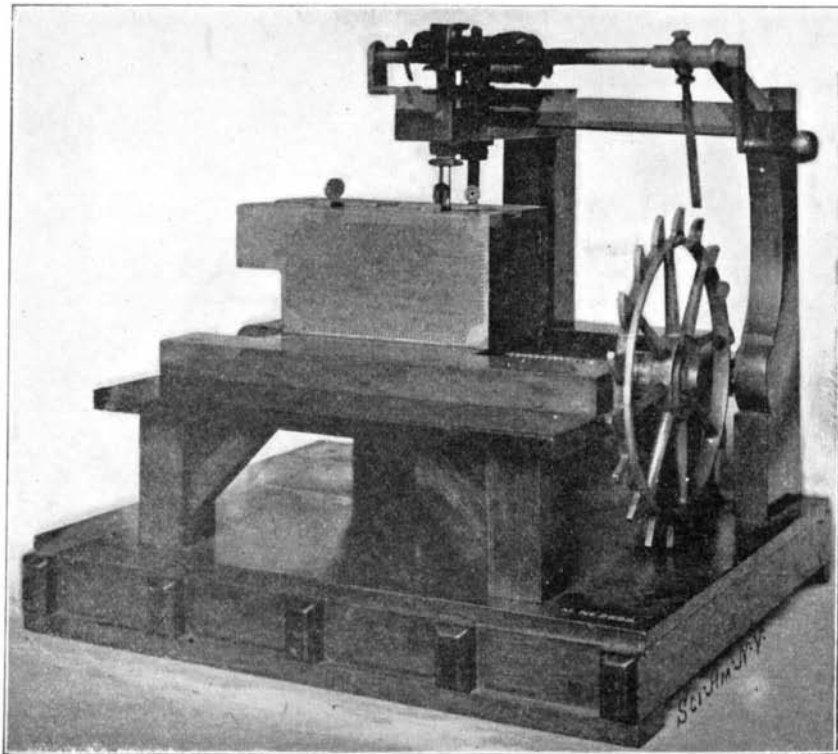
The needle is curved, and the eye is placed near its point. The thread passes from a spool above, and down through the eye. The needle is attached to a pendent vibrating lever, and when the point has passed through the cloth a certain distance, and is just returning, a shuttle, containing a bobbin of thread, sliding in a shuttle race, passes through the loop that extends from the cloth to the eye of the needle, leaving the shuttle-thread in the loop. The needle then rises, and both threads are pulled taut, with the needle thread in front of the cloth, and the shuttle-thread behind, but both threads cross in each hole made by the needle. Although the needle swings in a vertical plane, it

passes through the cloth horizontally. The shuttle travels to and fro horizontally with the point, or nose downward, being driven from end to end of race by two strikers which are operated by arms and cams secured to the main shaft.

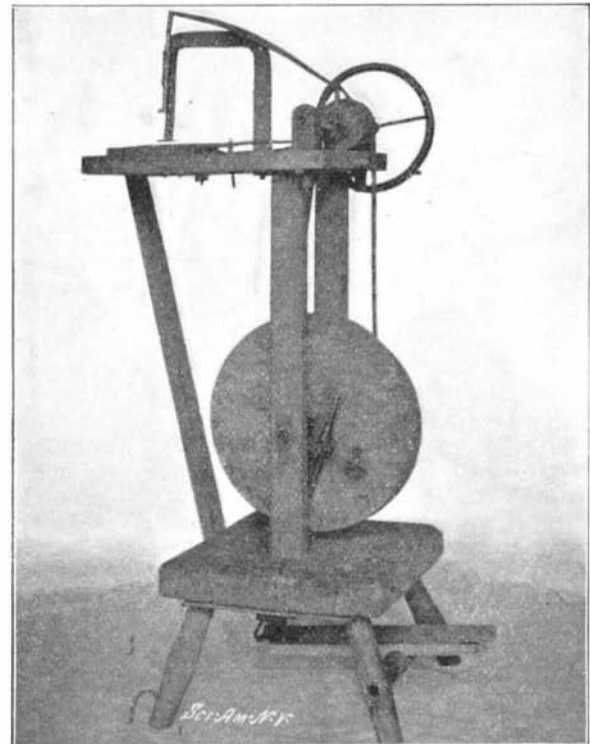
As will be seen, this machine bears but little resemblance to any of the modern machines, but it embodied the three essential features which characterize almost all practical machines, viz., a groove needle with the eye at the point, a shuttle operating on the opposite side of the cloth from the needle to form a lock stitch, and an automatic feed.

But although the foregoing men are accepted as the pioneers of the sewing machine, an interesting relic, a home-made amateurish sewing machine, is now preserved in England. It is a most primitive apparatus, constructed for the most part of wood. It was made by Charles Kyte, a native

of Snow Hill, near Evesham. The date of its origin is unknown, though it may have been made before the birth of either Saint's, Thimonier's, or Howe's ideas. The machine consists of a four-legged wooden stool supporting a table upon which the machine itself is carried. The treadle serves to actuate the machine by means of a cranked axle carrying a wooden flywheel, weighted near the circumference by lead run into bored holes. On the spindle of the machine is a small pulley driven by a belt from another pulley on the flywheel, while a crank in the spindle imparts the vertical reciprocating motion to the needle bar through a long rocking lever. To the side of the upper pulley is fixed an eccentric steel ring which acts as a cam, and gives motion to a long arm which works the shuttle-carrier. On the opposite side of the crank working the needle bar is a small cam giving a side motion to a horizontal rocking lever feeding forward the work to be sewn. On the table is a light flat spring, fitted with a small



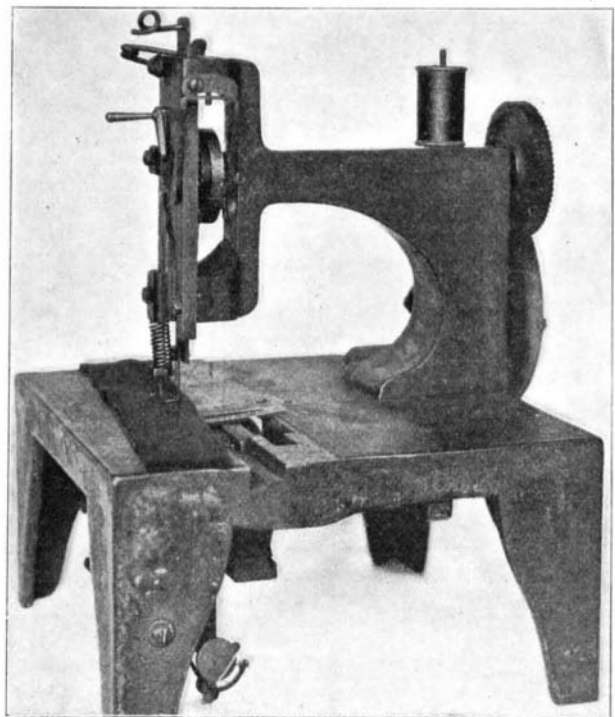
Sewing Machine Invented in 1790 by Thomas Saint of London.



English Sewing Machine Built in the Early Part of the Nineteenth Century.



Elias Howe's Sewing Machine, Built in 1846.



First Singer Sewing Machine, Made in 1851.

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in 1832 to 1835, and by this needle a loop of thread was formed under the cloth to be sewed, and through that loop an oscillating shuttle was passed, thus making the lock stitch of all ordinary two-thread machines. Hunt really produced a practical machine, but he failed to protect himself until 1853, when his claim to a patent was disallowed on the ground of abandonment.

Elias Howe first commenced work on the sewing machine in 1844, and in 1845 he made a thoroughly successful machine, and in the next year he obtained a patent, which was to bring him wealth, for in 1863 his royalties were \$4,000 a day.

Our illustration shows the first successful machine invented by Howe, and it differs from both Saint's and Thimonier's inventions in almost every particular. It was of the lock-stitch type, and the work to be sewed, instead of lying horizontally, hangs vertically, being fixed on pins embedded in the edge of a thin

pulley, and this appears to have been used as a tension. Unfortunately, the needle and shuttle of this curiosity are missing, and their form is unknown.

In 1851 the Singer machine was invented. Like the Howe, this latest device was of the lock-stitch type, and the shuttle works transversely by a carrier having a V-shaped slot on its side, in which a crank pin attached to the underneath shaft moves. A crank pin on the upper shaft, working in a V-shaped slot in the needle bar, supplies the needle motion. The needle thread tension is adjusted by altering the extent to which the thread is coiled round a smooth wire, and the thread is held at the commencement of the down stroke by an additional tension applied by a cam at the back of the crank plate. It has a wheel-type feed, the feed wheel being moved intermittently by a band, worked by a rocking lever from a cam on the underneath shaft, sufficient friction to obviate the backward motion of the feed wheel during the return of the band being given by means of a wooden brake block.

THE PHONOGRAPH AND HOW IT FIGURED IN THE TREATY OF JOLO.

BY E. C. ROST.

Just half way round the world from Washington, D. C., to the extreme south of our Philippine possessions, lies a group comprising eleven small islands, all of which are inhabited, together with many adjacent smaller islands, some of which have never been explored. At present the attention of the civilized world is being drawn to Jolo, the largest island of the group, because of an insurrection on the part of the natives against the United States government. The treaty made with Gen. Bates in 1899 will be remembered as one of the most remarkable in the annals of history. Without the loss of a single life, a compact was entered into with the rulers of the different islands, who represented a million and a half of people, and that without the cognizance of the Sultan of Jolo, whose jurisdiction was supposed to extend throughout the entire group. Thus forced to see the futility of withstanding the United States government, he also finally agreed to the conditions of the treaty.

The city of Jolo, on the island of like name, is the American capital. Maibun, on the opposite side of the island, is the Moro seat of government. These Moros represent the true Indian type. They are semi-civilized, and very treacherous. Of piratical tendencies, their territory, even to the present day, is regarded with dread. They never eat meat, but subsist upon a diet of rice, fish, fruit, and vegetables, and yet withal are perfect types physically. Both sexes wear a trouser-like garment, that affected by the man fitting skin tight. I asked a Moro how he got in and out of the clothes, and he replied that they were sewed on and never removed until they fell off. Polygamy is universally practised, and slavery exists very extensively. Horse stealing is punishable by death; murder by a fine of about fifty dollars. The religion is Mohammedan, and as practised on the islands gives rise to many queer customs. For example, a Moro without any previous preparation for the calling will suddenly declare himself "juramentado," that is, inspired by Mohammed to be a destroyer of Christians. He forthwith shaves his head and eyebrows, and goes forth to fulfill his mission.

Shortly after Gen. Bates' arrival on the island, the sultan sent word that there were some half dozen juramentados in Jolo over whom he had no control. The general replied, "Six hundred of my men have turned juramentado, and I have no control over them." Thus for the time being at least did the juramentado element cease to exist. Within the past few months, however, another juramentado has come to light. He succeeded in getting into the city of Jolo, where he seized a member of the 17th United States Infantry, and promptly disemboweled him. The murderer was caught in the act by a sentry on guard, who instantly dispatched him. Unfortunately, the bullet also killed a Moro, the chief bugler of the regiment. It was decided to make an example of the juramentado. Accordingly, a grave was dug without the walls of the city. Into this the murderer was unceremoniously dropped. A pig was then suspended by his hind legs above the grave, and the throat of the animal cut. Soon the body lay immersed in gore, the direst calamity that could happen to a Moro, his religion teaching him that contact with pig's blood means exclusion from heaven. A guard stood sentry over the grave until dusk, when the pig was buried side by side with the juramentado. This so enraged the Moros that they besieged the city. Matters became so grave that Gen. Wood felt called upon to disperse the mob, resulting in the death of a number of Moros. This uprising on the part of the natives entirely abrogates the conditions of the Bates treaty made in 1899 under the most diplomatic conditions. The general first visited each of the surrounding islands, and invited its chief on board the cruiser "Charleston," which the Navy Department had placed at his disposal. There the guest was treated to entertainment of a liquid nature, and incidentally

presented with a great sack containing one thousand Mexican dollars, in bulk as much as two men could carry. The manner of the presentation was most dramatic. As the bearers dropped their burden, the mouth of the bag opened as if by accident, and the coin rolled forth at the feet of the recipient. Before leaving the ship the visitor was prevailed upon to sign the treaty. Oftentimes we found it necessary to travel several miles inland in order to reach the chief. On these expeditions we went totally unarmed by order of Gen. Bates, who thereby showed great judgment. Trouble must have resulted on more than one occasion had we been provided with fire-arms.

Our interpreter was a white man, Edward Schuck by name. As a linguist he excels, speaking fully a dozen languages with great fluency.

At last there remained but the sultan himself to be interviewed. This proved to be a difficult matter, for upon hearing of the arrival of the vessel of war in the harbor of Jolo, the sultan promptly departed for Maibun. In vain representatives of Gen. Bates were sent on shore to request his royal presence on board. At last the "Charleston" sailed for Maibun. Once more the general's representatives went on shore to invite the sultan to the warship. Most positive was the refusal. A second invitation was treated in like manner. Weary of diplomacy, Gen. Bates sent, ordering the sultan to appear, and upon his ignoring of the command, the decks were cleared for action, aim was taken at the rocks alongshore, and the first discharge not only filled the air with flying rock, but it also sent the curious Moros, who had crowded to the shore in hundreds, rushing and screaming, as though bereft of their senses, into the shade of the forest beyond. It convinced the sultan, too, that he had better accompany the officers to the ship; and so, in company with his many retainers and a great show of pomp, he boarded one of his own war canoes, and was paddled to the "Charleston." Each visitor had taken the precaution to supply himself with a great sack of rice, under the weight of which he fairly staggered up the gang ladder. All had evidently come prepared to make a protracted stay. It is safe to say that the events which happened on board the "Charleston" during the next few hours will never be forgotten by those present. The royal guests were conducted over the man-of-war. Food they refused as coming from the hands of Christians, but drink they took freely. Great was their wonderment at the things which they saw. At the suggestion of an officer, the sultan touched an electric button; instantly a Chinese servant appeared as if by magic. Again, under directions, he operated the button, this time twice, and behold a United States marine stood in the doorway. From that time on, every ornament aboard ship that in any wise suggested an electrical button was pushed by the Sultan or some member of his suite. He was conducted into a dark room, and told to turn the button that adjusted the lighting apparatus. The flood of light that resulted left him with gaping mouth and dilated eyes. His wonderment continued to grow apace throughout the entire afternoon; whenever opportunity afforded, the Sultan of Sulu repeated the performance of pushing electric buttons and turning electric lights on and off. He even went so far, when he thought himself unwatched, as to try to appropriate one of the bulbs aglow with light. But the funniest thing of all was when the mighty chief, upon invitation, fired the Colt's automatic gun. The explosion of the first discharge seemed to root him to the spot. His hands still gripped the trigger, with the result that shells continued to pepper the surrounding waters. Again and again the royal gunner begged that they stop the action of the infernal machine, not knowing that the medium of cessation lay in his own hands; so thoroughly frightened was the sultan, it was impossible to make him loosen his hold, and an officer ordered the cutting of the tape, thus stopping the supply of ammunition. The one-pounder was next brought into play, and at the first loud boom the sultan called the ammunition display off, refusing to go near one of the eight-inch guns, which he had also been invited to fire. In the meantime his attendants, whose knives had been magnetized, conceived the idea that the Evil One himself was aboard. They begged and implored to be taken on shore, and quite forgetful of their bags of rice, they scurried down the gang ladder. At night the searchlight was brought to bear upon the Moro town of Bus Bus; the instant desertion of the town followed, even to the dogs, and for many weeks thereafter no amount of persuasion could induce the inhabitants to return.

Gen. Bates made his headquarters in the town of Jolo, and thither the sultan and his staff came on several occasions to discuss the treaty; subsequently another visit was made to the "Charleston." This time the mother of the sultan accompanied the party. A phonograph owned by one of the officers rendered very pleasing selections for the entertainment of the guests. The aged dame sat entranced throughout the

performance. It was not until the time came for her son to affix his signature to the treaty that she awakened. Under one condition only would she permit the sultan to sign—the phonograph must become hers at once. For a time that phonograph threatened to be the means of upsetting all of Gen. Bates' well-laid plans for the amicable taking over of the islands. Fortunately, the owner was prevailed upon to part with the machine in the interests of his government, and the coveted music producer changed owners at the signing of the treaty by the sultan.

The island covers fully three hundred and twenty square miles. It is of coral formation, and offers a most excellent harbor to the west. In topography it is gently undulating and covered throughout its entire length by the rankest tropical vegetation, valuable teak wood being found extensively throughout the entire district. Nowhere in the world are more luscious fruits produced. Among those peculiar to this belt is the durian, which is about the size of a muskmelon. Its exterior presents somewhat the appearance of a chestnut burr, being prickly and tough; within, the fruit is white and cheese-like, and owing to this peculiarity the American soldiers dubbed it the "vegetable limburger." The mangosteen is another of the rare fruits. It is the size of an average orange, chocolate colored, and has a very brittle skin. Inside, four white sections contain a colorless liquid. This is the rarest fruit known, and the only one, so it is claimed, that Queen Victoria had never tasted, there being no way of preserving the fruit for a sufficient period after plucking to permit of shipping to any distance. The hemp plant is also indigenous to these islands, the making of hemp being one of the chief occupations. In appearance the tree is just like the ordinary banana, a single hand of fruit growing forth from the top of the central stalk. The fruit is extremely bitter and is filled with numberless round, black seeds.

The origin of the town of Jolo does not lack in interest. Some fifty years ago an army officer, a man prominent in the politics of Spain, was exiled by order of the crown. His sentence doomed him to spend the rest of his life on this island in the Pacific. Being a man of great resource, he determined to lay out for himself a walled-in city. He accomplished his task after many years of arduous labor, and when his king heard of the manner in which the condemned man had spent his long period of servitude, he pardoned him. These very same walls we find to-day guarded by an American sentry. Just without the walls is the spear market, where all Moros desirous of entering the city proper are obliged to leave their weapons. This was a Spanish custom, and is enforced by the American authorities at the present day.

A 1905 International Exposition.

The one-hundredth anniversary of the exploration of the Oregon country by Capts. Meriwether Lewis and William Clark, of the United States army, will be celebrated by an international exposition, to be held at Portland, Oregon, 1905. Lewis and Clark were commissioned by President Jefferson. Their exploration added Oregon, Washington, Idaho, and parts of Montana and Wyoming to the national domain, and gave to the United States its first foothold on the Pacific Ocean. In 1850, the Oregon country had a population of but 13,294. In 1903 its population was 1,500,000. The exposition will afford an opportunity for studying the history, progress, sociology, and economic development of a section of our country that is comparatively little known to the East. Historically considered, for example, the acquisition of the Oregon country paved the way for the subsequent annexation of California. The cities of Portland, Seattle, Tacoma, and Spokane are examples of the progress of the region. Where Portland, with its 125,000 people and its annual jobbing trade of \$175,000,000, stands to-day, Capt. Clark in 1806 found a few miserable Indian huts. Puget Sound, which was little known for nearly forty years after Lewis and Clark returned to St. Louis, is now one of the world's greatest harbors.

A Ninety-Mile-an-Hour Automobile Speed Record.

Henry Ford, on January 12, with his remodeled racer, fitted with a new 70-horsepower motor, beat all existing records for the mile by a wide margin in a speed trial over a specially-prepared course on the ice of Lake St. Clair. A track several miles in length was prepared by scraping the snow off the ice and sprinkling it with cinders. The machine swerved and bumped about considerably, but made the remarkable time of 39 2-3 seconds.

A British Firing Record.

During the recent prize firing by the Channel fleet at Gibraltar H. M. S. Majestic, flying the flag of Vice-Admiral Lord Charles Beresford, made an astonishing record with her four 12-inch guns. She made 17 hits out of 23 for 37 rounds.