action it performs by a cam, T, (fig. 3) on the mandrel, C, which has a projection on it, that presses on the spring under bar, *k*, and forces up the tooth, *l*, while at the same time its front part acts on the back of ears, *i i*, and moves the feed bar forward towards the plane of the needle's motion. When the cam, T, ceases to act, the tooth, *l*, that catches and carries the cloth, drops down and the feed bar is pushed back for a new stitch, by the pressure of the spring, *n*, which is secured to one of the standards on the ears, *i i*. The length of stitch is regulated by an eccentric stop, *p*, which is pivoted on a pin, *q*, to the under side of the plate, Q; the feed bar is forced against the stop by spring, *n*.

The material to be sewed is placed on the top of plate, Q, under the pressing plate, *f*, and close up to the upturned part, *r*, which serves as a gauge to regulate the distance of the seam from the edge of the cloth. The thread from spool, P, is conducted through hole, *u*. near the end of the needle arm, and then through the eye of the needle near its point. The thread from the hollow plate bobbin, F, is passed through a slit between a small spring, *s*, and the edge of plate, Q, to the opening through which the needle passes; in this opening it plays freely. Its end is passed under a spring, *t*, which holds it, and the end of the thread from the needle is held by the attendant, and all is then ready to commence work.

When the mandrel is rotated, the descent of the needle arm forces the needle through the cloth, which carries the thread with it—the thread lying close to the needle behind and in front of it. When the needle commences to return or rise, the cloth offers a slight resistance to the return thread, which forms an opening; the rotating hook, *a*, comes round and catches it, carries it forward, and forms a loop. As the rotation of the hook continues it enlarges the loop, and that part of it which is on the front side of the hook, is drawn between the bobbin and the concave face of E, while that part of the loop behind the hook passes into the notch, *c*. The loop being extended by the rotation of the hook, the plate bobbin, F, in the concave of E, passes through it and on the next descent of the needle the loop is slipped over the chamfered part, *b*, of E, and drawn over the front of bobbin, F, between it and ring G, and thus it will be understood that as soon as one side of the loop passes on one side of the bobbin, and the other on the opposite side, the bobbin passes through it, and on its being drawn tight it locks the thread of the needle. Every second stitch is commenced before the previous one is completed, the extension of the loop for the second stitch drawing the first tight, and thus every stitch must be alike—not one slack and one tight as in some machines. The form of the rotating hook causes it to perform three beautiful and ingenious operations, namely: forming and throwing off a loop, and drawing the preceding one tight at the same time. While the needle is operated, the cloth is regularly fed forward by the feed bar described. There is a brake spring, applied to the spool, P, to give the needle thread its proper tension; and a piece of leather, applied to ring, G, produces the proper tension on the threads of the loops. The needle arm has a vibratory motion, and the length of needle stroke can be increased or diminished by a screw.

This machine is exceedingly neat and portable; it performs the finest quality of stitching, such as collars and shirt bosoms. One girl can stitch with one machine, 35 dozen of shirt collars in one day. There are 300 of these machines now in operation in various parts of the country, and the work which they perform cannot be surpassed. They can sew straight and curved seams; the stitches do not rip out, and from 1,000 to 1,500 stitches can be made in one minute by a good operator. One machine all complete occupies no more room than a small work table, and it is as ornamental as useful. The time must soon come when every private family that has much sewing to do, will have one of these neat and perfect machines; indeed, many private families have them now. Messrs. Wheeler, Wilson, & Co., have their office at No. 265 Broadway, this city, where these machines can always be seen in operation, and to see them is to admire their ingenuity of construction and excellence of action. The price of one all complete is $125; every machine is made under the eye of the inventor at the company's machine shop, Watertown, Conn., so that every one is warranted. As there has been much dispute about the originality and identity of sewing machines as related to Mr. Howe's original patent, no person who buys one of these machines is clogged with an impending prospective law suit, as there is an arrangement and perfect agreement between Mr. Howe and Messrs. Wheeler, Wilson, & Co.; so every customer will be perfectly protected. These machines are adapted to sew fine and coarse work; mens clothes or the finest collar stitching.

More information may be obtained by letter addressed to, or by calling at the office of the company.

Atmospheric Telegraph.

Suppose a line of two feet tube laid from Boston to New York, it would contain about 4,000,000 cubic feet of air. Suppose twenty pumps of ten feet diameter, and ten foot stroke are located at the Boston end, connected with the cylinder; these twenty pumps contain about 15,714 1-7 cubic feet. Suppose the pumps are worked twenty-strokes in a minute we have removed 314,285 2-7 cubic feet of air. Suppose the plunger was let in at New York at the commencement of operating the pumps, and the pumps continued to run, for fifteen minutes in which same rate 4,714,279 2-7 feet of air would be removed and the cylinder only containing 4,000,000, the plunger must reach Boston about as soon as this work could be performed so far as we can see, and the same result the other way. If the same number of pumps are worked at the same rate and for the same time, at New York allowing the plunger to be put in at Boston, when the pumps are set to work, and all the power used would be applied directly to moving the plunger and load; the air being removed from before the load no resistance could be had from it, and the power applied to the pumps is directly applied to drawing the plunger. And if the number are not sufficient to perform the work as fast as is necessary, more pumps may be added or of a larger calibre, this appears to be good theory, and so far as it has been tried, is good practice.

Electro Magnetic Steam Boiler Alarm.

We have received a communication from Wm. H. Lindsay, of this city, stating that the Steam Boiler Telegraph Alarm, which we saw in operation at the engineering works of Messrs. Pease & Murphy, of this city, and which we noticed in our columns, is described in a patent granted to him in 1849.

This patent Electro Magnetic Boiler Alarm, which we spoke of, is described in O. Byrne's recent work as the invention of Arthur Dunn, now a resident of England, and in whose name the recent patent for Ericsson's engine was taken out in London. He was formerly, we believe, a resident in this city, and has both an English and an American patent for the Electro-Magnetic Boiler Alarm. Mr. Lindsay's papers were filed in Washington, describing the Alarm on the 16th March, 1848; Arthur Dunn's were filed in England a month afterwards; the coincidence, somehow, is remarkable.

The New Light and New Motive Power.

We see, by nearly all of our English cotemporaries devoted to science and inventions, that they speak in high terms of the discovery of a Dr. Watson, whereby the electric light is rendered perfectly successful and economical, and by which, also, electro-magnetism will be economically applied to drive machinery and supersede steam. The whole of the economy of the new discovery of Dr. Watson lies in making useful products out of the materials employed to generate the electricity. At the present moment, for example, the sulphate of zinc is the product of employing zinc and sulphuric acid in the battery. Dr. Watson is going to employ lead as the metal, and the bichromate of potash as a fluid in the battery, which will produce the chromate of lead, a beautiful yellow pigment employed by painters. A company named the "Electric Power and Color Company," has been formed in London with a large capital, and a great establishment is to be erected in a short time to carry out the project.

We have no hope of the electric light or electro-motive power being so economical, for light on the one hand, or motive power on the other, as to supersede present modes of lighting, or the steam engine. The Electric Light is stated to be very splendid, not requiring air for burning, and that it will burn under water. The qualities which the light are said to possess, are no greater than those which our English friends spoke so highly of, as belonging to Staite's Electric Light, a few years ago, and which utterly failed, because of its great expense. We know that the useful materials—the chromate of lead—said to be produced by Dr. Watson's process, cannot make his plan so economical as to compete with gas light, or generate a power to compete with steam.

The Aztec Children.

These diminutive little specimens of an antique race (supposed to be) are on exhibition in this city, at the rooms of the Curioso, 629 Broadway. These curious specimens of the human race, described on page 133, Vol. 7 of the Scientific American, and the opinion of Horace Greeley of them may be found on page 184, same volume. Whether the Aztec children, which are on exhibition here, belong to a race nearly extinct, or are merely Indian dwarfs from Central America, is immaterial,—they are great curiosities and well worth seeing.

Changes in the Patent Office.

Saml. S. Shugart, formerly Assistant Clerk in the Patent Office, has been appointed Chief Clerk, in place of R. C. Weightman, removed Titian R. Peale, formerly Assistant Examiner, has been appointed a Chief Examiner. Mr. Peale has been a long time in the Patent Office, and is eminently qualified to perform the responsible duties of a Chief Examiner.

Apple Trees Killed with Potash.

Medicines in excess become poisonous. The "New England Farmer" mentions the case of an orchard of one hundred and sixty thrifty Baldwins that were washed with a solution of a pound of potash in a gallon of water. The owner found, in two days, that he had killed the whole of his beautiful and valuable trees. Soapsuds or ashes in water are strong enough. Guano is an excellent thing for trees, and salt is sometimes good; but it is one of the easiest things in the world to kill trees with them in excess.

Fall of Catfish.

The "Norfolk Argus" states that a curious phenomenon attended the hail storm in that city on Tuesday night. Quantities of catfish, some measuring a foot in length, fell in different sections of the city, and some of the fields were literally strewed with them.—Hundreds were picked up in the morning.—This, says the "Argus," is no piscatorial fabrication, but a fact which is attested by hundreds of citizens.

A new Mode of Ship Ventilation.

An iron ship named the "Evangeline," recently launched at Liverpool, has iron masts which are hollow cylinders, and which have trap doors at the lower end to open or shut at pleasure, for the ventilation of the vessel. It has been found that excellent ventilation is maintained by these masts even when the ship is stationary. This vessel has left Liverpool for New Orleans with a cargo of goods and passengers.

Comparative Health of Cities.

The report of the Board of Health of this city—New York—for the year 1852, shows an aggregate of 21,558 deaths, while the Philadelphia Board of Health, for the same year, gives, the total number of deaths in that city at 10,245. Thus, New York, with a population of 515,507, had one death to every 24 persons, and Philadelphia, with 409,000 inhabitants, had one death to every 40 persons. New York, however, has a large foreign population, among whom poverty and want breed sickness and death. The deaths, in New York, during the year 1852, of persons born in the United States amounted to 14,871, or one native in every 35 of the population. The greatest number of deaths was among the foreign Irish.

Improvement in Mills for Sawing.

An improvement in mills for sawing logs or lumber of any kind, has been invented by Henry S. Perrin, of Oxfordville, N. H., the arrangement of Mr. S. is substantially the following:—A semicircular or curved saw is hung in a rocking saw gate, rocking or turning on centres on the outside, a little below the centre of the saw sash. The pitman may be forked and take hold of arms projecting backwards from the sash, and hinged upon it, a little below the centres upon which it turns, or it may be attached in any other suitable manner, extending from it horizontally or in any other direction as may be desired. The pitman is hung in a bearing near its centre, and the lower portion slotted for the reception of a sliding box, within which the wrist of the driving crank turns. The log slides through the saw frame in the usual manner, It will be perceived that a great amount of friction is avoided by the above arrangement. The saw may be kept steady by a set of rollers, between which it turns in its cutting stroke, which will also prevent the saw from "running" or turning from its true course.

Improvement in Bedsteads.

A new method of attaching the parts of the common bedstead together, has been invented by Westley E. Merrill and Freeman Tupper, of Nashua, N. H. This method is simple as well as permanent, and recommends itself, also, for its cheapness. The rails are fastened to the posts by means of cast-iron clamps screwed upon each, which so interlock each other that a simple metal key, pressed down between the clamps, confine the rails and posts effectually together; the castings cost but a trifle, and they are very readily secured to the posts of the bedstead, ready for use. The manner in which the head and foot board are kept in their place is still more simple, nothing being required for each connection of the board and post but two castings or pieces of flat metal with a dovetailed groove cut upon the side of one, and a key upon the other corresponding to this groove. The parts being secured in their position by screws, all that is necessary to put them together, is to slide the board down to its required place, and the whole will then be firmly united. The canvas which covers the springs is also buttoned upon the side rails in a very convenient manner. The inventors have taken measures to secure a patent.

Improvements in Gun Locks.

An improved mode of constructing gun locks has been invented by P. F. Charpie, of Mount Vernon, Ohio, who has taken measures to secure a patent. The arrangement is a very simple and effective one, with hardly a possibility of failure, when in operation. The improvement consists in a new method of operating the hammer by means of the spring and trigger. The force of the spring is communicated to the hammer by a double or jointed stirrup attached to a pin passing through the hammer a short distance from the centre, upon which it turns as a fulcrum. The end of this lever, opposite the fulcrum, catches into notches formed on a small stationary block upon the bed plate, and in this manner secures the hammer at half cock or cock, as desired, when the hammer is brought to either of those positions.

Sash Fastener.

Benj. H. Bradley, of Cheshire, Conn., has invented an improvement on friction sash fasteners, for which he has taken measures to secore a patent. Mr. B. employs a sliding plunger, with a friction roller in the head surrounded by a spiral spring and placed within a barrel, the whole being inserted in the sash of the window, the rollers (one being used upon each side) press against the frame and secure the window by friction at any desired position: this arrangement shows no appearance of a fastener on either side of the window, and is a very cheap fixture.

Some French Savans have called a meeting of philologists, to be held in Paris next month, to devise means for adopting a universal language.