

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening Jan. 4, 1866, the President, Prof. S. D. Tillman in the chair.

LIVE FROZEN FISHES.

The President read a brief abstract, in the London *Chemical News*, of the results of a long series of investigations by M. Pouchet on the freezing of animals. Among these conclusions are the following:—That no animal completely frozen is ever restored to life; that the first effect of freezing is to contract the capillary blood vessels, and expel from them the blood corpuscles; that as the freezing extends it destroys the blood corpuscles within the sphere of its action; that the remains of these destroyed globules mingling with the healthy blood exert a poisonous influence upon it, and if this influence is of sufficient extent it proves fatal.

Dr. Feuchtwanger remarked that the statement must apply to warm blooded animals only, as it is well known that the life of a fish is not destroyed by freezing, provided the thawing is conducted very slowly. The speaker said, however, in reply to a question, that he had never observed this personally.

Dr. Rowell said that he had seen eels frozen solid in mud, and when they were slowly thawed in cold water they swam about as lively as ever.

Capt. Maynard said that he once took a salmon from Lake Quinsigamond, frozen solid in the ice, and put it into a spring by his grandfather's barn, and the next summer he saw it swimming about in the spring as full of life as any other fish.

Dr. Stevens remarked that the destruction of the blood corpuscles by freezing has long been known.

NUMEROUS BOILER EXPLOSIONS.

The evening was principally devoted to the discussion of boiler explosions, and the old notions were repeated at great length. The only new idea or fact advanced was a statement of boiler explosions which have occurred in the country since the 12th of October, read by Mr. Norman Wiard; the total number was 20, the deaths caused 92, and the wounded 92.

FORCE, POWER, AND WORK.

Mr. Wiard gave an account of the bursting of a great cannon at Pittsburg. It was cast on the Rodman plan, that is to say, it was cooled by a stream of water through the core; and it split longitudinally throughout its whole length just as it left the mold. The crack opened half an inch at the exterior surface of the gun, but the sides of the crack came together at the surface of the bore. Mr. Wiard said the cause of the cracking was manifestly the unequal shrinking of the metal; that about the core hardened first, and when the exterior hardened it was in a state of tension around the central portion. He had calculated the force requisite to overcome the tensile strength of the metal in producing this rupture, and it amounted to 92,000,000 pounds.

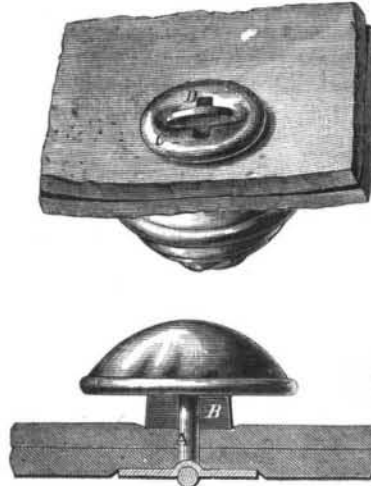
Mr. Blanchard said the force in this case amounted to nothing—it was not so much as he could produce by a few motions of his arm. There was no force unless it acted through some distance. There was a general misapprehension about this matter.

[If we understand Mr. Blanchard, he confounds force with "work" and with "power." Mr. Wiard uses the word in the signification attached to it by philosophers in employing it to express the energy requisite to overcome the tensile strength of the iron. The measure of force is independent of the distance through which it is exerted, or of the time in which it acts. If force acts through any distance it performs "work," and the quantity of work is proportioned to the amount of force and to the distance through which it is exerted. "Power" is constant energy, which is capable of performing work continuously, and it is measured by the quantity of work which it can perform in a given time.—E.D.S. SCI. AM.]

EFFECT OF FREE SCHOOLS.—Dr. Bellows, President of the Sanitary Commission, has published a note saying that the statistics show that eighty per cent of the soldiers of the Union armies were Americans; and that, as nearly as can be ascertained, of all those asking charity or assistance in any way since their discharge, ninety per cent are foreigners.

BARNUM'S BUTTON.

This invention represents a new method of attaching buttons to clothing without the use of needle or thread. The method of attachment is wholly mechanical, and the button is practically irremovable by accident; it can, however, be taken off in a moment when desired. The hold of the button is per-



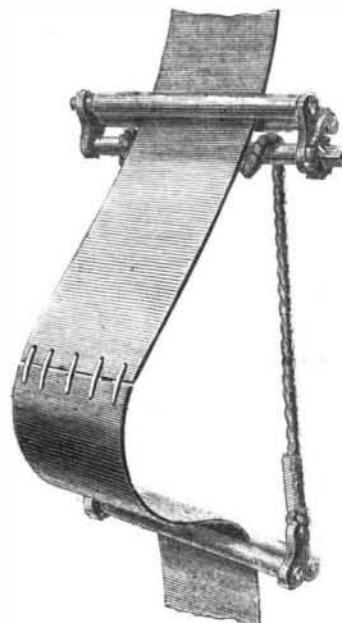
fectly secure, the cloth is strengthened by the fastening and the lap of the button-hole about the button is also better by reason of the projection or clearance between the button and the cloth. The invention is very clearly shown in the engraving. The button has a long shank, A, which is formed into a T at the end; between the button and the cloth is a piece of rubber, B, through which the shank passes. The washer, C, has a slot, D, and a slight depression in it; the T is pushed through this slot and turned so as to fall in the depression; the spring of the rubber then draws the button up firmly to the washer, and holds all parts beyond the chance of slipping. If preferred, a metallic spring can be used instead of the rubber.

This is a very neat and substantial fastening, and should become popular. The invention is for sale or to lease on favorable terms to any parties who will give it a fair trial.

It was patented through the Scientific American Patent Agency by C. T. Barnum, of Waterbury, Conn., on Sept. 12, 1865; for further information address him at that place.

ROGERS'S BELT STRETCHER.

Every mechanic and manufacturer knows that much time is often lost by the deflection of the large driving belts in workshops. They often give out in working hours, and require to be laced thoroughly in order to get along at all. At such times belt



stretchers are in great request, but through the inefficiency or bad construction of the ones commonly used, the operation is rendered very tedious, and the belt is often made to run "out" by stretching one side more than the other.

The machine here shown is the best one of its kind that we have ever seen. It performs its work remarkably well and can be handled by any shop laborer. It is not necessary to cut the belt before putting this stretcher on, but it may be applied, the belt drawn up, and then cut to the proper length without any guess-work. It will take any belt, thick or thin, and will draw up the same to the right degree of tension in a few minutes—the inventor says "two."

The invention consists of a set of eccentric rollers, applied as shown, and a ratchet wheel on the end of a winding shaft to take the strain and prevent the belt from slacking or slipping. The rolls being eccentric to their axes bite without bruising or injuring the belt, and the increased tension of it causes them to bite still harder. No letters of reference are applied, as the principle of the thing is seen at a glance.

A patent on this invention was allowed, through the Scientific American Patent Agency, on Dec. 16, 1865, to Seymour Rogers, of Pittsburgh, Pa. For further information concerning the patent which is offered for sale, address him at that place.

MISCELLANEOUS SUMMARY.

A PUMP PROPELLER.—The London *Mechanics' Magazine* says that a vessel is now building for the English Admiralty, by the Thames Iron Works and Shipbuilding Company which is remarkable as having been designed on a plan expected to supersede all other steam vessels, screw or paddle, by proving the practicability of propelling vessels by sucking in a column or "rope" of water, by a turbine wheel arrangement, through a ship's bottom and squirting it again out of the ship through her sides. It is feared that, whatever results may be obtained, they will be rendered unimportant by the excessive cost of their production.

Mr. Sartorius von Wattershausen, a distinguished geologist, who has devoted several years to studying the phenomena of Mount Aetna, has determined, by ascertaining the specific gravity of the boiling lava thrown from the crater of the volcano, that the depth from which the substance is raised is something more than seventy-seven miles, and that the force by which its expulsion is affected, is equivalent to the pressure of 36,000 atmospheres.

WHERE WAS THE FIRST RAIL ROLLED?—Mr. W. S. Langridge, of Aldermasley Iron Works, Ambergate, says, in the *Mining Journal*:—The first rail ever made was at the Bedlington Iron Works, Northumberland, and from these works a staff of men were sent to Penyardron to teach the Welshmen to make rails.

Geo. W. Day, of Chelsea, Mass., the inventor of a machine for making shoes which drives the shoe thread like pegs, a good imitation of pegged work, has sold his interest for \$200,000, and is to receive a per centage on every pair of boots made by this process.

AMERICAN LITHOGRAPHIC STONE.—Mr. S. D. Morgan, of Nashville, Tenn., states that there is an abundance of lithographic stone in Tennessee, in all respects equal, according to tests, to any from Bavaria or elsewhere.

The ancient Greeks used a mixture of salt, niter, and alum when melting their gold, by which substance the silver was also purified. It is not improbable that lead was also added, to promote the flux of the metals.

The French Exhibitions or National Expositions date from the year 1797, when the first was held in the palace of St. Cloud, with the object of reviving the industrial resources of France, which had suffered much during the revolution.

The Siberian plumbago differs considerably from that obtained in Cumberland, inasmuch as it is almost impossible to erase the marks of the former by india-rubber.

PHOTOGRAPHIC MOSAICS.—This is a most interesting little work for photographers, comprising accounts of all the leading discoveries and improvements in the art during the past year. The editors are M. Carey Lea and Edward L. Wilson, whose names upon the book are a sufficient guarantee of its practical excellence and value.