

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening, April 28th. From a great variety of miscellaneous business we select for mention only a sample of the work of—

BLANCHARD'S MACHINE FOR TURNING STATUES.

Dr. Rowell presented an unfinished marble bust in miniature, which had been copied from a full-sized bust of Daniel Webster by means of Blanchard's machine. This machine was invented by Thomas Blanchard, and is a simple modification of his lathe for turning irregular forms, described on page 258 of this volume. The cutting tool in this case is a sharp pointed steel drill, rotating with great velocity, and supported in a lever having its fulcrum at one end, while the opposite end, terminating in a pointed finger bent at right angles, rests upon the bust to be copied. The bust and the block to be sculptured are both secured to the same shaft, and are moved slowly along horizontally while they rotate—the bust beneath the supporting finger of the lever, and the block beneath the cutting drill.

The likeness to the great orator in this machine-made bust was perfect; the deep cavernous eyes and the calm thoughtful expression being reproduced with delicate fidelity.

Dr. Rowell remarked that he was reminded to bring the bust for exhibition to the society by observing an announcement of the inventor's death.

THE USE OF WATER WITH FUEL.

Mr. Stetson, being invited by the chair to open the discussion of the regular subject of the evening, gave a brief account of the chemistry of combustion, and remarked that if there was no absolute increase of heat from the decomposition of water and the burning of its elements—a problem akin to perpetual motion—there might a very large economy result from the mechanical action of water or steam on coal or other fuel.

Mr. Reed described a furnace which has been for some time in use at Newark, N. J. The air enters through hollow grate-bars, and issuing from holes in their lower sides passes up between them to the fire. This circulation of air prevents the bars from melting or burning. Wet tan bark, dripping with water, is shoveled into the furnace, and an intense heat is the result. Whenever the furnace doors are opened the interior of the furnace is filled with smoke, but as soon as the doors are closed the smoke disappears, and a passer-by would not know from looking at the chimney that there was any fire in the establishment.

Mr. Bassett :—At our gas works, near Providence, R. I., we are using superheated steam in the furnaces for heating our retorts, and the saving in fuel is 50 per cent. We have twice as much coke to sell when we use steam in the furnaces as we do when steam is not employed. The waste heat from the furnace passes through an upright boiler in the rear of the retorts, and the steam is brought forward through a pipe which is coiled around the fire-box, where the steam becomes superheated, when it is admitted in fine jets into the fire-box, 5 jets above the grate and 2 below on each side. The steam pipe around the fire-box becomes so highly heated that if a stick of wood is introduced among the coils it quickly takes fire. The heat in the furnace is so intense that we are obliged to use clay retorts for making the gas; iron retorts being destroyed in a short time.

The discussion was continued at considerable length by a number of speakers, but no other new facts were elicited. The same subject was continued, and the Association adjourned for two weeks.

The Cotton Culture in Italy.

We find in *Le Moniteur Illustré des Inventions* the following account of an exhibition at Turin of cotton cultivated in Italy:—

"The principal organizer of this exhibition was M. Devincenzi, a deputy, the same who represented the Italian Government, as commissary general, at the Universal Exhibition at London.

"The number of exhibitors was 207, belonging for the most part to the Tuscan marshes, Sardinia, Sicily, the Campagna of Rome, and the Neapolitan provinces.

"The number of samples of cotton was 685, 306 of which were of the species of Siamese white cot-

ton, 48 of Siamese yellow cotton (red fiber), 82 of herbaceous cotton, 7 of bristly cotton, 80 of New Orleans, Louisiana and North Carolina, 110 of Sea Island, 25 of Mako and 27 belonging to species not classified.

"This enumeration shows that the cultivation of cotton has begun to occupy the serious attention of the Italian people. We announce in another place the formation of a society which is going to introduce this culture on a large scale in the island of Sardinia. A general satisfaction was expressed with the quality of the cotton exhibited. What the Italian producers require is a greater familiarity with the industrial processes. Some laudable efforts are being made to acquire this familiarity, and with perseverance the aim will be soon attained."

MORLEY'S NOISELESS COG-WHEEL.

It is always desirable to have machinery run noiselessly, but with the cog-wheels in factories—or of geared engines in screw propellers and for similar uses, this feature is absolutely necessary to comfort and economy. The wheel illustrated herewith is designed to obviate this difficulty; its principle consists in insulating the periphery, or part containing the cogs, by means of a layer of a non-conductor of sound, placed between the periphery and central part of the wheel.

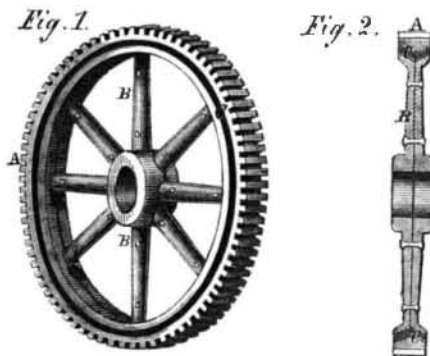


Fig. 1, is a perspective view of a finished wheel, and Fig. 2, is a cross section. A, is the periphery, B, the center, and C, the india-rubber or insulating material. The center is formed in two parts, as shown in Fig. 2, and riveted or bolted together so as to gripe the india-rubber between the beveled circumferences and the internal beveled face of periphery, A. In operation, the noise of the cogs which would be transmitted by passing along a solid, is interrupted and absorbed by the insulator. The inventor has a standing offer of \$300 for this invention, which will be accepted at the end of three months, if in the meantime a better one is not received. Its utility and value can be tested at a trifling cost by any mechanic. It is cheaper, stronger, and much more durable than a wooden-toothed wheel. This invention was patented on Feb. 10, 1863; for further information address the inventor, F. A. Morley, Station B, New York City.

Utilization of Brine.

Another has just been added to the many instances in which purely scientific research has led to the development of the arts and manufactures. Mr. Alex. Whitelaw, of Sidney Street, has invented and patented a process for the treatment of the hitherto waste brine of salted meat, so as to produce therefrom nutritive and wholesome extract of meat and portable soup. His process is the first practical application of Mr. Graham, the master of the Mint's recently-made, curious, and interesting discovery of "dialysis." Mr. Graham, after pursuing these elaborate investigations on liquid diffusion that have occupied him for many years, found that when animal membranes (as well as some other bodies of a similar nature) were interposed between solutions of various substances and water, that "crystalloid" bodies freely diffused themselves through the membranes into the water; but to "colloid" bodies, such as gum, albumen, &c., the merest film of such a membrane presented an almost impassable barrier. Mr. Whitelaw has availed himself of this principle in his process, which is of the simplest character. He can conduct the dialytic operation in vessels of various forms and materials, but the arrangement he prefers to employ as being in every respect ractically the best is a series of bladders, fitted with

gutta-percha necks and plugs. These bladders are filled with the previously filtered brine, and hung in rows from poles stretching across and suspended into vats of water. The water is renewed in these vats once or twice a day, and the action allowed to go on; when, at the end of the third or fourth day, it will be found that nearly all the salt and niter of the brine have been removed, and that the liquid contained in the bladders is pure juice of flesh in a fresh and wholesome condition. This juice, as obtained from the "dialysers," may now be employed in making rich soups without any further preparation; or it may be evaporated to a less or more concentrated state, and packed in hermetically sealed tins for sale. The extract of meat thus obtained is in the highest degree nutritive and wholesome, and well adapted for hospitals, for ships' use, and for an army in the field. Mr. Whitelaw has also adapted his process for the use of ships at sea, for the economization of their brine, and for the improvement of the food, and, consequently, the health of the men. The quantity of brine annually wasted is very great. In Glasgow alone not less than 60,000 to 100,000 gallons are thrown away yearly; and if we take each gallon as equal in soup-producing power to 7 lbs. of beef, some idea may be formed of the economic value of this process.—*Glasgow Herald*.

Tremendous Results from the Explosion of a Small Boiler.

Under the head of "Life in Greenock," an English journal describes a boiler explosion which took place in that town. One would think Greenock an undesirable town to settle in, if this be a sample of the life in it. The journal in question says:—

"The *Ruby*, a strong iron screw lighter, with a high pressure engine of 8-horse power, lately arrived at Greenock from Glasgow, deeply laden with coal. She had been in collision on the way down the river, and sprung a leak in the fore compartment or cabin. The *Ruby's* bow was therefore run upon the bank when her stern went down, and immediately thereafter her boiler burst with a tremendous report, which shook the houses for a great distance round to their foundation. Scarcely a house within a circuit of 200 yards but had its windows broken by the concussion. People along the quay-breast suffered severely by pieces of the boiler, coal, and wood entering their houses. What is most remarkable, considering the damage done to the surrounding property, is that only one man was killed, and that not one of the men on board the *Ruby* suffered any injury. A young lad had his leg broken; Mr. M'Kenzie, a pilot, had his leg bruised; Mr. Livingston had his head cut; and others got slight wounds. The scene along the coast was one of great devastation. The street was perfectly wet, and pieces of wreck spread all over the quay. The Lord Clyde Hotel had almost every pane of glass broken. The force of the concussion was so great that in one room the windows and frames were blown in; an infant was carried out of its cradle and lifted fully a yard away, while the cradle was upset; and a servant girl passing along the lobby was carried out to the stair-head. Warner's lodging house suffered most; several stones in the wall were knocked in, and the steam-pipe carried away the boiler and entwined itself in the blind. Pieces of the boiler were carried over the houses and fell in the adjoining streets; one piece, of three iron plates, was carried about 400 yards, over a three-story building."

French Patent for Refining Petroleum.

L. Martin's French patent for refining petroleum, and for a mixture of it with rape-seed oil to burn in common lamps, is thus described:—

"Supposing a tun of petroleum is to be operated upon, about eight per cent. weight of caustic soda dissolved in water is added to the petroleum in a large vat, after which about ten per cent. of tepid water is added, stirred, and the whole allowed to rest for four hours. A precipitate falls to the bottom of the vessel, and the clear is then drawn off with a siphon, and placed in a still. It is now distilled at a temperature of 248° Fah., steam heat being used for the purpose. A light eupion oil passes over at this heat, and 35 per cent. of rape-seed oil is added to it and makes a good burning oil for common lamps. The remainder of the petroleum in the retort is now subjected to heat of from 437° to 600° Fah., when heavier oils are distilled. They are mixed with ten