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Test Papers.

On the otherwise barren rocks which fringe the shore of the Cape de Verd Islands grows the archil—a famous seaweed of lichen, renowned among dyers. By a particular process of manufacture this archil yields a beautiful blue pigment, known in the chemical laboratory by the name of *litmus*. Few colors are more fugitive than litmus. Being a fine violet-blue, it is changed to red by so minute a portion of any acid that it becomes, when properly applied, *a test* of the presence of the latter substance. As it is so frequently desirable to know whether a fluid be acid or alkaline, one of the first practical lessons to a student in chemistry is to prepare litmus test paper thus: Put into a tumbler half an ounce of litmus and three ounces of water; let them remain together in a warm place for a few hours, then filter the dark blue liquid from its impurities, divide the solution obtained into two parts, pour one portion into a saucer, and soak strips of white writing paper in it until it has acquired a distinct blue color. If not colored enough by once dipping and drying, repeat the operation. When dry, preserve these strips in a box labelled "Blue litmus test papers." These serve to *test* any fluid, to ascertain if it has an *acid* reaction. It is instructive to learn how very small a portion of any acid in water will be indicated by the reddening of the litmus. With the second portion of the fluid mix cautiously a few drops of lemon juice until it is red; then color paper as before. When dry, this "red litmus test paper" serves to indicate the presence of alkalies, a class of bodies opposed to acids. Red litmus test paper on being put into any fluid that is *alkaline*, such as lime water, is immediately restored to its original blue color. Put the ashes of a cigar into water; the liquid when "tested" will indicate the presence of an alkali. To test stale milk; if blue paper becomes red the milk is sour—it is acid.

A Perverted Nautical Taste.

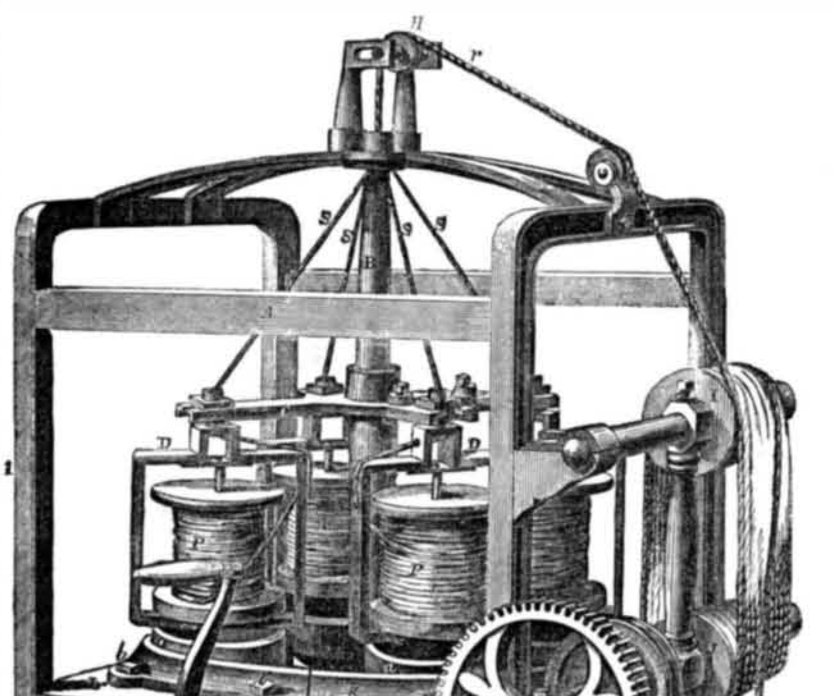
The editor of the London *Mechanics' Magazine* says "the frigate *Niagara* is without exception the ugliest man-of-war we have ever seen. On visiting her at Gravesend, we approached her on the bow, and looked in vain for a single beauty of form about her."

What a nautical taste! If the *Niagara* had a bow as bluff as a tub, and overhanging like the mountains in a Chinese picture, it would no doubt have excited the admiration of our cotemporary.

Erratum.

Mr. Willis Humiston's candle machine, illustrated in our last number, was patented July 24, 1855. The patent of 1854—the date of which was given by mistake—was for another and less valuable improvement, in which the candles are drawn from the molds by pulling on the wicks. We may add that both inventions are applicable to the manufacture of sperm and stearine, or adamantine candles, as well as tallow.

WALLWORK'S ROPE MACHINE.



The accompanying figure is a perspective view of the improved rope-making machine, for which a patent was issued to Milton Wallwork on the 7th of April last. The improvement relates to the "sun and planet" rope machine, and consists in the means of controlling the speed of the strand flyers, for enabling the twist of the strands to be varied with facility. The figure represents the application of the machine to laying rope in a very small space, obviating the use of long rope walks.

A represents the frame of the machine, and B is the upright or main laying spindle, which rotates in suitable bearings in the frame, and carries a spider, C, at the top, and one at the foot above the table or platform, These contain the bearings of the journals of the strand flyers, D D, in which are the strand spools, P P P, but cans may be employed instead of the spools. E is a horizontal driving shaft, on which, under the table, is a bevel wheel, gearing into a bevel pinion on the foot of the laying spindle, B. Above this spindle is a guide pulley, H, to conduct the rope *r*—formed by twisting the strands, S S, S S, in the laying top—to the reel rollers, I J, from which it is carried and wound up regularly, as fast as it is made, on the capstan, R.

By the rotation of the laying spindle, B, it will be observed how the strands, S S, are laid or twisted into rope in the laying top, and afterwards wound or *built* on the capstan. But in laying rope, the twist given to the united strands being contrary to that of the strand twist, it is necessary to give the strands a counter twist at the time the laying twist is given to the united strands. It is desirable and necessary that means should be provided to give the strands a variable twist according to the kind of rope to be manufactured. In this machine the devices for accomplishing this object are exceedingly simple.

Each of the flyers, D D, is furnished—just above its lower journal—with a roller, *a*. Immediately below the level of these rollers on the table, L, (which has a circular opening in it, large enough to allow the whole frame of flyers to revolve,) there are bolted a series of segments, K, which form portions of a stationary ring encircling the rollers, *a*, and in contact with them. These segments are adjustable by means of the screw bolts, *b b*, passing through slots. As the spindle B rotates, carrying the strand flyers round, the contact of the rollers, *a a*, with the interior face of the segments, K, causes these rollers to rotate the strand spindles, thus giving them rotation in a contrary direction to that of the *lay* of the rope, and the necessary motion to produce the counter strand twist. One or more of these segments may be easily moved out of contact with the rollers, *a a*, or taken off altogether. When all the segments, K, forming a continuous ring, touch the rollers, *a*, the flyers receive a motion on their axes during their whole revolution round the spindle, and thus give the maximum twist to the strands. By the removal of one or more of the segments K from the circle, the rotation of the strand flyers on their axes is graduated; the greater the number of segments removed, the less will be the twist of the strands. To prevent the untwisting of the strands when the rollers *a* are passing those parts of the circle where they do not touch the segments, there are ratchets and pawls (not seen) which allow the rollers, *a a*, to turn only in one direction. In this manner the strand spindles are rotated, and their motion regulated as desired by the simple stationary sectional ring K.

The take-up motion is produced by gearing from a pinion on the main shaft of pully T, giving motion to wheel U, thence to wheel V, pinion V′, and wheel W, on the shaft of roller J; a band passing from a pully on this roller shaft rotates the capstan R; the rope is laid regularly on the capstan by a traversing guide on the rotating double screw shaft Z, and the take-up of the capstan, as the coil increases in size, is regulated by graduating its rotation through compensating gearing. This rope machine is compact in form, and very simple in its construction and arrangement of parts. The efforts made to construct short rope machines of as great simplicity as the machinery now employed in long rope walks will doubtless result in practical success.

For more information address Mr. Wallwork, or Mr. Stephen Williams, at Hoosick Falls, N. Y.

Interesting Gunpowder Experiment.

The following is from the *Druggists' Circular*, a very useful and able new weekly, published in this city:—

In his seventh lecture, at the Smithsonian Institute, Dr. Reid described the failure of an intending incendiary to do a great act of mischief by the very means he adopted to make his success more certain. Thus to ensure an explosion of gunpowder in a certain case, the fellow had covered it with a quantity of spirits of turpentine, but on igniting it only the turpentine burnt, and the powder continued as before. The philosophy of this the lecturer showed, by a striking experiment wherein, again and again, turpentine poured on a quantity of gunpowder was ignited and burned out, and the powder remained unburnt. This was explained on the principle of the candle, that the gunpowner acts as a wick to the turpentine, and will not itself ignite so long as any of the turpentine remains to burn. A piece of common cotton cloth, such as ladies' dresses are made of, was then burnt; and then a piece of similar texture which had been dipped in a solution of sal ammoniac, was exposed to the action of fire, but would not burn. A similar piece, steeped in a solution of silicate of potash, was also shown to be quite incombustible.

Silver in New Jersey.

Paterson and vicinity apparently is destined to be one of the most noted spots in the country. Already it has become celebrated for the discovery of pearls, and now, the *Guardian* states that veins of copper and silver have been struck in Garret mountain. A shaft about fifty-five feet deep has been sunk, and a bed of copper ore, sixteen feet thick, has been found. Some distance below the copper a vein of silver ore has been struck. The thickness of this at the place where the shaft was sunk is stated to be between two and three feet. No intimation is given of the nature of the ores of either metal, and if not entirely a myth, analysis will probably show both these "ores" to be much too poor for working.

Collodion Photography.

English papers record the decease of Frederick S. Archer, the inventor of the "collodion process" in photography. After numerous experiments, he discovered the mode of rendering collodion sensitive and obedient to the photographic process, by means of which the most interesting objects in nature as well as art are now portrayed, not only with unerring correctness, but are also transfixed almost as quick as the lightnings' flash. The collodion process has enabled skillful artists to take copies of shore scenes while passing along on board of a steamboat.