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The Steam Battery "Monitor."

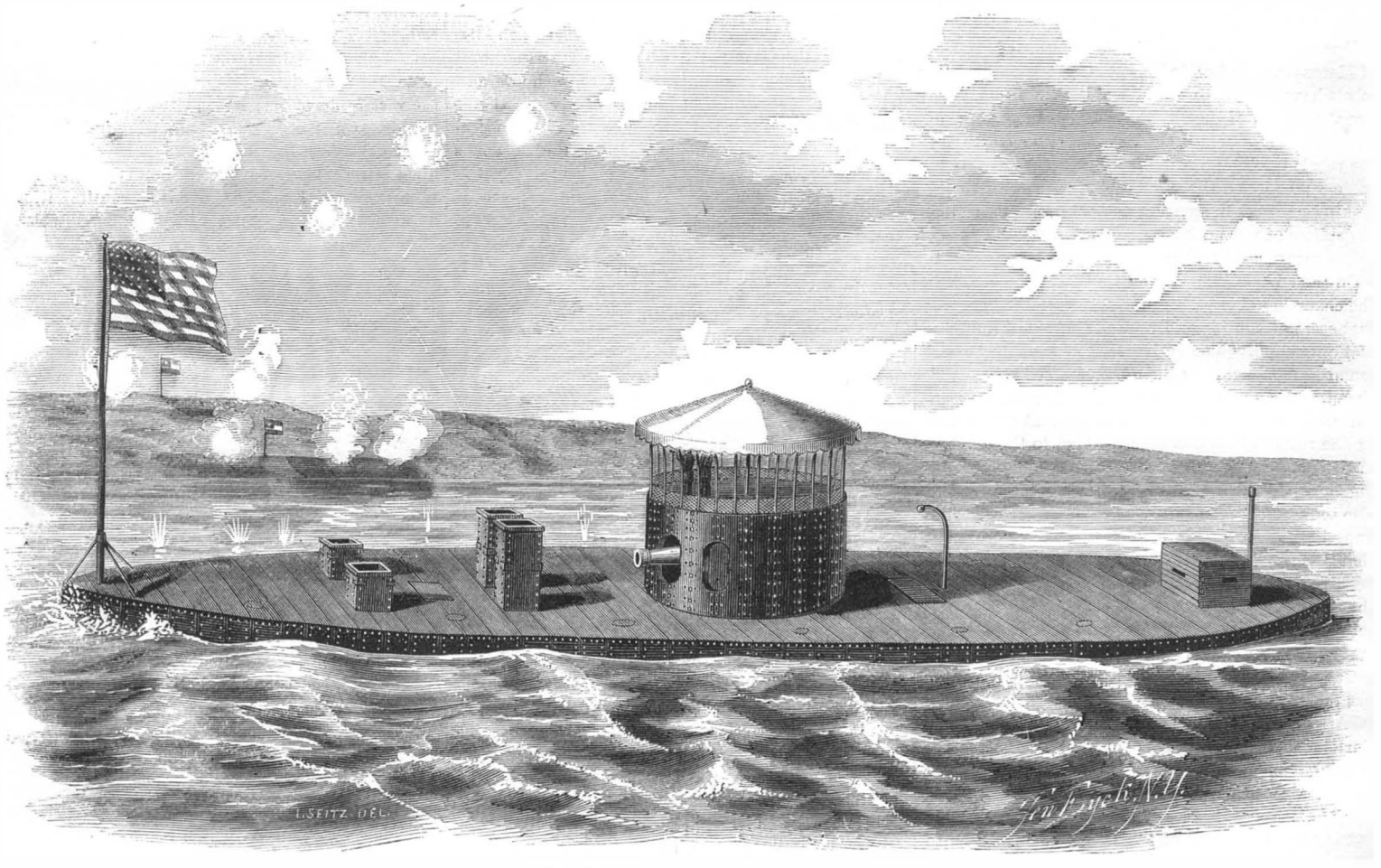
We present herewith a perspective view of the Ericsson steam battery, engraved from a drawing which was made by our artist while the vessel was lying at the Brooklyn Navy Yard, just before she sailed on the trial trip which has proved so full of important and exciting events.

On page 331 of our last volume we gave a full description of this battery, but will repeat the principal dimensions. The upper section of the veseel is in the form of a flat-bottomed scow, with sharp ends and vertical sides, 5 feet deep, 174 feet long and 41 feet 4 inches wide. The central portion of the bottom is cut out for a length of 124 feet and a width of 34 feet, to communicate with the lower section, which is attached to the bottom of the scow, and which extends down with inclined sides to a depth of 7 feet 6 inches The lower section is built of iron, the plates being ½ inch in thickness. The upper section is built very strongly of wood and iron, the vertical sides being of solid oak 30 inches in thickness, covered by one-inch rolled iron plates to the thickness of 6 inches. The propeller and rudder, being under the projecting end of the upper section of the vessel, are securely protected from shot.

The principal novelty of this vessel is the cylindrical revolving turret in which the guns are placed. This is formed of rolled one-inch iron plates bolted together to the thickness of 8 inches; its internal diameter is 20 feet and it is 9 feet high. It rests at its lower edge on a smooth, flat ring of composition metal, but when in action the principal portion of its weight is sustained by a central shaft, about which it revolves; a massive wedge being driven below the step of the shaft on such occasion to raise it, and thus cause it to bear up the turret. A large spur wheel upon the shaft is connected by a train of gearing with a small steam engine, which supplies the power for turning the turret.

Two 11-inch guns are placed within the turret in position precisely parallel with each other, on smooth ways, or slides; a clamp being arranged upon the sides of the ways for adjusting the friction and taking up the recoil in such distance as may be desired.

The turret is pierced in different places with four holes for the insertion telescopes, and just outside of the holes reflectors are fixed to bend the ray of light which comes in a direction parallel with the guns through the axis of the telescope, which is crossed by a vertical thread of spider's web through the line of collimation. The sailingmaster takes his position in the turret, with his eye to the telescope and his hand upon the wheel that governs the motion of the small engine, and turns the turret so as to keep the guns always directed with absolute precision to the object against which the fire is directed. A scale is also arranged for adjusting the elevation of the guns with similar engineering precision, and it would seem that the firing should be directed with unprecedented accuracy.



THE ERICSSON STEAM BATTERY "MONITOR."

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cessary for us to say that we comply with the suggestion with the most hearty acquiescence. While so many thousands of our countrymen are enduring the labors and sufferings of the campaign, and hundreds are pouring out their hearts' blood for the salvation of the nation, we who stay at home should certainly do nothing to embarrass the military operations. Should the occasion for privacy, however, be soon removed we shall probably publish these views with a perspective of the interior of the turret.

Our engraving represents the battery as ready for sea. In preparing for action, the awning over the turret is removed and the square smoke stacks as well as the shorter pipes, through which air is drawn into the vessel, are taken down. The small square tower at the end is the wheelhouse in which the steersman stands. It is made of bars or beams of iron 9 by 12 inches interlocked at the corners.

When iron turrets were first proposed, it was apprehended that the concussion in the interior would prove intolerable to the men who were working the guns, and experiments were made in England to test the matter. It was found that when the turret was entirely closed, the men could not indeed bear the concussion, but on making a sufficient opening in the top, the difficulty was completely obviated. The result of this investigation was known to our Navy Department before the contract was made for the Ericsson battery. After the battery was completed her 108-pounder guns were fired a few times to test the effect of the concussion on the turret and on the men within it, and no inconvenience was experienced. Capt. Ericsson informs us that he requested one of the officers to observe the effect carefully, and the gentleman says that with his hand upon the side of the turret when the gun was discharged, he could not feel the slightest jar, and that the man in the shell room directly below the turret, with the iron hatch tightly closed, actually did not know when the gun was fired!

NOTES ON MILITARY AND NAVAL AFFAIRS.

THE ROLLING BACK OF THE REBELLION.

Along the whole line, from the northwest corner of Arkansas to the eastern edge of Virginia, the discouraged and demoralized troops of the rebels are falling back before the steady and irresistible progress of the government forces. The good news which we recorded last week of the evacuation of Columbus, the stronghold of the West, is followed this week by the still more important intelligence of the evacuation of Manassas, (the fortified camp in the East, where the rebels have so long insulted and threatened the national capital), of a great victory in Arkansas and of a naval battle in which the most formidable vessel of the rebels has been discomfited by a little government battery; while on the coast the national forces are making progress in securing new points and extending the sphere of our authority.

CAPTURE OF FERNANDINA AND ST. MARY'S.

On the 2d of March Commodore Dupont sailed into the channel which separates Amelia Island from the east coast of Florida and took possession of the town of Fernandina, which is situated on the island. He found Fort Clinch, on the north end of the island, abandoned, and raised the national flag on its ramparts. This is the first of the forts that were seized by the rebels which has been restored to the government; may we soon have the satisfaction of recording the restoration of the last. Commodore Dupont also took possession of the town of St. Mary's without opposition. He says in his dispatch that the report that the fortifications of St. Simons, armed with heavy columbiads, are abandoned, is confirmed, and that the entire sea coast of Georgia is now either actually in his possession or under his control.

THE GREAT VICTORY IN ARKANSAS.

One of the most important battles of the campaign has taken place at Pea Ridge, in the northwest corner of Arkansas, between the Union army under General Curtis and some 25,000 rebels under Van Dorn. The fighting continued three days, and resulted in the complete route of the rebels. The notorious rebel, Ben McCulloch, was killed, and at last accounts our cavalry was in pursuit of the flying enemy in hopes of capturing the commander, Van Dorn.

It appears by the official report of General Curtis that our army was attacked on Thursday, the sixth of March, by the forces of the rebels, which were concentrated against our right wing, under Gen. Sigel. The attack was steadily sustained and finally repulsed. During the night General Curtis changed the position of his forces, and the next morning the fight was renewed, and it continued throughout the day. On the third day it was resumed, when General Curtis ordered a charge along the whole line, which effected the complete route of the rebels, "who retired in confusion, but rather safely, through the deep, impassable defiles of the cross timber."

THE EVACUATION OF MANASSAS.

The most important event of the campaign is the evacuation of Manassas. At 9 o'clock in the morning of Tuesday, March 11th, the New-Jersey volunteers entered the famous stronghold and hoisted the stars and stripes over the deserted works. It is thought that the evacuation has been in progress for two or three weeks. The guns were all removed, but there are reports that stores in considerable quantity were left behind. The barracks of the rebels were built of logs, and were of sufficient extent to acccommodate 100,000 men. The evacuation was accompanied by the withdrawal of the batteries which have so long blockaded the Potomac below Washington. Nothing is publicly known of the destination of the great army that has so silently withdrawn from Manassas, though fears are expressed that it may be the intention of the commanders to fall back upon Burnside's army, or some others of our detachments, and annihilate them. It is to be hoped, however, that General McClellan will follow up the retreating forces with sufficient vigor to prevent them from doing any considerable mischief in any quarter.

Though the country is very properly jubilant over the great and general retreat of the rebel forces, it is not to be forgotten that these forces are still formidable, and if concentrated by an able and energetic commander they might still deal some serious blows upon our vastly-extended line. We believe, however, that any such enterprises would be but the expiring throes of the monster whose doom is slowly but surely approaching.

Electric Telegraphs in Russia.

M. A. Komaroff—a Russian, apparently—has contributed an article on electric telegraphs in Russia to the last number of the *Revue Scientifique des Deux Mondes*, in which there are some curious statements He says that the introduction of electric telegraphs was as much opposed in Russia as railways in the Roman States. "Governments like the Russian always look with suspicion on improvements; in this respect they sympathize with the feelings of savages at the sight of scientific experiments." "Russia," he continues, "is the country in which the ideas of the illustrious philosopher, Ampere, were first applied; and yet it was the last country in which any attempt was made to bring them into practical use." The Emperor Nicholas looked upon the electric telegraph as a revolutionary engine. After his death, a network of electric lines was laid down, which now extends over 10,000, and will shortly exceed 12,000 English miles. In 1860, these lines transmitted 465,000 telegrams. In 1832, Baron Schilling de Kanstadt, a councilor of state in the service of Russia, constructed an apparatus with two wires of transmission and one magnetic needle; and, for the use of this machine, invented a combination of letters and figures, and even arranged for the ringing of a bell to call attention when the machine began to work; but his premature death prevented his bringing the apparatus into practical use. The first important line in Russia, from St. Petersburgh to Moscow, was opened for the exclusive use of the railway authorities and the Government, in 1852. At present, the network extends from Torneo to Odessa, from Warsaw to Omsk or Tomsk in Siberia, and is being every year pushed forward, so that we may eventually expect it to reach the confines of China, and be united to the lines which must very soon branch from Pekin. The difficulties of keeping the Russian lines in working order are very great. Snow storms, icicles of enormous dimensions, thunder storms and heavy fogs, constantly interrupt communication, and break down the poles erected across hundreds of miles of barren, howling deserts.

SILK CULTURE IN AMERICA.—As early as 1623 the cultivation of silk commenced in the colony of Virginia. In 1759, the colony of Georgia exported 10,000 lbs. of raw silk, which sold for two to three shillings higher per pound than that of any other country. In 1771, the cultivation began in Pennsylvania and in New Jersey under the auspices of Dr. Franklin and other enterprising gentlemen. In Connecticut, the cultivation commenced about the year 1790, and the value of the raw material and sewing silk made in three counties in that state in 1810, amounted to 28,503 dollars. In Texas much has been done within the past few years to establish its success among the German settlements in the western section. The greatest difficulty connected with the silk culture is the care required in attending the cocoons,

THE past winter has been of unusual severity in Russia. A great number of persons have been frozen to death.

Materials in their Invisible State.

If a piece of silver be put into nitric acid, a clear and colorless liquid, it is rapidly dissolved and vanishes from the sight. The solution of silver may be mixed with water, and to appearance no effect whatever is produced. Thus, in a pail of water we may dissolve and render invisible more than ten pounds worth of silver, lead and iron; but every other metal can be treated in the same way, with similar results. When charcoal is burned, when candles are burned, when paper is burned, these substances all disappear and become invisible. In fact, every material which is visible can, by certain treatment, be rendered invisible. Matter which, in one condition, is perfectly opaque and will not admit the least ray of light to pass through it, will in an other form become quite transparent. The cause of this wonderful effect of the condition of the matter is utterly inexplainable. Philosophers do not even broach theories upon the subject, much less do they endeavor to explain it. The substances dissolved in water or burned in the air are not however destroyed or lost.

By certain well known means they can be recovered and again be made visible; some exactly in the same state as they were before their invisibility; others, though not in the same state, can be shown in their elementary condition; and thus it can be proved that having once existed, it never ceases to exist, although it can change its condition like the caterpillar, which becomes a chrysalis, and then a gorgeous butterfly. If a pailful of the solution of silver be cast into the stream, it is apparently lost by its dispersion in the water; it nevertheless continues to exist. So when a bushel of charcoal is burned in a stove it disappears, in consequence of the gas produced being mixed with the vast atmosphere; but yet the charcoal is still in the air. On the brightest and sunniest day, when every object can be distinctly seen above the horizon, hundreds of tuns of charcoal, in an invisible condition, pervade the air. Glass is a beautiful illustration of the transparency of a compound which in truth, is nothing but a mixture of the rust of three metals.

The power of matter to change its conditions from solid capacity to limpid transparency causes some rather puzzling phenomena. Substance increases in weight without any apparent cause; for instance, a plant goes on increasing in weight a hundred fold for every atom that is missing from the earth in which it is growing. Now the simple explanation of this is that leaves of plants have the power of withdrawing the invisible charcoal from the atmosphere, and restoring it to its visible state in some shape or other. The lungs of animals and a smokeless furnace change matter from its visible to its invisible state. The gills of fishes and the leaves of plants reverse this operation, rendering invisible or gaseous matter visible. Thus, the balance in nature is maintained, although the continual change has been going on long prior to the creation of the "extinct animals."—*Septimus Piesse.*

Doctors Taking their own Medicine.

Dr. Oliver Wendell Holmes tells us how the members of the medical profession feel when the "poisoned chalice" of their prescriptions is commended to their own lips; in other words, when the visitor becomes the visitee:—

Just change the time, the person and the place,
And be yourself the "interesting case;"
You'll gain some knowledge which 'tis well to learn,
In future practice, it may serve your turn.
Leeches, for instance—pleasing creatures quite,
Try them, and, bless you! don't you think they bite?
You raise a blister for the smallest cause,
And be yourself the great sublime it draws;
And trust my statement, you will not deny,
The worst of draughtsmen is your Spanish fly.
It's mighty easy ordering when you please,
"Infusi Sennæ, caplat concias tres;"
It's mighty different when you quackle down,
Your own three ounces of the liquid brown;
"Pilulæ Pulvis," pleasant words enough,
When "other" jaws receive the shocking stuff;
But oh! what flattery can disguise the groan,
That meets the gulp which sends it through your own.

IN a chemical works in England, where sulphate of copper was manufactured, $3,500 worth of gold was lately taken out by a chemist from a lot of copper sediment which had been thrown aside as worthless. Most of the South American copper ore contains some gold.

THE *Great Eastern* has undergone repairs and is expected to sail for New York on the 1st of April.