

Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES

VOL. VI.—NO. 22.

NEW YORK, MAY 31, 1862.

NEW SERIES.

Railroad Suspension Chair.

The enormous sums expended annually by our railroad companies in repairing the ends of the rails which are battered by the numerous wheels so frequently passing over them, are stimulating inventors to devise some effectual mode of obviating the evil. One of the most novel plans which has been suggested for this purpose is illustrated by the annexed engravings. It consists in a chair for supporting the ends of the rails so formed as to yield slightly to the concussion of the wheels and thus diminish the shock.

Fig. 1 of the engravings is a perspective view of a railway track showing the manner of attaching the chair. Fig. 2 is a side elevation of the chair connecting the ends of two rails. Figs. 3, 4 and 5 are cross vertical sections of the chair and rail.

The chair, C, (18 inches long more or less,) is made of boiler or sheet iron, in one piece. It is intended to be formed by machinery so that it shall fit exactly to the sides and bottom of the rail, as seen in Fig. 3. Underneath the rail the plate is bent downward in a U-shape to the depth of $2\frac{1}{2}$ or 3 inches, more or less, which thus forms a strengthening rib sufficient to sustain every weight that may come upon it, but it is not heavy enough to form a solid bed on which the ends of the rails can be hammered or battered by the passing wheels. This U-shaped rib also serves another important purpose. In putting the chair upon the rails it allows the sides of the chair a chance to yield or spread apart, and thus accommodate itself to those variations in the thickness of the rails which are unavoidable. This elasticity is a very necessary consideration in the easy application of the chair to the rails, as it saves all fitting by cutting or filing. After the chair is in place the bolts, D D D D, are screwed up, and thus bring the sides of the chair into close-fitting contact with the sides of the rail. The bolts, D D D D, pass through slots in the web of the rail; these slots are long enough to allow for all expansion of the rail by heat.

On a hard rigid road-bed the nuts of the bolts, D D D D, are liable to loosen from the jarring produced by the rolling stock, and to guard against such a contingency, a wooden cushion or washer, E, Figs. 4 and 5, is introduced in order to impart such an elasticity as will almost entirely overcome this tendency. This is very important, as a great deal of labor is saved thereby.

The patent for this invention was granted February 5, 1862, and further information in relation to it may be obtained by addressing the inventor, Ira Leonard, at Lowell, Mass.

Disappearance of a Nebula.

The eminent astronomer, J. R. Hind, of London, has published the following letter:—

Toward the close of the past year it was announced by Prof. d'Arrest, of Copenhagen, that a nebula in the constellation *Taurus*, which was discovered at this observatory on the 11th of October, 1852, had totally vanished from its place in the heavens. That one of these objects, which the giant telescopes of the pres-

ent of an arc, with a condensation of light in the center; or its appearance was that of a distant globular cluster, when viewed in telescopes of insufficient power to resolve it into stars. From 1852 to 1856 a star of the tenth magnitude almost touched the edge of the nebula at its north-following edge; it was at first remarked on the night the nebula was detected, having escaped notice on many occasions when its position had been under examination with the same telescope

and powers. Hence I was induced to hint at its probable variability in a note upon the nebula, published in No. 839 of the *Astronomische Nachrichten*. The suspicion is fully confirmed; the star has diminished to the twelfth magnitude, either simultaneously with, or soon after, the apparent extinction of the nebula.

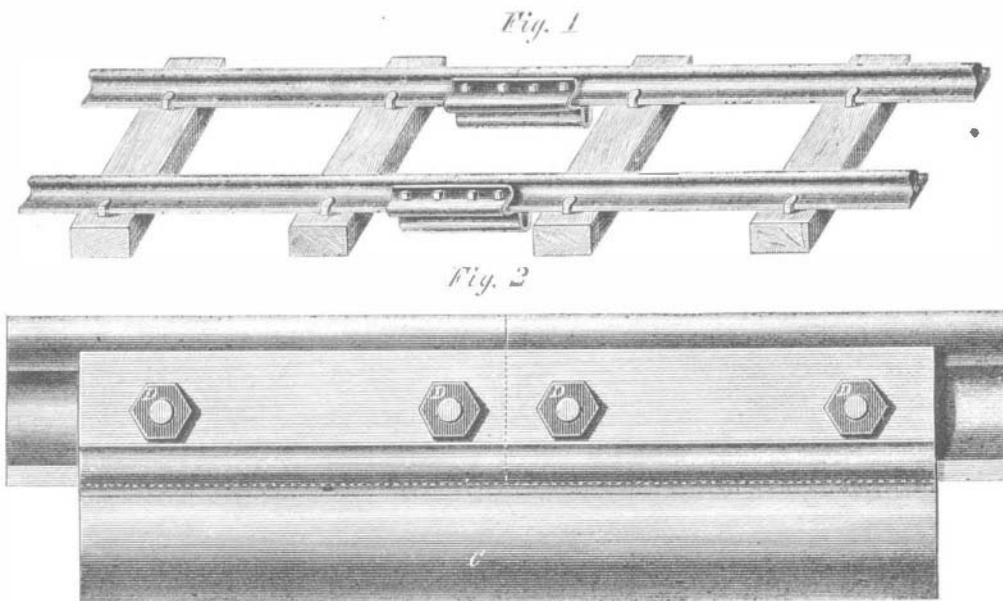
The history of this object, and the result of his observations on the night of January 26th, are appended by Mr. LeVerrier to his meteorological bulletin of the 29th. The sky being very clear at intervals, the Paris equatorial, which has an object glass twelve French inches in diameter, was directed to the place of the nebula, but notwithstanding

ing stars of an extremely faint class were visible in its immediate neighborhood, not the slightest trace of it could be perceived either by M. LeVerrier or M. Chacornac. The star which Professor d'Arrest and I have repeatedly noted, of the tenth magnitude, and almost touching the nebula, had dwindled down to the twelfth; so that telescopes which would

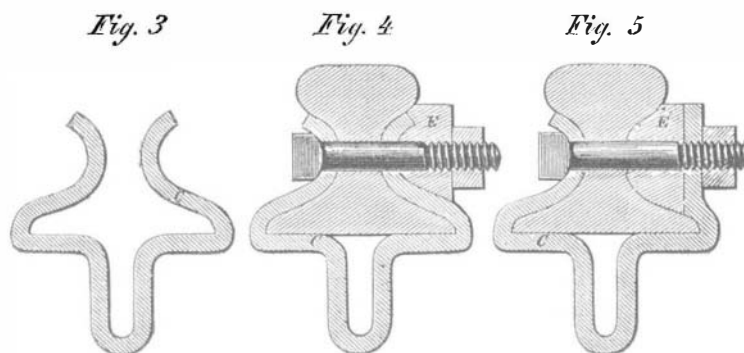
have shown it well between 1852 and 1856, would not at present afford a glimpse of it. From the fact that M. Chacornac saw the nebula in forming a chart of the stars in that region in 1854, and did not remark it while reconstructing the same in 1858 with a much more powerful instrument, there is reason to infer that the disappearance took place in 1856 or the following year.

How the variability of the nebula and a star closely adjacent is to be explained, it is not easy to say in the actual state of our knowledge of the constitution of the sidereal universe.

A dense but invisible body of immense extent, interposing between the earth and them might produce effects which would accord with those observed; yet it appears more natural to conclude that there is some intimate connection between the star and the nebula, upon which alternations of visibility and invisibility of the latter may depend. If it be allowable to suppose that a nebula can shine by light reflected from a star, then the waning of the latter might account for apparent extinction of the former; but in this case it is hardly possible to conceive that the nebula can have a stellar



LEONARD'S RAILROAD SUSPENSION CHAIR.



ent day had taught us to regard as assemblages of stars in myriads at immense distances from the earth, should suddenly fade away, so as to be quite imperceptible in powerful instruments, must, I think, have been deemed a very improbable occurrence, even by many who are well acquainted with the care and experience of the observer by whom the statement was

made. Within the last few days, however, Mr. LeVerrier has obtained so strong a confirmation of its accuracy that there is no longer room for supposing it to have originated in one of those errors of observation which every practical astronomer knows will creep into his work in spite of all his precautions. The nebula in question was situated in right ascension 4 hours 13 minutes 54.6 seconds, and north declination $19^{\circ} 11' 37''$, for the beginning of 1862. It was, therefore, about a degree and a half from the star *Epsilon* in *Taurus*, in the group commonly known as "the Hyades." Its diameter was about one minute

constitution. It is at least curious that several variable stars have been detected in the region of the great nebula, in *Orion*; that in 1860 a star suddenly shone out in the middle of the well-known nebula *Messier 80* (about half-way between *Antares* and *Betelgeuse*) which vanished in a few days, and that, as first remarked by Sir John Herschel, all the temporary stars, without exception, having been situated in or near to the borders of the *Milky Way*--the star cluster or ring to which our system of sun and planets belongs. In the latter class are included the memorable star of B. C. 134, which led Hipparchus to form his catalogue of stars, and those which blazed forth in 1572 and 1604, in the times of Tycho Brahe and Kepler.

In concluding, I will venture to express the hope that some of the many amateur astronomers in this country who have provided themselves with telescopes of first-rate excellence, will keep a strict watch upon the remarkable pair of variables which I have briefly described in this communication. Continuity of observation is often most important, and can only be secured and that not always in the uncertainty of weather by a strong force of observers in different localities.

NOTES ON MILITARY AND NAVAL AFFAIRS.

THE BATTLE.

The great armies are now face to face and the clash of arms may any moment break upon the ear. We heartily wish that the nation might be spared the further effusion of blood that our erring fellow citizens would lay down their arms and return to their allegiance, and experience at once how readily our government and the loyal people would offer protection even to those who have been deceived by bad leaders to take up arms against constitutional authority. But such a result cannot be expected, and more battles must be fought and more blood be shed; therefore the sooner these great armies are pitted against each other in deadly strife the sooner may we look for a solution of the great national trouble. As we think of our country thus afflicted, which but a few months ago was the most prosperous on the globe, we are led to wonder more and more why a portion of our people could have become so thoroughly madened as they now are.

At last accounts Gen. McClellan was within a few miles of Richmond, pushing forward to the attack with a commendable zeal and prudence, and it seems to be understood that the enemy will dispute the right of occupation with great desperation.

Gen. Halleck was within three miles of Corinth at last advices, cautiously approaching the foe. This General, like Gen. McClellan, is prudent and able, and knows that it will not do to rush pell-mell upon the foe, but must approach cautiously and carefully, to guard against surprise. At the very hour that we now write half a million of men may be fighting. We contemplate such a struggle with horror, confident, however, that we shall triumph.

A GALLANT NAVAL EXPLOIT.

Wherever the armies of the United States have advanced it has usually found warm friends in the colored population, and, could all the events of the war be faithfully chronicled, it would appear that those people have furnished our officers with much valuable information, while it cannot be denied that they have often been used as spies against us.

Commodore Dupont reports a most gallant exploit on the part of eight negroes in the running out of Charleston harbor an armed vessel--the *Planter*--and surrendering her to the Federal blockading squadron. Commodore Dupont, in his report to the Secretary of the Navy, gives the following account of the matter: "At four in the morning, in the absence of the captain, who was on shore, she left her wharf, close to the government office and headquarters, with the Palmetto and Confederate flags flying--passed the successive forts, saluted as usual by blowing the steam whistle. After getting beyond the range of the last gun she hauled down the rebel flag and hoisted a white one. The *Oswald* was the inside ship of the blockading squadron in the main channel, and was preparing to fire, when her commander made out the white flag. The armature of the steamer is a 32-pounder or pivot, and a fine 24-pounder howitzer. She has, beside, on her deck four other guns--one a

7-inch rifled--which were to be taken on the morning of the escape to the new fort on the middle ground. One of the four belonged to Fort Sumter, and had been struck, in the rebel attack on the fort, on the muzzle. Robert Small, the intelligent slave and pilot of the boat, who performed this bold feat so skillfully, informed me of this fact, presuming it would be a matter of interest to us to have possession of this gun. This man, Robert Small, is superior to any who have come into our lines, intelligent as many of them have been. His information has been most interesting, and portions of it of the utmost importance."

GUNBOAT OPERATIONS ON THE JAMES RIVER.

The James River is now clear of obstruction to within seven or eight miles of Richmond. At that point there is a heavy battery mounted on a high bluff, and the river is temporarily closed to navigation by sunken vessels, piles, chains, &c. In a recent attempt of our iron-plated gunboats--the *Monitor* and *Galena*--to pass this point they were temporarily prevented by these obstacles.

It appears that an attempt was made by the gunboats to remove these obstructions, under a fatal fire from the fort, which was able to pour its shot with accuracy down upon them, while they could not reply with much effect. This fort can only be reached with mortars: but if the obstructions could be dragged out of the channel the gunboats might easily pass the fort and have the city of Richmond at their mercy. The *Galena* and *Monitor*--which alone could be effective at short range--could not elevate their guns sufficiently to be of service in reducing the battery. No land force accompanied the squadron, and hence, as the place is totally unfavorable for a naval attack, it could not be taken. The vulnerable part of iron-clad boats is their deck plating, which, being only one inch thick, is penetrable by the largest shot by a plunging fire from an elevated position. The wooden vessels were wholly incapable of assisting in the reduction of the fort. Unless the fort has been captured by this time it will probably impede the passage of our boats quite seriously, except it be flanked. The first shot of the enemy's gun rolled off the sides of the *Galena*, making only dents in her mail, but gradually, after five hours fighting, it was found that the steel pointed balls used by him were piercing her. Thirty shots struck her and lodged, while two went entirely through her, tumbling out on the other side. The *Monitor*, however, maintained her superior strength and invulnerability. The balls glanced harmless from her tower of strength and fell into the placid waters of the river. The small gunboat *Naugahock*, fitted up by E. A. Stevens, of Hoboken, to illustrate in some degree the large battery which he is trying to complete, accompanied the expedition, and carried a single rifled gun--a 100-pounder Parrott. Shortly after being brought into action this gun burst, and the vessel was obliged to withdraw. It is expected that the attack will be speedily renewed by a more formidable force, including mortar boats, which can operate with more success upon such elevated points than can gunboats.

THE PRESIDENT ON GEN. HUNTER'S PROCLAMATION.

Gen. Hunter, commander of the department embracing South Carolina, Georgia and Florida, issued a proclamation on the 9th inst., declaring the slaves of those States forever free. The President has taken the matter in hand, and has declared Gen. Hunter's act null and void, and, in order that there may be no future interference with his authority on this point, the President announces the following to be his position: "I further make known, that whether it be competent for me, as Commander-in-Chief of the army and navy, to declare the slaves of any State or States free; and whether at any time, or in any case, it shall have become a necessity indispensable to the maintenance of the government to exercise such supposed power, are questions which, under my responsibility, I reserve to myself, and which I cannot feel justified in leaving to the decision of commanders in the field. These are totally different questions from those of police regulations in armies and camps."

We are glad to know that the President has finally entered his caveat as an admonition to all military commanders to attend strictly to their duties. Let them attack the enemy boldly and vigorously, and leave all questions of civil policy to be settled by the government. Some few of our generals have made fools of themselves by their silly and ridiculous pro-

clamations, even before they were sure of holding the ground on which they stood.

PONTOON BRIDGES.

The Fredericksburgh correspondent of the *Philadelphia Inquirer* says:--The pontoon bridge across the Rappahannock, at this place, is one of the greatest inventions of the age. The pieces are numbered, and together with the gutta-percha floats, are carried in wagons from stream to stream. The corps attached to the pontoon have become so perfect in their laying of the bridge that a stream, the width of the Rappahannock, can be crossed by the bridge in a few minutes. We have just witnessed some practice with another bridge than that already laid down, and the performance is really wonderful. The government is now repairing the railroad bridge over the Rappahannock, and in a few days the cars will be enabled to run from Aquia Creek into the city of Fredericksburgh.

MILITARY TELEGRAPH CABLE SUCCESSFULLY LAID.

The submarine telegraph cable was successfully laid on the 19th inst., across the Chesapeake Bay, from Cherry Stone to Back River in Virginia, and the War Department is now in telegraphic communication with Fortress Monroe and Gen. McClellan's headquarters.

The cable, twenty five miles in length, is heavily armored with sixteen stout iron wires, arranged longitudinally, like the staves of a barrel around the insulating coat and conductor, and protecting them from all strain by any force short of what would be required to break the covering wires, the aggregate strength of which equals that of a ship's chain cable.

The longitudinal wires are hooped by a still heavier wire, wound spirally round them, which binds them together so that they form a strong but flexible tube of iron that effectually protects the conductor and the insulating coat. This is deemed a great improvement over the English system of spiral wire armor which was used in the Atlantic cable, and tended so strongly and incorrigibly to twist and kink.

At the time of laying the first temporary cable, there was no heavy cable in this country, or machinery for its expeditious manufacture. The experiment was made with such cable as could be extemporized at the moment, and which was constructed like the English cable, 370 miles in length, laid in the Black Sea, between Varna and Balaklava, during the Crimean war, and which worked so admirably for several months.

The temporary cable worked successfully, and most opportunely to relieve the public mind on the memorable Sunday of the battle between the *Monitor* and the *Merrimac*, but in a few days was dragged away by anchors, or otherwise broken--an accident not likely to happen to a cable of such immense strength as the new one.

The present cable was manufactured in New York, under the orders of Col. Anson Stager, Military Superintendent of United States Telegraphs, and was laid in four hours, under the supervision of Mr. Wm. H. Heiss, who also superintended its manufacture. A brake of novel construction was used to govern the paying out of the cable, and worked so admirably that it is thought it will overcome one of the greatest difficulties experienced in laying the Atlantic cable.

MISCELLANEOUS.

It is stated that the Scientific Board charged with the duty of examining into and reporting upon the merits and prospective advantages of the Stevens battery for harbor defence have made a very strong report against it.

Forty thousand pounds of powder have recently been removed from the hold of the steamship *Bermuda*, a prize steamer now lying in the port of Philadelphia.

The Vicksburgh *Courier* of the 9th inst. announces that cannonading had been heard from our vessel on the previous day at Tunica, which is about fifty miles above Baton Rouge. We shall probably soon hear of the arrival of our gunboats at Memphis.

The *Great Eastern* arrived at this port on Saturday May 17th, after a prosperous voyage. She is again in trouble: the owners having refused to make any recognition of the services of Mr. Towle, in devising the steering apparatus by which she was saved in September last, that gentleman has commenced legal proceedings against her.