

THE FIGHT BETWEEN THE "MERRIMAC" AND "MONITOR."

On Saturday, the 8th of March, the large iron-plated rebel steamer *Merrimac* steamed slowly out of the harbor of Norfolk, and proceeded to Newport News at the mouth of the James river, where some of the old wooden sailing ships of our navy were stationed for the purpose of blockading the river. As she approached, the *Cumberland* a 24-gun sloop-of-war of 1,725 tons, began to fire upon her at long range, but the shot glanced from her inclined iron sides like billiard balls from a cushion. The *Merrimac* held on her course till she came very near the *Cumberland*, when she fired a broadside of her four 11-inch guns, and then drove with full force against the wooden side of the sloop, piercing it with her sharp iron prow, and making a vast rent, through which the water poured in torrents into the helpless vessel. Drawing off and firing another broadside, she came again, this time against the waist of the sloop, and making another fearful chasm in her side.

The *Cumberland* soon went down, carrying a considerable portion of her crew, her flag flying at her mast to the last, and it continued to fly when the keel was resting on the bottom 54 feet beneath the surface of the water. After destroying the *Cumberland* the *Merrimac* turned her attention to the *Congress*, an old 50-gun frigate of 1,867 tons. The commander of the *Congress* soon saw that his craft was utterly helpless against the destructive shot and shell of the *Merrimac*, and he was reduced to that bitterest necessity that ever occurs in the life of a soldier, the pulling down of his flag.

Most opportunely, in the course of the evening, Ericsson's iron-plated steam battery, the *Monitor*, arrived in Hampton Roads. She immediately proceeded to the protection of the stranded *Minnesota*, which, it was not doubted, the *Merrimac* would attack in the morning. In the clear and beautiful Sunday morning of March 9th, the *Merrimac* again proceeded to her work of destruction; but the arrival of the little *Monitor*, with her two 11-inch guns, had materially changed the relative condition of the combatants. At about 8 o'clock the *Merrimac* made her appearance, steaming toward the *Minnesota*, apparently without observing the little lion that lay in her path. When she arrived within about a mile, the *Monitor* fired one of her guns, the shot striking the *Merrimac*, but glancing harmless from her inclined plates. The *Merrimac* slackened her speed, but continued to approach. When she arrived within a quarter of a mile of the *Monitor* both iron-clad vessels began to cannonade each other with all their might; still drawing more nearly together. This novel naval duel was witnessed by thousands who crowded the vessels and lined the docks in the vicinity. The vessels finally approached each other so closely that they were both covered by the same dense cloud of smoke.

The *Monitor* sailed round and round her antagonist, seeking some vulnerable spot, and, it is said, succeeded in driving a shot through the sides of the *Merrimac*, below the iron plates. At all events the *Merrimac* drew off to Craney Island, where she was soon surrounded by the rebel gunboats.

This is the first conflict that has ever taken place between iron-plated ships, and it was certainly one of the most exciting that is recorded in the annals of naval warfare.

We have received the following letter from Mr. Keeler, Assistant Paymaster, which describes the effects of the shot on the *Monitor*:—

U. S. STEAMER "MONITOR," }
Hampton Roads, March 11, 1862. }

MESSRS. EDITORS:—As it may be some time before the official report of Chief Engineer Stimers is made public, I have thought that the effects of the shot on our vessel in the late engagement with the *Merrimac* might be interesting to you. The details of the fight, which lasted three hours and a half, have already been made public, so that I will confine myself to the effect of the shot upon us.

The *Merrimac's* projectiles were mostly percussion shells, fired from ten or eleven-inch rifled pieces. Twenty-three shot struck us, including two from the *Minnesota*, which, during the engagement, fired over our heads. The deepest indentation on our turret was two and one half inches, produced by a 150-lb. percussion shell fired at a distance of twenty feet per-

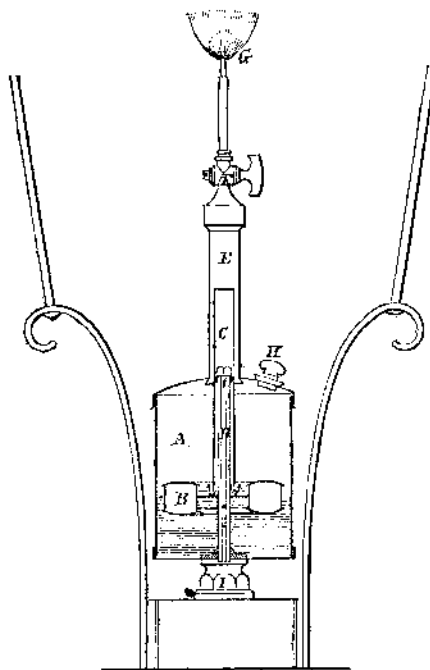
pendicular with the side. Our deck received four shot making slight depressions. One shot struck us on the angle formed by the deck and side, tearing up the iron plating about one-third the width of a sheet, starting the bolts and splintering the wood a little. Three or four others struck us just above the water line, with no other effect than making indentations of two inches. The pilot house received one shot on one of the upper corners, nearly battering it down. A little later in the action, however, a heavy shell was thrown from a distance of about fifteen feet, against the front, at an angle of about thirty degrees, striking the two upper bars just at the lookout crack, the main force being on the lower of the two, forcing it in about an inch, and opening a crack of one-fourth of an inch on the opposite side. She twice attempted to open a hole in our side with her ram, as she did the *Cumberland*, once striking us squarely on our beam, nearly abreast of the turret, jarring us somewhat, and leaving a small dent on our iron side. Our hull remains perfectly tight, and the turret, notwithstanding the severe hammering, revolves as accurately and easily as when we left New York.

We experienced a severe gale on our way down, coming through it safely. That, and our trial with the *Merrimac* proves the *Monitor*, we think, a success.

W. F. KEELER,
A. A. Paymaster.

CARBURETING APPARATUS FOR STREET LAMPS.

Many years ago it was discovered that the common gas employed in street and other lamps, when brought into contact with naphtha, absorbed some of this hydro-carbon liquid and became more luminous. Vari-



ous attempts have been made to naphthalize gas for public illumination, but hitherto they have all failed of practical success. The accompanying engraving, which is a section view, represents Mr. Shepard's patent naphthalizing apparatus which has lately been applied to street lamps, as described in the *Journal of Gas Lighting*, London, and which is stated to be an improvement of considerable importance.

Each burner may be provided with its own carburetor situated near the burner, or at some distance, as may be most convenient; or several burners may be provided with one carburetor. A float composed of cork, wood, tin, or other suitable material is employed; this float is placed on the surface of the liquid, and it supports an upright tube which is closed at the top; into this tube the gas is admitted by the supply-pipe passing up the interior of the tube whereby the current of gas, before passing to the burner, is made to play on the surface of the naphtha, and is rendered uniform at whatever level the surface of the carbureting liquid may be. Where the carbureting liquid is poured into the vessel, a piece of fine wire gauze should be inserted directly under the mouth or hole where the liquid is poured in, and a piece should also be placed inside the tube which conducts the gas to the burner.

A is a reservoir or vessel for holding the naphtha or carbureting liquid; B is the float, and C the tube supported thereby. This tube is closed as its upper end; the gas is consequently caused to descend down and to strike against the surface of the naphtha or carbureting liquid. The gas escapes through wire gauze attached to the lower end of the tube, C; D is the gas supply-pipe by which the gas is conducted up the tube, C; E is the upper gas pipe, through which the gas and vapor rise to the burner; F is the stopcock between the burner and the vessel, A; G is the burner. H is the hole or mouth for introducing the carbureting liquid into the reservoir, A; the same is closed with a screw plug, and just under the hole, H, inside, is put a piece of wire gauze. I is the junction of the gas supply pipe, D, with the gas pipe interior of the post. In the above description, only one gas burner is mentioned as applied to a street lamp, and the carbureting apparatus is placed very near thereto; but it will be evident that similar apparatus may be employed for carbureting gas for several burners, and the carbureting apparatus, whether for one or several burners, may, when desired, be placed at a greater distance from the burner or burners. It is, however, desirable that the carbureting apparatus should be as near as may be to the burner or burners, in order to prevent any condensation of the carbureting vapor. This subject is now exciting a great deal of public attention in London.

Manufacture of Iron and Steel by Electricity.

Mr. A. L. Fleury, of Philadelphia, is now engaged at the Pennsylvania Iron Works, Danville, Pa., in testing his new method of applying induced electricity in the manufacture of iron, which has before been noticed in the *SCIENTIFIC AMERICAN*. His apparatus for producing the required quantity of electricity for so great a mass of metal proved insufficient, and it became necessary to procure a larger one. For that purpose he went to Binghamton, N. Y., where he procured a powerful magneto-electric machine from Hon. John A. Collier, President of the magneto-electric Company of New York, with which he is now about to make the interesting experiment at the furnaces of the above company. These machines are used for electrotyping, for producing the most intense electric light, which penetrates through fogs, and can be used also for submarine purposes; for the successful decomposition of water, the production of hydrogen and oxygen, for the smelting of all kinds of ores, for the manufacture of iron and steel, and numerous other purposes. These machines, driven by steam power, are of very simple construction, devoid of complexity, and not liable to wear and derangement.

The employment of electricity in the manufacture of iron is one of great interest, and the result of these experiments will be anxiously looked for.

Plating Porcelain and Platinum.

We translate the following article, by Dr. Elsner, from *L'Invention*:—

Triturate platinum black, prepared by any of the known processes, with the essence of turpentine, and apply the mixture with a pencil on the piece of porcelain to be plated, cold. Inclose the piece in a sagger and expose it to the strongest heat of a porcelain furnace. After cooling it will be found covered with a thick plate of brilliant platinum. The platinum black, which is simply platinum in the state of a very fine powder, when exposed to the strongest fire of a porcelain furnace, forms a metallic mass which under the microscope exhibits rounded angles closely resembling native platinum. Vases lined with platinum by this method may be employed in chemical operations and in the arts in place of platinum vessels. One of the best means of preparing platinum black is that of Professor Bottger, which consists in precipitating the chloride of platinum by boiling it a few minutes with a little glucose and carbonate of soda, and then washing the precipitate on a filter and drying it at the ordinary temperature.

COTTON IN ENGLAND.—By the latest arrivals from England we learn that the prices of cotton have advanced in Liverpool, and the market is buoyant. Fair Orleans was selling at 14½ pence (28 cents) per lb., and Middling Uplands at 12½ pence. No less than 80,000 bales were sold during the week preceding the 21st of February.