A MODEL TRANSATLANTIC STEAMER.

We have heard it asserted that there is scarcely a steamer crossing the Atlantic that could not be sunk by a few blows from a heavy sledge. We have received ample evidence, in recent ocean disasters, that the action of the waves alone may strain a modern vessel so that she is considered unseaworthy by a modern captain. Such matters are of grave interest to the traveling public, and they may be glad to know that it is possible to build vessels that will be able to withstand much more severe usage. In the early days of iron shipbuilding, it was pointed out, by the best authorities, that the way to make a vessel safe and strong was to build it with a double skin, making, as it were, a ship within a ship. One of the most noted vessels of modern times, the Great Eastern, was constructed in this manner, and our readers may remember that she ran aground in New York harbor, tearing a hole in her outer skin something more than eighty feet long, and that it was not even necessary to dock the vessel to repair the damage. Of course, a vessel built in this manner is much more expensive than one of the ordinary construction, and it is scarcely necessary to remark that very few examples of this kind are to be found in the mercantile marine. Steamship owners and the traveling community seem in general to have opposing interests, the former desiring to build and run vessels as cheaply as possible, while the latter are more interested in the strength of the ship and the efficiency of the officers. It is with great pleasure, then, that we call the attention of our readers to an exceptional case, that of a company which seems disposed to use the best vessels that can be built, regardless of cost. We refer to the company operating the Red Star line of steamers, formerly running from Philadelphia to Antwerp, which have recently changed their place of sailing to this port. Only three vessels of this line, the Nederland, the Vaterland, and the Switzerland, are as yet completed, but several others are in course of construction. Our readers may remember that not long ago the Nederland ran ashore on the New Jersey coast, in making what appeared to be an effort to reach Philadelphia overland, and that, after having been aground for about two days and exposed to a pretty severe storm, she was floated again and taken to Philadelphia, apparently uninjured. We need scarcely remark that not every steamer crossing the Atlantic could be expected to behave as well under such circumstances. The Switzerland, the other vessel belonging to this line, reached New York on the 8th instant, this being her first voyage. She is 350 feet long, 40 feet beam, has 33 feet depth of hold, and is of about 2,800 tuns burden. The vessel is divided by bulkheads into 6 watertight compartments. Each bulkhead is composed of two thicknesses of plate, with a space between, the plates being strongly stayed together. The ship has a double skin, the distance between the outer and inner skins being between 18 and 20 inches, the main and berth decks being built double, in the same manner. The main deck is covered with heavy planks, and the inner skin of the vessel is sheathed with wood. These compartments between the skins are fitted with good sized pumps which can be worked either by hand or by engines on the upper deck. The steam pumps in the engine room are unusually large for a vessel of this size, and it would seem as if nearly every safeguard that could be required, in case of a leak, was provided in the present instance. The door of each watertight compartment can be closed from the upper deck, by means of a screw.

The Switzerland has a compound engine, the length of stroke being 48 inches, and the diameters of the two cylinders, 40 and 80 inches. There are accommodations for 160 first class passengers, and for about 900 in the steerage.

Without going very fully into details, we trust that we have shown that the vessel under consideration is one of the most substantial crafts that can be built, and offers security to passengers that cannot be guaranteed in the case of the ocean steamer as ordinarily constructed. Our readers may rest assured, also, that, when ocean travelers demand such safeguards to be provided on all lines, they will be forthcoming, and not before.

LEFT HAND WRITING.

A correspondent asks for the best way of holding the pen in writing with the left hand, and the best angle of slope for the letters. No absolute answer can be given in either case. Hands differ, and what would be an easy position of pen for one person might be a very awkward one for another. Each writer must by governed by the necessities of his individual case, to be discovered rather by thoughtful observation of his own writing than by the study of rules. It is enough to say that the ideal position figured on the covers of copy books can be maintained but for short periods without excessive fatigue, and only by persons having slender hands. It answers well enough for writing as a fine art, but is altogether too stiff and tiresome when much offhand writing is to be done. What is true for the right hand is equally true for the left. A good deal depends, too, on the mode of writing, whether the motion is a wrist stroke or a finger stroke or a combination of the two.

Equal freedom must be allowed in regard to the angle or slope of the writing, prevising simply that the greater the departure from the perpendicular the greater the danger of illegibility; while a slight slope to right or left adds much to the gracefulness of the script without making it perceptibly less easy to read.

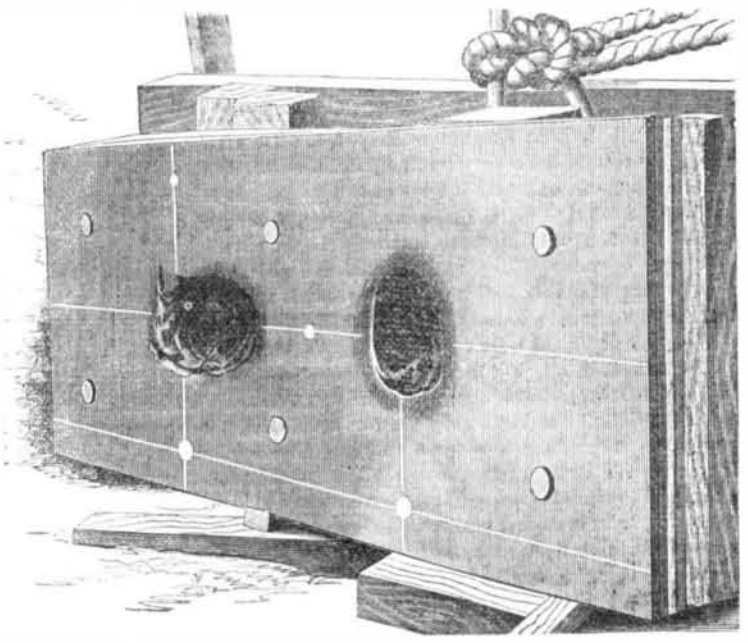
In writing with the left hand, the easiest position would seem to be with the body square before the table, the arm making an angle of about forty-five degrees with the front line of the table, the line of writing being at right angles with the direction of the arm. In this position the writing is naturally "back hand," about twenty degrees from perpendicular. To the present writer, whose left hand practice began rather late in life, in consequence of an accident which threatened the disabling of the right hand, it is much the easiest way, in left hand writing, to hold the pen reporter-fashion between the first and second fingers, as in this position the pen is held steady with the least effort, and is not so likely to wander from a uniform slope. It is well, however, to accustom one's self to a variety of positions, especially when much writing has to be done, since, by changing the posture, the labor of writing may be thrown on different sets of muscles, and rest obtained without ceasing to write.

One of the clearest and most graceful left hand writers of our acquaintance writes a style that cannot be distinguished, save in a slight peculiarity in shading, from normal right hand penmanship. To one watching the process, the writing appears to be done upside down. The pen is held between the thumb and forefinger in the regular way; but the paper is placed so that the line of writing is perpendicular to the front of the body, the direction of the writing being toward the body. It seems most natural, however, for the writing to slope to the left when the left hand is employed.

There is a special advantage in using the left hand to write with, and one that we have never seen commended. The hand is never in the way of vision. The pen point is always in plain sight, and so is the paper to be written on. There is, consequently, no inducement to stoop forward or to turn the head so as to throw the eyes out of focus. It is a common fault with those who write much that the left eye has a shorter range than the right. It is overworked and compelled to adapt itself to nearer vision. In writing with the left hand, these evils are avoided. An upright posture is the easiest, and the eyes are equally distant from the paper.

RUBBER AS A DEFENSIVE ARMOR.

We have before us a petition for the relief of Jonathan L. Jones, recently submitted to Congress, in which the memorialist prefers a claim against the United States for the sum of $500,000 for compensation for the use of his patent dated April 15, 1862, for improved defensive armor upon the gunboats Essex, Choctaw, and Lafayette, in their operations against Vicksburgh and the Confederate batteries on the Mississippi river during the late war. This armor was composed of one inch of iron plating, backed by one inch of vulcanized india rubber and twenty-three inches of solid timber, covering the portions of the hulls abreast the boilers, the forward and after casemates, and the pilot houses. Thus protected, the boats went repeatedly into action, passing Vicksburgh, destroying the ram Arkansas, and participating in other engagements, during the course of which they were struck, it is alleged, by heavy projectiles, an aggregate of 276 times without the same penetrating that portion of the armor constructed on the memorialist's plan. Shot, it is admitted, passed into the vessels at various times, but never through the parts protected by the armor. A host of letters affidavits, etc., are submitted in corroboration of the assertions advanced; and with the apparently plain claim nicely made out, Mr. Jones goes in for the above mentioned grab. It forcibly reminds us of the efforts of the claimant in the famous Tichborne case.



On the 3rd of October, 1863, Mr. Jones' own target, made of materials furnished by himself, consisting of four one inch wrought iron plates and four sheets of rubber one inch thick, backed by twenty inches of solid oak, was set up against a clay bank in the Washington Navy Yard. The first four inches of the shield nearest the timber were composed of alternate layers of rubber and iron; and the two sheets of one inch rubber and two one inch wrought iron plates were added, the latter being on the outside of the target. The first shot, weighing 169 lbs., was fired from a 11 inch gun at 84 feet distance. It went entirely through plates, rubber, and timber, and penetrated the bank a distance of 12 feet. Diameter of shot hole, 11½ inches. On the 6th of October, the target was placed at an angle of 45° to the line of fire, and a similar shot fired at it. The ball again penetrated everything and entered 6 feet into the clay bank. The holes made by the shot are shown in the annexed engraving, made from the target at the time and published in the SCIENTIFIC AMERICAN. In order fully to prove the inefficiency of Mr. Jones' shield, another target was made, of simply 4 one inch iron plates, backed by 20 inches of solid oak, for comparison, to indicate the effect of the rubber. The first shot fired under similar circumstances to the above went through and penetrated the bank 5 feet. The second projectile, at an angle of 45°, broke in pieces and glanced off, leaving a fragment in the plating. If the members of the committee to whom Mr. Jones' claim has been relegated desire further evidence, we would refer them to the files of the Ordnance Bureau in the Navy Department, as to the detailed account of the tests conducted upon targets Nos. 45 and 46 in the Pencote battery. Further, a year before Mr. Jones produced the above mentioned shield, which failed so conspicuously, a Mr. Bennett, of New York, furnished a rubber plate one inch thick, for target No. 10 in the same series of experiments, and this also was repeatedly penetrated, according to the official report "the same as by previous shots fired at other targets made in the usual way without rubber." Target No. 18 was made of two thicknesses of one inch wrought iron plates backed by 1¼ inches of rubber, 7 inches of yellow pine, and three beams 12 inches square running lengthwise the shield. The shot tore through the plating and rubber as before and penetrated the bank for 17 feet. Target No. 21 had two inches of rubber between two one inch iron plates and 7 inches of pine, with beams as before. This was pierced with equal facility by two shots. Target No. 37 was faced with 4 one inch rubber plates and backed with 4½ inches of scrap iron and 20 inches of oak. All the rubber was forced off. Trials at similar targets without the rubber proved the latter to be of no value.

It would be idle for us to proceed further in disproving Mr. Jones' assertions. Leaving out the above experiments altogether, it is a very simple matter to show that even theoretically the inventor's ideas are false. Rubber alone in the form of plates or blocks opposes a resistance to projectiles of about fifty per cent of that of oak. The balls go through it almost as if it were tallow. Now when it is conceded that the shot easily penetrated targets unprovided with the material, it is palpably absurd to suppose that the addition of a substance so easily pierced would add materially to the general resisting power.

That there is any truth in the "philosophy" of the results said to have taken place, namely, that the rubber causes a diffusion of the force through its elasticity, we cannot for a moment admit. As in the converse case of shooting a tallow candle through a door, no time is afforded in the passage of the shot through the single inch of iron for its force to act and react before the penetration is effected.

How Commodore Porter could have been ignorant of the experiments which proved the inefficiency of the rubber, we fail to understand; nor can we reconcile the letters of the officers in its favor in any other manner than by supposing that the results ascribed to the armor must have been due to other causes, a fact which we think would have been apparent had the gentlemen considered the subject in the light of the simplest mechanical laws.

In justice to Mr. Jones, however, it may be added that although his shield could not have repelled the shot, it nevertheless may have served some useful purpose, as the crews of the vessels evidently believed in it; and hence, going into action with a greater confidence in their safety, they perhaps performed better work. This, however, is hardly worth $500,000 to the people.

PHOTOGRAPHY AT THE BOTTOM OF THE SEA.

Dr. Neumayer has recently exhibited before the Berlin Geographical Society a photographic apparatus designed for the determination of the temperature and of the currents at great depths in the ocean.

The invention is composed of a copper box, hermetically sealed and furnished with an exterior appendix made like a rudder. In the interior is a mercury thermometer and a compass, each enclosed in a glass receptacle in which are admitted traces of nitrogen gas. A small electric battery completes the apparatus. When the latter is allowed to descend attached to a sounding line, the action of the current on its rudder causes it to assume a parallel direction, thus indicating the set of the flow by the relative position of compass, needle, and rudder. The thermometer of course shows the surrounding temperature. In order to fix these indications, a piece of photographic paper is suitably disposed near the glass cases containing the instruments. Then at the proper time a current of electricity is established through the gas in the receptacles, causing an intense violet light, capable of acting chemically upon the paper for a sufficient length of time to allow of the photography thereon of the shadows of the compass needle and of the mercury column. Within three minutes, it is said, the operation is complete, when the apparatus is hoisted and the paper removed.

AN AMERICAN RIVER NILE.—The valley of the Rio Grande del Norte, in New Mexico, recalls the features of the Egyptian Nile. A large population is entirely dependent upon the river. An annual rise of the waters carries a muddy sediment, superior in fertilizing properties, as was proved by analysis, to that of the great African river. While the amount of phosphoric acid is nearly the same, the amount of potash is considerably higher. Thousands of acres are lying idle along the valley of the stream, awaiting the enterprising farmer.