Correspondence

How to Pass a Fleet over a River Bar.

MESSRS. EDITORS :—I was just reading an account of the naval expedition down the coast, and that it was to enter the waters of Pamlico Sound, where there was some difficulty expected in passing over the bar, as the water was represented to be only eight feet, while most vessels drew a great deal more. I suggest the following mode for crossing bars :—Let the steamers—say half dozen or more—be lashed together, one immediately behind the other, and advance slowly to the bar, the hindmost one throwing a small anchor over the stern as soon as they enter the soft mud. By holding the boats thus, and keeping the wheels in motion, the soft mud will be drawn from the first boat to the next, and so passed along until it is thrown behind the last in deep water. As the way is cleared the boats can be moved ahead slowly, so as not to compress the soft mud under the bow of the first. In this way, I think, the difficulty can be overcome. I will simply state my reasons for thinking so. I was one of a party, in the fall of 1828, passing from Great Egg Harbor to Little Egg Harbor, and when we came to the bar, the tide being down, six of us could not row our boat through, although we could move the mud quite freely with our oars. I proposed that we should rock the boat gently, at the same time using our oars as paddles, close to the side of the boat. In this way we progressed, and in a short time we were over. J. P.

Dayton, Ohio.

The Motion of Rockets.

MESSRS. EDITORS :—The writer, "Civil Engineer," of an article under this head, in the SCIENTIFIC AMERICAN of Jan. 18th, makes an intricate question of the matter by quoting prominent scientific names on the subject, and concluding by expressing his own opinion that the cause of a rocket's motion is by the resistance of the atmosphere to the issuing gas, and that "it is doubted whether a rocket would ascend at all in a vacuum."

In reply, if a cylinder containing steam, or other gas, be surrounded by air, compressed to the same density, there would be no tendency in the gas to burst off the end, and if the end were removed by some means foreign to the cylinder there would be no tendency to motion. But if the density of the surrounding air be lessened the inclosed gas would become available to give motion, in proportion to the density of the air, and, when in a vacuum, the action would be perfect.

The above writer alludes to the impossibility of propelling a steamboat by an opening in the rear end of the boiler, and conceives his argument strengthened thereby, which is not apparent. However, this is not theoretically impossible, and a speculative paper on the subject was forwarded by me to the *Franklin Journal* about the year 1843-4, at which period I was an occasional contributor.

If the tube leading aft from the boiler were protected from losing heat, and of such (impractical) length that the steam at the end should have expanded down to atmospheric pressure, we should have an efficient and economical steam engine. T. W. B.

Cincinnati, January, 1862.

A Question in Relation to Steam.

MESSRS. EDITORS :—Will you please state your views upon the following through the columns of your paper :—I have a steam heater, consisting of an iron cylinder, inclosed in a jacket, also of iron ; the article to be heated is placed in the cylinder, and steam admitted between the cylinder and jacket ; there is a safety valve on the heater, weighted 10 pounds to the inch ; also, a pipe to admit steam, and one from the bottom to carry off the water of condensation. Both the pipes have throttle valves, so as to keep the pressure at about what the safety valve will hold down, viz., 10 pounds per inch. Under certain unfavorable circumstances the heater will not heat fast enough, and the question is, will it heat more rapidly if the pressure in the boiler is raised from 40 pounds (the present pressure) to 50 or 60 pounds per inch—the steam after passing into the heater of course falling down to 10 pounds, the highest pressure admissible there? J. J. B.

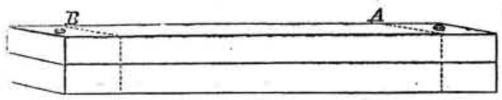
Burlington, Iowa, Jan. 18, 1862.

[Steam at 10 pounds pressure must always be at a temperature of 240°, provided it is heated through the water; but if our correspondent will carry his pipe through the fire, so as to superheat his steam, he may have his steam at any temperature that he pleases with a pressure of 10 pounds to the inch.—EDS.

Making Core Boxes for Casting.

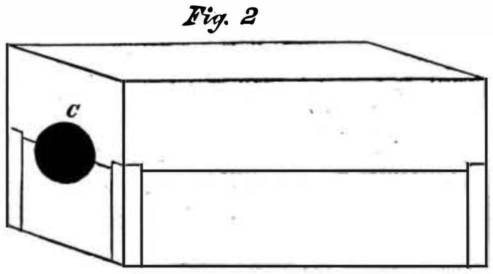
MESSRS. EDITORS :—The following is a description of a method which I employ to obtain core boxes for small castings. By the mode described, the form of the cavity intended for the core is very exactly and easily obtained. I will endeavor to make it intelli-

Fig. 1



gible by describing the mode of making a core box for the core of a tube, two inches in length and one-half of an inch in diameter. I screw together near their ends, two pieces of wood, four inches long, one-half an inch wide and one-quarter of an inch thick. Centering it at the joint I turn the united pieces to within one-half an inch of each end, that is to say, three inches of the same, down to the diameter of the tube (one-half of an inch), and cut off the unturned ends, all of which is explained by the figure below, A B between the dotted lines being the space representing the part turned. I then lay one of these half-round pieces on a smooth board, flat surface down, and upon it I lay a flask of the same length, namely, three inches, one inch wide and three-quarters of an inch deep, as represented by figure 2. Having oiled

Fig. 2



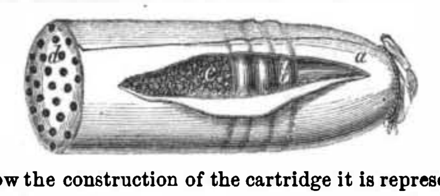
the upper side of the pattern I fill the flask with fluid plaster of Paris. When this has hardened I remove the flask and lay the other half of the pattern on the half imbedded in the plaster, and on it place another flask of the same dimensions as the first, and like it, having semicircular notches in its ends to fit the pattern. After oiling the surfaces of the pattern and of the first cast of plaster, I fill the second as before with fluid plaster of Paris. When this latter cast has hardened, I separate the two flasks, and removing the pattern from each they form the core box (adjusted by means of splints upon the sides and ends) in which a core can be molded, as at C, of sufficient length for the tube and for half an inch to support each end in the sand mold at the foundry.

Other shapes than circular may be obtained by the same method, which will often save much time, produce an improved core box and facilitate its manufacture. T. M. COFFIN.

Plymouth, Mass., Jan. 11, 1862.

RICHARD'S IMPROVED CARTRIDGE.

The powder for loading muskets for use in the battle field is always measured out in quantities sufficient for a single charge, which is inclosed in a paper wrapper and attached to the bullet, the whole forming a cartridge. In loading, the soldier bites off or opens the end of the cartridge, so that he may pour the powder into his musket, after which he drives down the ball and the paper of the cartridge with his ramrod. The biting of the cartridges often produces serious injuries. In the first place it makes the mouth very dry, causing in long battles extreme thirst. The powder is apt to make sores in the mouth, and is very injurious to the front teeth ; not unfrequently disabling the soldier for the performance of his duties. These inconveniences have long been recognized by army officers, and many efforts have been made to devise a cartridge which would not require to be bitten in loading, and several contrivances have been invented for cutting off the cartridge. The annexed cut represents one of the latest of the plans of forming a cartridge to obviate the necessity of tearing the paper at the end of the cartridge with numerous holes, so that the flame from the percussion cap may reach the powder without having the paper torn. To



show the construction of the cartridge it is represented with a little slit in the paper. The paper, *a*, beyond the base of which it extends a sufficient distance to form a receptacle for the powder, *c*. The end, *d*, of the cartridge is perforated with holes which are two small to permit the escape of the powder, but which will readily admit the flame from the percussion cap.

Application for a patent for this invention has been made, through the Scientific American Patent Agency, and further information in relation to it may be obtained by addressing the inventors, T. C. Richards, at Milwaukie, Wis.

THE CHEMISTRY OF COAL.

Number III.

THE THREE SERIES.

The substances resulting from the destructive distillation of coal vary with the temperature at which the distillation takes place. There are three series of these substances, each series the result of a peculiar distillation, which are at the present time occupying a large share of the attention of the civilized world. The first is formed in making illuminating gas, the second in the manufacture of coal oil, and the third constitutes petroleum or rock oil. Illuminating gas is produced at a bright cherry-red heat, about 1,400° Fah., coal oil at a temperature of 650° to 700°, and petroleum under conditions which have not been ascertained.

Of these three series only one has received any considerable examination—the series formed in the manufacture of illuminating gas. Coal oil, illuminating gas and petroleum are all composed of mixtures of various hydrocarbons. Hydrogen and carbon combine with each other in a great number of proportions, far greater than any other two elements, forming a corresponding number of substances varying very materially from each other in many of their properties. There is no class of substances in nature more interesting than the hydrocarbons, and as the production of these is the primary object in the distillation of coal, we propose to give considerable space in these articles to their examination, and as those produced in the manufacture of gas are the only ones that have been investigated, our attention must be confined to them. We shall reserve their examination for our next article, merely remarking at this time that they differ from the hydrocarbons which constitute either coal oil or petroleum. For instance, one of the most interesting and valuable of all the hydrocarbons in the coal-gas series is benzole. It is not only applicable to a variety of uses when isolated, but it is the substance from which the brilliant dyes solferino, magenta, &c., are made. There is a volatile hydrocarbon in petroleum, assimilating benzole in some of its properties, but it is not benzole, neither is there any benzole in coal oil, if the retorts are kept at the usual low temperature of 650° to 700° during the distillation. In our next article we shall describe briefly the mode of distilling coal for the manufacture of gas, and shall afterward proceed to an examination of the products.

AN INVENTION OF THE CAMP.—We have in our possession a very clear working drawing of a firearm invented in the camp of one of the New York regiments. The drawing was not only done in camp, but the drawing pen with which it was executed was made there also from a piece of sheet iron obtained from the armorer of the regiment.

A COMPANY with a capital of $250,000 has been formed in England for cultivating cotton in Queensland ; another with a capital of $1,000,000 for cultivating cotton in Venezuela, and another, with a capital of $250,000, for cultivating it in Natal.