THE ADAMS GAS PROCESS.

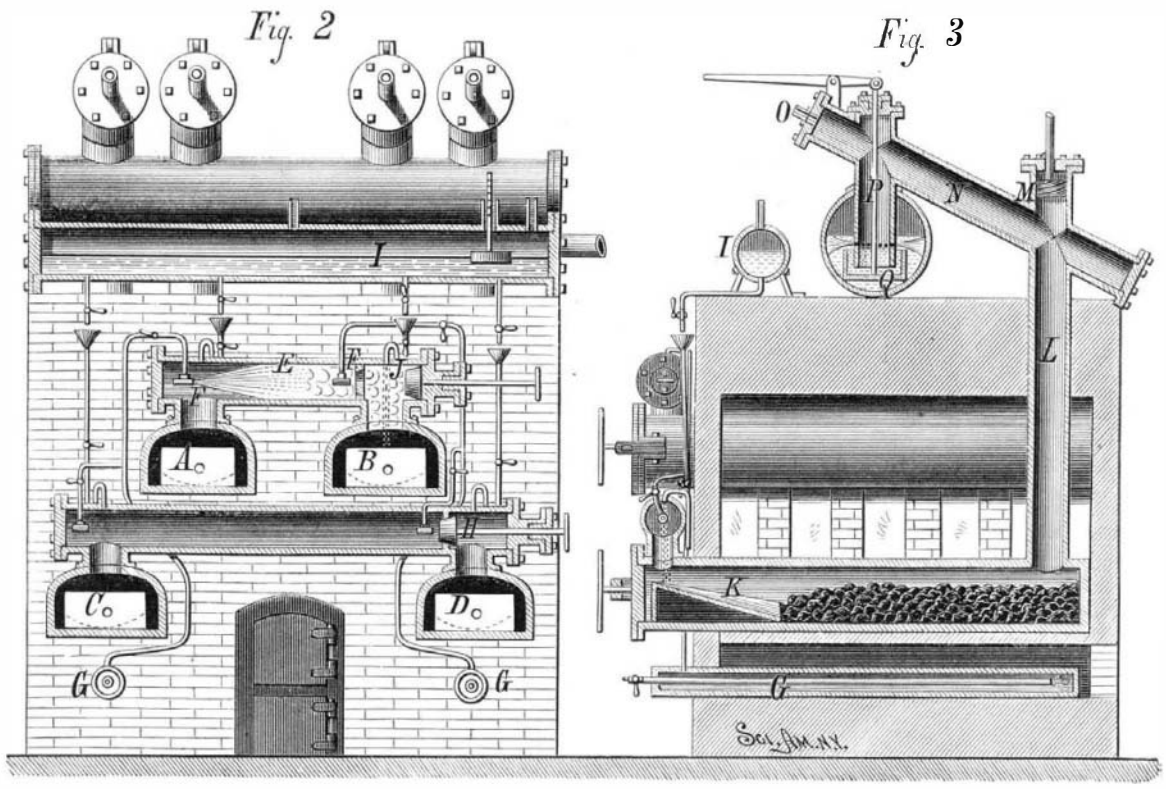
[*Continued from first page.*]

lar cutter shown at M is employed. At N are the saddle pipes, provided with steam pipes, O, for conducting steam through them to cleanse them.

In order to remove the fine particles of carbon which the gas contains, it is caused to bubble through the liquid which seals the dip pipes, P, in the hydraulic main. To this end a ring of holes is made near the end of the dip pipe, and the main is filled with water and gelatin or other gummy substance until the fluid level is above the holes. The gas forces down through this liquid and escapes in jets from the orifices. By means of buckets arranged under the ends of the pipes, as shown at Q, Fig. 3, the holes may be closed. and the gas generated in one retort may be turned into another.

Professor Adams has provided exceedingly ingenious arrangements for washing his gas which we have not space to describe, but which may be seen in operation at the model works above referred to. It will be observed that a large number of new and different devices are here embodied, so that the entire process is novel and interesting apart from its economical advantages.

The invention has been patented through the Scientific American Patent Agency in the United States and all the principal foreign countries. For further information address the inventor as above. He invites all gas companies and gas engineers to visit his works, and see a full demonstration of the rapidity and economy of his system of gas making, by which he unites the gases from coal, petroleum, and water into a fixed gas of dazzling whiteness and brilliancy.



SECTIONAL VIEWS OF ADAMS' GAS RETORTS.

UNSINKABLE STEAM VESSELS.

We take from the London *Graphic* the annexed engraving of a new steel vessel devised by Mr. Edmund Thompson, and claimed to be "unsinkable." This he proposes to accomplish by constructing a cellular frame of thin flanged steel plates, so arranged as to form a series of cells not exceeding 6 feet in dimensions, forming, in fact, a "honeycomb" side, which, when plated over on the inner and outer face, and properly strengthened by longitudinal ties or braces, will afford the greatest strength, with the least possible weight of material, and, in addition, from the inclosed air spaces surrounding the vessel's hull, will give such an enormous lifting power that armor plate of greatly increased thickness may be safely carried, if placed, as proposed by the inventor, within the inner frame, and not, as at present, external to the vessel's side. The advantage of this plan is equally applicable to merchant vessels, as the cargo will be kept free of the sides of the vessel, whereby the tendency to roll or capsize will in both cases be reduced to a minimum. The trunking up of the hatchways, and carrying the transverse bulkheads up to the upper deck, are also proposed, and therefore the effect of an accident either from fire or water would be localized to the compartment affected.

Mr. Thompson's plans of building are applicable either to double or to single ships, or to a modification proposed by him of having a single forward hull, but the after-end tunneled so as to form a double body, between which the screw could be placed about one fourth the ship's length from the stern, completely securing it from injury from shot or wreckage, as well as obviating "slip" and "racing" of the propeller.

Our illustration shows a raft, supported on two pontoons, built on the "cellular" principle, carrying a heavy battery (three feet in thickness where requisite) and an armament, consisting of one 100 ton gun and two 38 ton guns, propelled by two or four screws working between the pontoons, which will only draw six feet of water, the dimensions of the vessel being 400 feet in length by 80 feet in breadth. By reversing either the forward or after screws, the vessel would turn on her own "center," affording that special desideratum, an "all round fire."

The other vessel shown in our illustration is a torpedo boat, with cellular sides, and the screw placed in a tunnel, as before described. This boat would be fitted with noiseless engines, and, by filling the air tubes of the cellular sides with water, could be submerged almost to the water line, to enable her to approach an enemy with slight risk of detection.

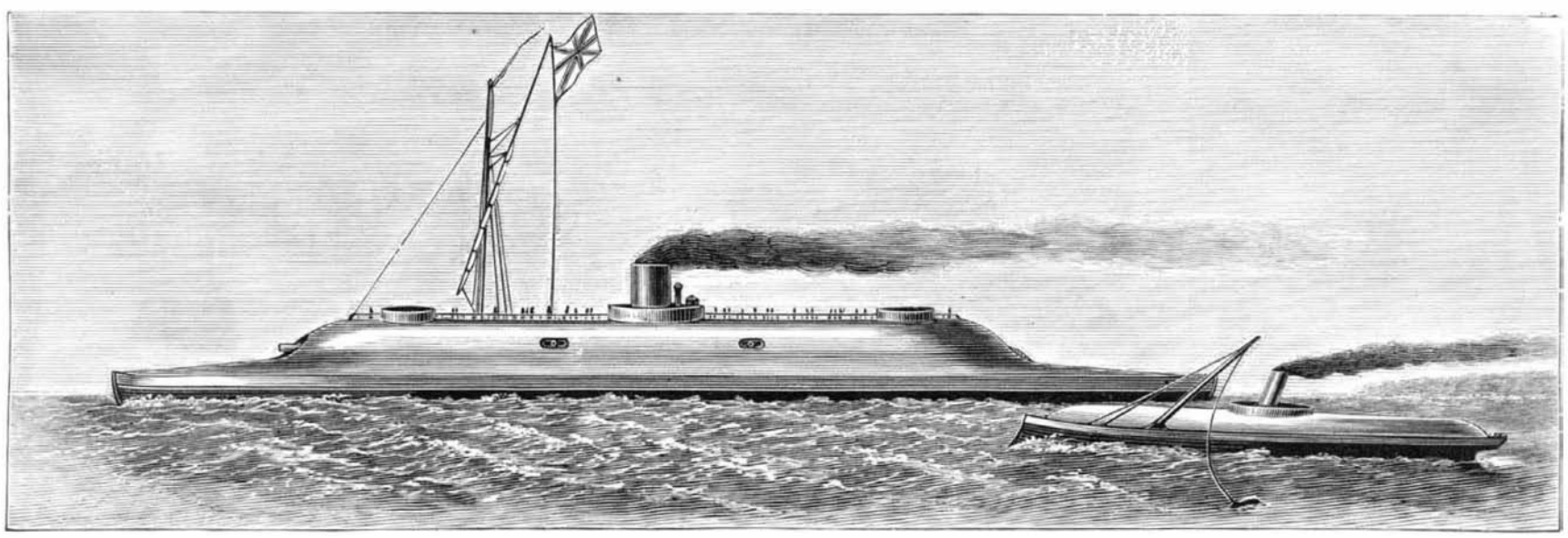
Our Naval Tubs.

The *Army and Navy Journal* says: "Of our Asiatic fleet, a correspondent writes as follows: 'Reports from our ships in Japan and Chinese waters are not encouraging. The Tennessee left for home in March. Under favorable circumstances she can steam eight knots an hour, but her consumption of coal to maintain that speed is as great, if not greater, than the ordinary simple engines would require. The Ranger, one of the additions to the navy under the Eight Sloop Bill, is a failure so far as the compound engines are concerned. She can steam, under favorable circumstances, seven knots per hour, and on her cruise to Formosa, against a very moderate monsoon, she made fifty miles one day and one hundred the next. The Alert, another of the eight sloops, hardly equals the Ranger in speed, although the contract required these vessels to go ten knots an hour. The Monongahela hardly reached the station before her boilers were found to need very extensive repairs. The only efficient ships on the station seem to be the double enders Monocacy and Ashuelot and the tug boat Palos. These vessels have performed more cruising within the last year than all the rest together. It is hoped the Richmond, after being almost rebuilt, will reach the station in a seaworthy condition; but with a botched screw, and boilers in the same condition as the Alaska's, she will probably be a "lame duck" all her cruise.'"

Leaves and their Functions.

A recent lecture at the Royal Institution, by Mr. W. T. Thiselton-Dyer, was devoted to leaves, well illustrated by remarkable plants. Leaves are an outgrowth of soft cellular tissue, originating near the growing point of the stem. The tissue arches over and forms the buds, from which leaves and flowers are developed, with much variety of structure, form, and position, and great diversity of function. The leaf consists of a delicate skin or epidermis (abounding in breathing pores, stomates), and layers of closely packed cells, filled with green chlorophyl granules (green protoplasm), with air spaces between them. The leaves afford a large surface to the influence of light and air. It is supposed that chlorophyl, under the influence of sunlight, separates the carbon from the carbonic acid in the air, gives back the oxygen, and, by combining with oxygen and hydrogen, the component parts of water, forms starch, from which sugar, oils, and fats are derived by chemical changes. The gaseous food of plants is taken in by the leaves; the liquid food, containing nitrogen (an important element in protoplasm) and many mineral substances, is absorbed by the roots. From these albuminoids and alkaloids are derived. Many plants are nourished by decaying animal and vegetable matters; some, such as the Nepenthes or pitcher plant, are provided with suitable digestive organs. When raw meat, for instance, is laid on the digesting surface, a fluid is secreted by which the food is dissolved and absorbed; and an increased number of seeds are produced by plants so nourished. By the hairs on the leaves of Venus' fly-trap the insect is caught, and afterward dissolved and assimilated. The transpiration of the water taken in by the roots is an important function of leaves. By this evaporation it is said that a sunflower gives off, through the stomates, a quart of water in twenty-four hours. The circulation is slow in the cells of the plant, but rapid along the walls of wood cells which have no protoplasm. The erect position of plants is attributed to the turgescence of the cells when filled with water; their drooping condition, to deficiency of the liquid. In conclusion, the lecturer alluded to the phenomena of the irritability of plants, as shown in the sensitive plant, Mimosa pudica; and to what is termed the sleep of plants—shown in two plants, brought under cover from Kew that day. One remained with its leaves closed, the other was awakened by being placed in sunlight. The cause is mysterious, but probably arises from the action of a stimulus creating movements in the molecules in the protoplasm of the cells.

A SCREECH-OWL took possession of a box at Lancaster, Pa., the other day, in which a pair of martins were building their nest, and when they returned would not let them enter. The birds soon flew away and returned with a whole army of companions, each bringing in his beak a piece of mud, with which they hermetically sealed the entrance of the box. When the box was opened a few days later, the owl was found to be dead.



UNSINKABLE STEAM VESSELS.