used in reference to iron-clads. The old warrior thought that the smoke and consequently the glory of naval engagements was materially diminished by impregnable sides.

The Board of Admiralty, in prospective, should be clothed with full power to reject or accept such inventions as are submitted to them, and their decision should be final—one from which there could be no appeal. To this feature our inventors would not object, provided the admiralty was composed of men who had a recognized position in their several callings, and it would save the country an endless amount of time and expense which might as well be avoided. The character of the board ought to be such that it could not be impeached on the ground of interest or collusion with other interested parties; and, as has been remarked by a writer in the daily press, "every member of the board should be held responsible for his own opinion," as he would undoubtedly be when elected to office. Should such a scheme be carried out, we feel certain that with the right men in it and with proper management, it could not fail to satisfy the popular demand. If, however, we are to have the same old routine that has hitherto been practiced in regard to weapons and inventions for national protection, we might as well be satisfied with our present condition. The frogs petitioned Jupiter for a king, and he gave them a log; but this they despised and derided, and asked for another. He then gave them a stork who immediately devoured the frogs without ceremony. Perhaps we might have reason hereafter to apply the fable to the Board of Admiralty and regret that we had not been contented to get along without its assistance.

In these days of political corruption when party hacks fill every nook and corner of official patronage, we shrink almost with horror at the bare mention of multiplying offices to be filled probably by a set of rascals acting on the principle of the doctors mentioned in "Hudibras," who said:—

> "If to cure all men is beyond our skill,
> 'Tis hard indeed if we can't *keep them ill*."

A NEW ILLUMINATOR---SMITH'S AIR LIGHT.

It is well known to all persons who have given any attention to the subject, that, if a more powerful light than the present ones used could be devised, equal in economy to them, its application to the arts and sciences would be highly desirable and beneficial. For railroad purposes, especially, its advantages would be manifest to all. To develope such an illuminator, Dr. George Hand Smith, of Rochester, instituted a number of experiments, and has at length been successful in producing one that, so far, seems to possess the most desirable features. His invention has been introduced upon the New York Central Railroad, and we have seen testimonials of a high character from the officials familiar with it. We saw one of them, a few nights since, on Broadway, and the light produced was of a most vivid and intense description. The inventor states that he has used it for photographic purposes, and that, by its virtues as a compound blowpipe, he has been able to deflagrate metals which fuse only at high temperatures. The inventor says:—

"This light belongs to that class of illuminators wherein a solid substance, such as a pencil of lime, is rendered incandescent, or intensely luminous, by the concentrated heat of ignited jets of combined gases. Of these lights the oxyhydrogen is the type, where, as its name imports, the gases thus employed are oxygen and hydrogen. The power of the oxyhydrogen light is well known, and repeated efforts have been made, in Europe as well as in this country, to employ it for practical purposes; but the great expense of supplying the gas, particularly the oxygen, together with the rapid deterioration of the lime, has defeated these attempts. The employment of lime for the purposes of illumination has lately attracted much attention abroad, from the extreme beauty of its light, but the difficulties just mentioned have prevented its introduction. It is here that my newly-discovered method applies, viz., the abundant supply of that greatest ingredient of artificial illumination—oxygen gas—literally without cost, by the employment of atmospheric air; carbureted hydrogen or common gas being substituted for hydrogen. Now, common air contains one part of oxygen and about three parts of nitrogen gas; hence it would require four parts of air to give the amount of oxygen required for illuminating purposes, *i.e.*, to obtain one part of oxygen four feet of air would be needed, as three feet would be nitrogen. Now, the great difficulty in using air for the purpose under discussion arises from the fact (and this fact alone has prevented its adoption) that four parts of air are combined with one of common gas, the gas is so greatly diluted as to prevent its burning readily, and what is still worse, if combustion was complete the nitrogen, not being combustible, would fly off unconsummed, and carry away the heat generated to such a degree as to render the luminosity of the cylinder of lime of no practical value. But if an amount of heat, from any source, is applied to the current of air previous to ignition, sufficient to supply the loss of heat from nitrogen, at the time of combustion, no heat is lost upon the lime, and the whole power of the oxygen is obtained as though no nitrogen was present. Also, the gas will be found to combine with a larger amount of hot air (and consequently oxygen) than with cold air. Hence, by supplying a current of pre-heated air to one of common gas ignited, an ample supply of oxygen is afforded, and all the heat generated is saved and concentrated upon the lime. This is the principal feature of my new method.

"The burner devised for railway lights is composed of four compound jets encircling a small cylinder of lime. A current of air and gas is conveyed to each jet, and, by a simple device, the stream of air is heated before it reaches the jet. The fourfold intensity of heat induces the dazzling whiteness of the lime peculiar to the oxyhydrogen light. When placed in the focus of a parabolic reflector, such as are in present use upon locomotive engines, it is increased to a ball of light 20 inches in diameter, or to the size of the mirror. The flow of air and gas is reliably and simply controlled by durable regulators and stop-cocks, within the lamp. Two gas-holders, placed under the engine, communicating with the lamp by a small pipe for each, carry twice or three times the requirements of a trip. These receive their charge at the engine-houses, before starting, from two stationary holders of larger dimensions, which are kept filled by a small pump driven by the local power employed at those places. To fill the holders on each locomotive occupies its engineer only from three to four minutes—very much less time than is required for filling and trimming an oil lamp.

"The great and remarkable feature of this discovery is, that a light of the most powerful character is produced almost entirely from air. The economy of this feature may be illustrated by stating that the Commissioners of the Central Park paid last winter, for the oxyhydrogen light, $1 60 per hour for each light; while the air light, of equal brilliancy, is produced for a trifle over *one cent* per hour!"

ABSORPTION OF GASES BY WATER AND THE LUNGS.

Set a pitcher of water in a room, and in a few hours it will have absorbed nearly all the respired and perspired gases in the room, the air of which will have become purer, but the water will be utterly filthy. The colder the water is, the greater its capacity to contain these gases. At ordinary temperatures, it will absorb a pint of carbonic acid gas, and a large quantity of ammonia. This capacity is nearly doubled by reducing the water to the temperature of ice. Hence water kept in the room for a while is always unfit for use. For the same reason the water in a pump stock should always be pumped out in the morning, before any is used. Impure water is more injurious than impure air.

The above paragraph we quote from an exchange; it contains some truth, but more error. It asserts that a pitcher of water placed in a room will absorb nearly all the perspired and respired gases in the room in a few hours, without any reference to the size of the pitcher or the number of persons in the room; although it adds with the semblance of precision, that "it will absorb a pint of carbonic acid gas and a large quantity of ammonia." Water has a wonderful power in the absorption of gases, but not to the extent set forth in the above extract. We will give the science of the subject. At the temperature of 60° Fah. water will absorb its own bulk of carbonic acid gas, nitrous oxide, and hydrosulphuric acid, but only 1.53 per cent of its bulk of hydrogen. River and lake water contains about 2¼ per cent of its bulk of air, but it is remarkable that this air contains 32 per cent of oxygen, while atmospheric air contains only 21 per cent of oxygen. As air is expelled from water by heat, the air in a warm room is much invigorated by the evaporation of water placed upon a heater or stove in it. At altitudes of 8,000 feet water does not contain one per cent of air, hence fishes cannot live in Alpine lakes, as the quantity of air in the water is not sufficient for their respiration. It is all nonsense to state that a pitcher of water placed in a room exercises the least noticeable effect in purifying the atmosphere by absorbing the gases expelled from the lungs of persons. The amount of air required for respiration per minute by a full grown man is one gallon, and two cubic feet of air per minute are rendered unfit for breathing by the carbonic acid gas expelled from his lungs. It would therefore require a pitcher containing 750 gallons of water to absorb the vitiated air of a room in which there was but one person, and the water would have to be renewed every hour!

Ammonia is neither perspired nor respired. Carbonic acid gas and the vapor of water are expelled from the lungs in the act of breathing. This is the gas which imparts the sparkle to wines and soda water. It is formed in the lungs by the oxygen of the inhaled air combining with the carbon in the blood. The phenomena of breathing involve remarkable mechanical and chemical problems. The air is not brought into direct contact with the blood in the lungs; it is spread over an extensive membraneous surface, and the carbon of the blood passes through this membrane and unites chemically with two equivalents of the oxygen, thus forming carbonic acid gas; such chemical action is slow combustion. When taken into the stomach, carbonic acid gas is rather exhilarating; it is only poisonous to the human system when inhaled by the lungs.

A CHANCE FOR THE INGENIOUS.

It appears from the report of the late attack by the iron-clad *Montauk* upon Fort McAllister, Ga., that when the steamer came within a mile and a half of the fortification, her further progress was stopped by a row of piles, firmly driven down and extending across the stream. The *Montauk* was not provided with any device for removing or cutting off the piles and so she had to remain there at anchor, and do the best she could in the way of shelling the fort. Little damage appears to have been done on either side. Now, had the *Montauk* been provided with a contrivance for blowing up or sawing off these piles, it is probable that her attack would have been attended with very different results. In addition to the capture of the fort and all its inmates, she could have captured the fine rebel steamship *Nashville*, which lay at anchor above the fort, in full view of the *Montauk* but out of reach of her guns.

The rebels rely upon piles as a means of preventing our iron-clads from navigating their rivers. We hope that some of our ingenious readers will instantly set to work and develop the mechanical apparatus necessary to render all such obstructions useless. It seems to us that at very little expense a portable machine could be produced, which, operated from on board ship, would soon cut out any desired opening through wooden piles.

International Agricultural Exhibition at Hamburg.

We have received from Mr. Robert Froëlich, agent, No. 49 Cedar street, this city, a circular containing information respecting the International Agricultural Exhibition, which is to be held in the city of Hamburg in the month of July next, commencing on the 14th and ending on the 20th. The animals and implements to be exhibited will be of the same diversified character as those which are usually displayed at our agricultural fairs. This will be the first exhibition of the kind held in Germany. The prize offered for the best steam plow is $700—second best $300.

Mr. Crittenden, of Kentucky, from the Committee on Foreign Affairs, has reported a joint resolution in Congress to facilitate a proper representation of the industrial interests of the United States at the above-named Exhibition. It appropriates $10,000 for the transportation of articles from all the States to this city (New York), thence to Hamburg and back, to be returned free of duty; and also $5,000 for the salaries of a commissioner and clerk.