Contributions to the Early History of Steam Navigation.

On the 9th of February, 1811, letters patent of the United States, No. 25, were granted to Robert Fulton of New York, for "constructing boats or vessels which are to be navigated by the power of steam engines." The State department at Washington has had occasion recently to make searches among its archives for records pertaining to the early patents, and among the curiosities thus brought to light is a letter from Robert Fulton, bearing date of New York, May 25, 1812, in which he requests Mr. Monroe, then Secretary of State, to give a positive order that his patents for steam boats should not be copied or examined except in case of disputes in law between him and other persons, of which, he says, there were none at the time; and intimates that the doing so enables speculators to contrive, not real improvements, but means of evasion, to the ruin of useful inventions.

Two letters of Henry Spencer have also been found, one bearing date of Albany, August 3, 1798, and the other of Albany, September 3, 1798, both accompanied by drawings and written descriptions of an invention, which he claims to have made, on boats made use of in inland lock navigation, and which may be applicable, he says, to the navigation of the great seas, and of a screw and other means of propulsion to such boats.

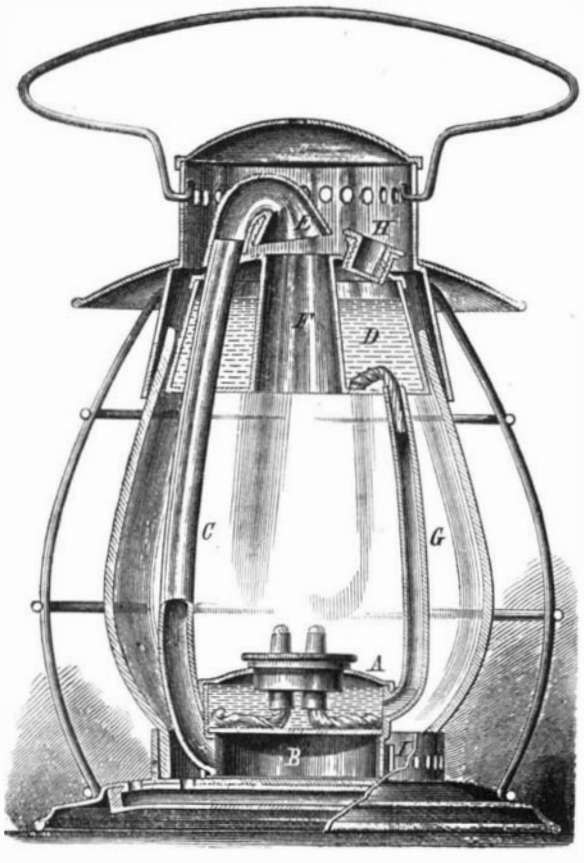
Measurement of the Chemical Action of Solar Light.

Dr. T. L. Phipson, F. C. S., in a note to the *Chemical News*, says: Many years ago I made some experiments on this subject in Paris, and described a method which I believe capable of giving more accurate results than any hitherto obtained. Having discovered that a colorless solution of molybdate of ammonia in sulphuric acid became greenish blue when exposed to the sun, and colorless again during the night, and that the amount of chemical action exerted to produce this tint may be accurately determined by a dilute solution of permanganate of potash, it suffices to operate always upon the same quantity of substance, and to expose it to the light for the same period of time, and in every respect in the same conditions, in order to possess a perfectly accurate process by means of which the problem of the chemical intensity of solar light may some day be solved in a completely satisfactory manner.

LORDON'S IMPROVED LANTERN.

The lantern herewith illustrated is constructed so that the heated air from the flame passed up through an oil reservoir, and thence is conducted down below the wick chamber, the object being to heat the oil in the latter, and thus afford a clearer and brighter light.

The wick chamber is represented at A, below which is another compartment, B, from which extends the tube, C upward inside the glass globe, through the oil reservoir, D and finally terminates in a funnel, E, over the pipe, F through which the hot air from the flame rises. Oil is supplied to the wick chamber by the tube, G, in the upper portion of which is a piece of wick which may be adjusted from the filling orifice, H, to allow the oil to flow to the wick chamber faster or slower, as may be desired. It will be observed that the tube, C, conducts the hot air down under the wick chamber, thus warming the oil in the latter. At the



base of the lantern is a series of holes connecting with the hollow space, I, for purposes of ventilation.

Patented through the Scientific American Patent Agency, July 14, 1874. For further particulars address Daniel Lordon, Fremont Center, Mich.

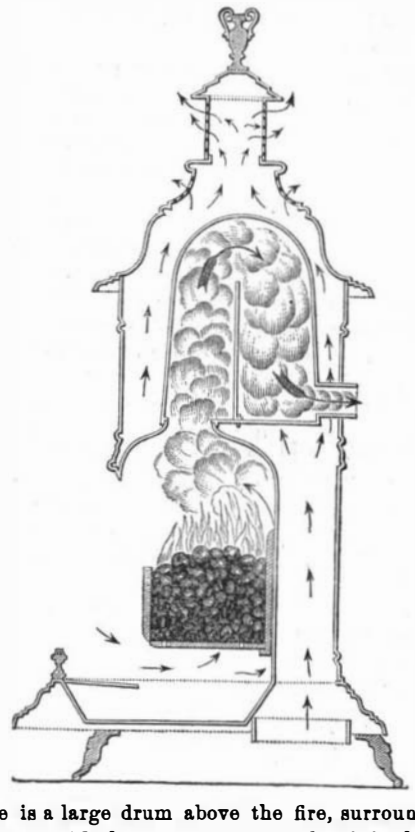
THE recent eruption of Mount Etna was predicted by Professor Silvestri, who has made a special study of such phenomena.

THE FIRE ON THE HEARTH.

While it has been and still is our general rule to decline the publication of engravings of stoves in our editorial columns, we believe it to be to the interest of our readers that our regulation in the present instance should be suspended. We make this exception on account of both the

novelty and the unquestionable merit of the heating apparatus to which the above appropriate name has been given. As regards the mechanical construction of the stove, little need be said, since it is plainly represented in the sectional view, Fig. 2, while the exterior appearance is shown in Fig.

Fig. 2.



1. There is a large drum above the fire, surrounded by a jacket so arranged that a constant supply of fresh air may be continuously brought into contact with greatly expanded surfaces, which absorb the maximum quantity of heat, and impart it rapidly to the inflowing currents, thus preventing overheating, and at the same time supplying the room with an abundant, genial, and invigorating atmosphere. It will be observed from the sectional engraving that two distinct currents pass through the stove. One enters beneath the grate, ascends to the chamber above, passes over the diaphragm therein, and thence goes to the chimney, furnishing the draft. The other enters under the stove, and becomes heated by contact with the hot surfaces; and rises through the jacket, thus compelling a constant circulation through the latter. The fire is entirely open, so that a large supply of additional heat is radiated therefrom. The construction, evidently, is such that there is no opportunity for leakage of the deadly carbonic acid; nor is there any contact of highly heated plates with the air of the room to generate carbonic oxide. Purity of the air—which is the most important requirement—being thus insured, the maintenance of proper circulation is provided for, as already described, so that the stove becomes an efficient ventilator, constantly changing the atmosphere, while distributing at the same time, throughout all parts of the apartment, a moderately warmed, fresh current. In this last respect its advantage over the ordinary open grate in the mantel will be obvious, not only in point of better utilization of the fuel and consequent economy in the same, but in the fact that the old objection to grates, of "roasting the face while the back is freezing," is effectually done away with.

In addition to the advantages which we have enumerated are those of simplicity, there being no intricate flues to become clogged and foul, no dampers to get out of order, and no grate set far into the interior, to dump or clean which is a constant aggravation. The latter is easily shaken, and clinkers readily removed.

It will not require the complimentary testimonials, which the manufacturers submit, from Mr. Lewis W. Leeds (than whom no engineer has more carefully studied the subject of ventilation and warming) and other excellent authorities to demonstrate the value of the invention. It will be a veritable blessing in schools, churches, factories, and all similar apartments where large numbers of people are confined, for lengthy periods of time, for study or work.

Patented by Mr. W. L. Phillips, July 13, 1874. For further particulars, address the Open Stove Ventilating Company, 107 Fulton street, New York city.

Detection of Fuchsin Adulterations.

It has become quite common for French wine merchants and confectioners to use fuchsin to highten the color of their wares. The poisonous properties of this substance have been repeatedly demonstrated, so that, in addition to its being a mere adulteration, its consumption in other substances is directly detrimental to health.

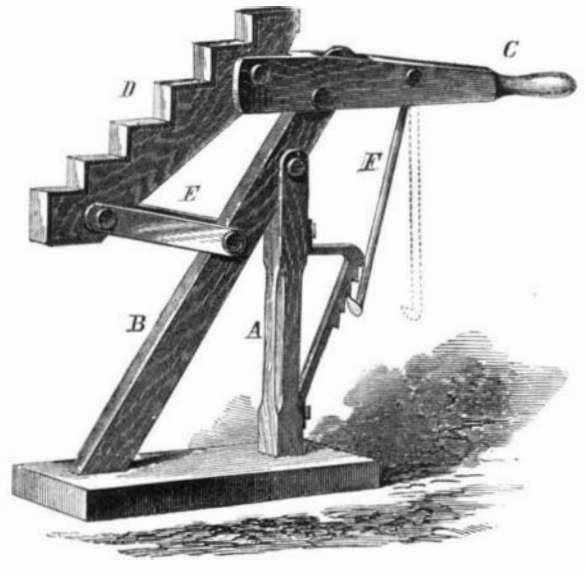
The presence of the substance can be readily recognized in the following manner: Place about 1½ ounces of the suspected compound in a vial, and treat first with 150 grains of subacetate of lead, and then with 300 grains of amylic alcohol. If, after agitating the mixture, the alcohol which separates appears colorless, no fuchsin is present; if the alcohol is colored red, the reverse is the case.

ROWLAND'S WAGON JACK.

The annexed engraving represents a simple and inexpensive form of wagon or lifting jack, which is applicable to all kinds of vehicles.

The upright standard, A, supports an inclined bar, B, both being secured to a substantial base piece. To the upper extremity of the bar, B, is pivoted the lever, C, the forward end of which is similarly attached to the notched bar, D. The lower portion of the latter connects with the bar by means of the pivoted connecting bars, E. To the lever, C, is pivoted the rod, F, the lower end of which is hook-shaped, to engage in the teeth of the bent ratchet bar, shown attached to the rear side of the standard, A.

In using the jack, the free end of the lever, C, is raised and the machine is moved forward until the axle of the wagon rests in one of the notches of bar, D. The lever is then carried down until the load is raised to the desired hight. The hook, F, is next swung forward from the position indicated by the dotted lines in the engraving, and caused to engage upon one of the teeth of the ratchet bar, thus holding the load



suspended. By slightly pressing down the lever, C, the hook readily drops away from the ratchet, thus lowering the axle or other object supported.

Patented through the Scientific American Patent Agency, June 16, 1874. For further particulars regarding purchase of State and county rights, address (during next two months the inventor, Mr. James S. Rowland, Cambridge, Ohio.