and vapors, and the most valuable of these are the hydrocarbons. Among the substances considered as impurities are carbonic acid, carbonic oxyd, sulphide of hydrogen and ammonia; and of these, the most troublesome to remove is the sulphide of hydrogen. Carbonic acid and ammonia are readily washed out with water, but the sulphur compounds require lime. It is sometimes supposed that gas is destructive to books and pictures, and that it should not be used in reading rooms. But this is an unreasonable prejudice; the products of combustion of good gas are only carbonic acid and water.

The President—Has private gas-making been found practicable?

Professor Hedrick—Yes, but many families have found it too troublesome to make gas every day, and the apparatus is liable to get out of order by neglect and disuse.

Mr. John Johnson here made a grand display of burners in actual use, being set on a "float of lights" extending the whole width of the room. The whole number of burners exhibited was fifty; a large majority of these was of the stuffed or checked variety. A burner revolving on the Barker-mill or turbine principle was in rapid motion the whole evening. The Johnson and Stevens burner, of adjustable orifice, attracted a great deal of attention, being capable of yielding the smallest flame as well as a flame nearly a foot wide. But the most curious was a straight, thin and elastic tube, about three feet high. When this tube was upright and still, the gas burned like a candle flame; but when the tube was swung back and forward like a pendulum, the flame was white and brilliant only at the instant of rest at the extremities of the vibrations. In the dark, a bluish streak is seen, and alternating at the ends, a brilliant star. By swinging the tube in a circle or ellipse, interposing screens, &c., a great variety of curious effects are produced. Mr. Johnson described the peculiarities of the various burners, illustrating his remarks by experiments, and concluding with a condemnation of stuffed burners as a class.

The President—The main points to which we seem to have arrived in this discussion are:—1st. The yellowish flame is the most economical, and is yielded by gas burning at a low pressure from wide orifices. 2d. A large flame gives more light than when the same amount of gas is burned from two or more small ones. 3d. The great desideratum is a burner which will regulate the flow of gas automatically. Our New York gas is of excellent quality, and does not suffer in comparison with gas of other cities. It is better than the gas of London.

Mr. Seely presented some tables of experiments made to determine the regulating power of the Thompson burner. The comparison with the most approved of the ordinary burners showed that the Thompson burner performs well and regulates, with certainty and reasonable accuracy, within ordinary limits of pressure. At the present time this is the only true regulating burner before the public, and will come into use unless a better one can be devised.

Mr. Fisher—Why not have reflectors over our street lamps, so that one-third of our light shall not be wasted on the sky?

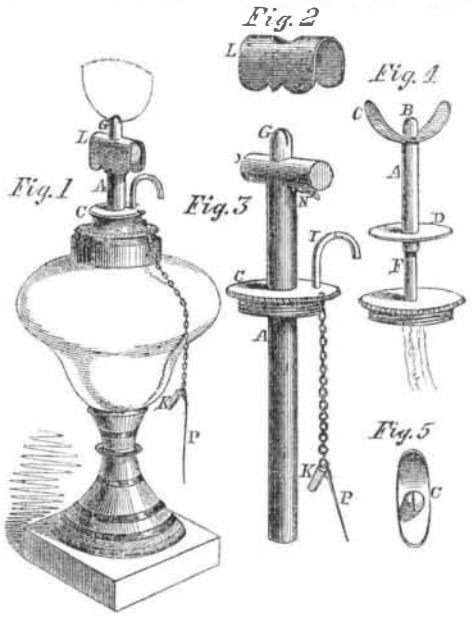
Subject for the next meeting: "The Theory and Value of Cut-offs."

GAS BURNER LAMPS.

The generation of vapor from a volatile hydro-carbon fluid in a lamp, and the burning of it in jets has been long practiced. In such lamps the fluid is drawn up to a heated surface by capillary attraction; and being converted into vapor by the heated metal, it issues through small orifices under a button and is burned like common gas. Such lamps are really Lilliputian portable gas-works, and are very cleanly and convenient. The accompanying engravings represent improvements on this class of lamps, for which two patents were granted on April 3, 1860. Fig. 1 is a perspective view of a lamp, Fig. 2 is a view of the vacuum chamber cap; and Fig. 3 is a view of the wick and fountain tubes, with the heating chamber. These illustrate the invention imbraced in one patent. Fig. 4 is a view of the wick tube and slide; and Fig. 5 represents a curved vaporizing plate embraced in the other patent. We will describe the two separately, so as to convey clear ideas of their nature and construction.

First: The lamp, Fig. 1, has a conducting tube, A, which passes down through the screw cap plate, C, to within three-fourths of an inch of its bottom, and its lower end is always beneath the surface of the fluid. D, is a hollow chamber screwed on the upper end of this tube near the orifice. There is a jet hole, N, on each side of the tube, A, immediately under the chamber, D. The burner-tip, G, is screwed or otherwise connected to this chamber. I is a curved air tube which passes through the plate, C, and communicates with the atmosphere and the interior of the lamp. L, is a cover for the hollow chamber, D.

When the chamber, D, is exposed to heat from a flame, a partial vacuum is created inside by rarification and escape of heated vapor. The air outside of the lamp then passes through the tube, I, and presses on the surface of the fluid in the lamp, forcing it up the conducting tube, A, in quantity commensurate with the heat or rarification at the chamber, D. It is therefore a fountain pressure lamp, and is different from one that is merely governed by capillary attraction. If the heat is too great at the chamber, D, one of the jets, N, may be stopped by the tapered plug, P, and when the lamp is not in use, the air tube, I, is closed by the plug, K. The tube, A, may be stuffed with wick in the usual manner. The fluid is generated into gas by the great heat maintained at the vacuum chamber, D, by the jets under it. The cover, L, protects the heating chamber



from currents of air so as to maintain a steady and uniform action, and we have been assured that a most steady and brilliant gas light is thus secured. The flame is thus raised above the top, without being depressed and drilled with a button as in the common vapor burners.

Second: In the ordinary fluid lamp a wick is inserted in the tube, F, in the usual manner. A slide, A, is provided to pass over tube, F, like a sleeve, and to this is secured the curved metal plate, C, the tip or burner, B, and circular plate, D. Allowing the lamp to be filled with fluid, and the flame of alcohol from a piece of wire-gauze or the flame of another lamp is held under the curved plate, C, the fluid in tube, F, minutely distributed in the wick, will be converted into gas by the heat, and it will ignite at the tip or burner, B. The flame of the burner will issue through the slit and follow the inner surface of the curved plate, C, up to its end, and by thus intensely heating this plate, the vapor is converted into pure gas, and a brilliant light obtained. The slide, A, may be raised by the plate, D, to diminish the volume of light as may be desired.

Perfect combustion is not effected in lamps unless the vapor of the fluid is converted into pure gas. In common vapor burners where the heat is not sufficiently intense below the outlet of the tube, some of the fluid is drawn up in the condition of mixed vapor and escapes without undergoing perfect combustion because it cannot be supplied with sufficient air. A loss of burning material is thus sustained in connection with a more feeble light. The high heat to which the vapor is exposed in the above lamps converts it into pure gas, thus saving material and giving a very bright light. The small burner may be lighted with a common match owing to the great heating surface of plate, C. These improvements have been applied to all forms of lamps, from the parlor chandelier to the common hand lamp.

More information may be obtained respecting them by letter addressed to Messrs. Hopkins and Anderson, patentees, at Easton, Md.

A COLUMN OF VARIETIES.

Gold is usually found in a solid metallic condition, when not distributed through quartz. At Sonora, Cal., however, some beautiful specimens of crystallized gold have been found; they are very rare productions.

At a late meeting of the Society of Natural History, held in the Medical College, this city, Mr. Morris presented specimens of boiler iron, crystallized by the action of fire, being portions of the boiler lately used in the Deaf and Dumb Institution. When placed in the building, the boiler was perfect, and of the best iron, but, by continual action of the heat, had become very brittle, so that a very slight blow would fracture it.

One of the most accomplished entomologists in this country is Mrs. Charlotte Taylor, of Savannah, Ga. She has contributed illustrated articles to *Harper's Magazine*, on the insects of the cotton plant, which are held to be the most learned ever published on the subject.

The French government have applied to the Academy of Medicine, at Paris, to ascertain the best means that can be adopted to put an end to the baneful effects of phosphorus on the men engaged in making lucifer matches. The Academy recommends that they should be made of pure amorphous phosphorus, or without phosphorus at all.

Sir J. F. Herschell, in a communication to the London *Photographic News*, directs the attention of photographers to the desirableness of discovering the art of taking photographic pictures with their natural colors. He says:—"I fully believe the problem will, one day, be solved; already we have a certain approach to it. I possess photographs in which the green of the foliage is unmistakably distinguished. In particular, a photograph of my residence, in which certain magnolias, trained against the brick building, and some other shrubs, have a fullness and decision of color which render it difficult to imagine that they have not been gone over with a brush, while the use of a magnifier shows that most certainly such has not been the case."

In the region of Oil Creek, Pa., the atmosphere is so saturated with oily vapor that, when an electric cloud comes over the oil springs, it is at once robbed of its noisy character, and descends quietly to those lubricating fountains in the shape of genuine "greased lightning."

A correspondent (Abraham Hardy) of the *Irish Agricultural Review* writes, in glowing terms, of dandelion salad, plain bread and pure water. He asserts that nothing can be better than these for the promotion of mental and bodily health. He expresses an experimental opinion, not a hypothetical sentiment, and he revels on dandelion salad as an ox on fresh clover. There is no accounting for tastes.

Kamptulicon is a substance manufactured from ground cork and india-rubber, and is extensively used in England for many purposes; it is proposed as a lining for the iron-plated war ships. An 8-inch shot fired through a block of this substance, one foot in thickness, did not make a single splinter, and the kamptulicon immediately closed upon the opening, so that no water could pass through.

A varnish made with one pound of sulphur boiled for half an hour in an iron vessel is a perfect protection from damp to brick walls. It should be applied with a brush, while warm.

To enamel iron articles, clean the surface; put on a composition of ground feldspar, quartz and borax; then fuse in a furnace. Black copal varnish may answer as a coating for cast-iron articles that are exposed to water. This varnish must be made with linseed oil and asphaltum.

Water-proof paper may be made as follows:—Take 2 ounces of alum and 1¼ ounce of white soap, and dissolve them separately in a pint of hot water for each. In another vessel, containing a pint of water, dissolve 1¾ ounce of glue and 1½ ounce of gum arabic; then mix the two solutions, heated over a fire. The paper is passed through this bath, then squeezed between rollers and dried. Or, the paper may be dipped in the solution, in sheets, then hung up to dry in the air.

The production of iron in Great Britain, in 1859, amounted to 5,600,000 tuns. In 1740, the whole product of iron was but 17,000 tuns. Cort's inventions of the puddling furnace and drawing rolls, with the use of Neilson's hot-blast have revolutionized the making of iron.