

the lapse of a day was born a young one, which possessed in its uterus an ovum already in segmentation. From this ovum two days later was produced a third female, while a second ovum in the uterus of the mother was also already commencing to segment. Whether *all* the "summer" (parthenogenetic) eggs develop into females or not, has yet to be proved. Here also it was shown that one polar body was extruded.

The second part of the memoir sums up the literature relating to the subject, with the result that the extrusion of two primary polar bodies from fertilized ova has been demonstrated in sixty-six cases, that of one only from parthenogenetic ova in fourteen cases; while none of the few observers who describe the extrusion of one polar body only from a fertilized ovum, have endeavoured to show that a second one may not have been present, at an ontogenetic period other than that which they describe.

G. HERBERT FOWLER.

SIEMENS'S GAS-BURNERS.

OWING to the very high temperature of ignition of gas, the only way in which it can be successfully used with the greatest economy is by the application

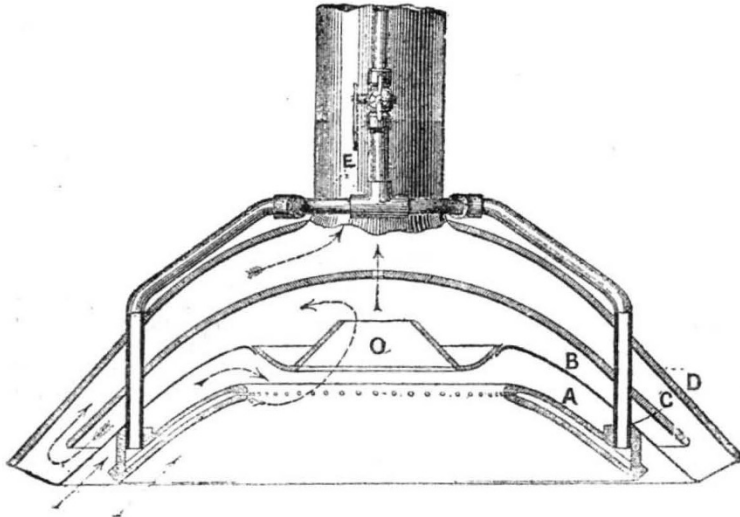


FIG. 1.

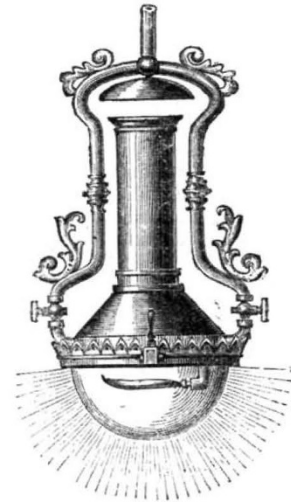


FIG. 2.

of the light and its intensity were in vain dwelt upon: the British public were not inclined to entertain the new lamps, and a comparatively small business was done in them. Besides this, it was discovered by degrees that when impure gas was employed the gas passages became blocked with a sulphurous deposit, so that, in order to maintain their high efficiency when in constant use, these passages had from time to time to be cleared. Mr. Siemens set to work to overcome both these defects, and the lamps he has now produced lend themselves to artistic ornamentation, and have no passages to offer obstructions to gas of ordinary quality.

The lamp we propose to describe in the first instance is the one known as the open-flame sunlight pattern. It is designed for use in positions where the ordinary sunlight lamp is employed, such as public halls, concert, dining, and billiard rooms, banks, and theatres. The flame in this lamp is extremely delicate and elegant in appearance, having the form of an inverted cone of light, apparently unsupported. The annexed drawing illustrates the construction of this lamp. Four hoods made of suitable material are arranged one above the other so as to form passages through which the products of combustion

of regenerators. This was proved practically by the late Sir William Siemens in carrying out his own and his brother's invention of the regenerative gas-furnace. For more than eight years now Mr. Frederick Siemens has devoted a portion of his attention to the domestic applications of gas, and he has quite recently opened a depot in the Horseferry Road for the sale of his gas-lamps. Here, on Tuesday afternoon, he entertained several gentlemen interested in gas illumination, and tested photometrically some of the burners we propose to describe and illustrate.

It is well known that the light intensity of a flame increases with its temperature in a higher ratio than the arithmetical, although the actual ratio has not been absolutely determined. It is, moreover, known that the more the energy of flame is transformed into radiant light and heat the less is the amount carried away in the products of combustion. But the difficulty is to take advantage of these laws in practice, and to combine high temperature with durability, and the use of regenerators with simplicity of arrangement and elegance of appearance in the lamp.

After the Smoke Abatement Exhibition, at which Mr. Frederick Siemens's regenerative gas-lamps were for the first time exhibited in this country, a great outcry was raised on account of their unsightliness. The economy

are removed, their waste heat being utilized to heat the air supplied to the flame. The jets of flame issue in a ring from the lowest hood; the products of combustion, passing through the aperture O, are drawn downwards through the annular space B, and then upwards through C to the chimney E. The hood between the passages A and B is intensely heated by the products of combustion descending on its upper surface; and the air which travels through the annular space A, on its way to supply the gas-jets, takes up the heat from the hood, the flame being thus supplied with heated air, as well as burning in an intensely hot atmosphere. The lamp we were shown consumes 24 cubic feet of gas per hour, and gives, with ordinary London gas, a light equal to 180 sperm candles, or 7.5 candles per cubic foot of gas, which is more than twice the light obtainable from the same amount of gas burnt in ordinary burners. This lamp was set up with a ventilator, but was much too brilliant for use in the room in which it was exhibited, the ceiling being only about 12 feet above the floor, whereas it should be placed at an elevation of 30 feet or more, when it would not only serve for illuminating-purposes, but also for those of heating.

The Siemens regenerative flat-flame burner, as will be noticed from the accompanying illustration, is a lamp of a quite different character from the one just described, burning as it does within an inclosing glass, the previous lamp being quite open to the air. The lamps exhibited consumed from 7 to 8 feet of gas each per hour, and are of various ornamental forms. It consists simply of an ordinary bat's-wing burner supplied with hot air through perforated plates, which are heated by the waste heat from the products of combustion, and by radiant heat communicated to the perforated plates. The advantages of this form of lamp are those of construction, application, and economy. The principal parts of the regenerator consist of simple castings, whilst the only wearing part is the tip or burner, which is, as already stated, of the ordinary kind, and may be easily replaced at trifling cost. It can be fitted to the ceiling of a room like any other gas-lamp, or may be connected up to a chimney, so that the products of combustion may be withdrawn from the apartment. There is a provision for lighting this lamp without removing the glass globe, the glass being sufficiently far removed from the flame not to receive any

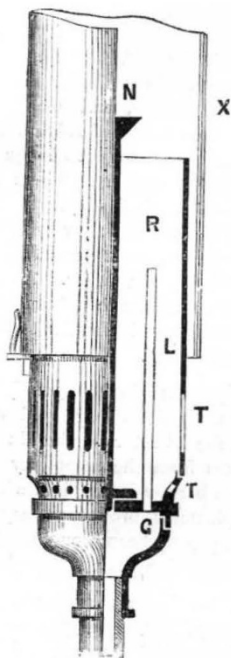


FIG. 3.

deposit upon its surface. With a consumption of 7·2 cubic feet of gas per hour, this lamp has been found to give without reflector a light equal to 72 sperm candles, or 10 candles per cubic foot, being more than three times the light produced by ordinary gas-burners, whilst if three flames are inclosed in the same lamp the efficiency obtained is still higher.

A third form of burner is Siemens's improved argand. This is not a regenerative gas-burner properly so called, and hence the economy is not so great as in either of the burners previously described. Instead of utilizing the waste heat of the products of combustion, in this burner the heat of the lower or non-luminous portion of the flame is applied for the purpose of heating up the air which is supplied to the burner. The sketch shows the arrangement in half-section. It consists of gas chamber, G, and tubes, R, from which the gas issues and is burnt; a metal stem, N, rises a certain height above the top of the gas-tubes, serving the double purpose of improving the form of the flame and conducting a certain amount of

heat down to assist in heating the air supplied to the burner. The air enters through the slots T, in the lower portion of the cylindrical case L, which surrounds it, a hot chamber being thus formed, from which the heated air passes to the flame. A glass chimney, X, incloses the flame as in the ordinary argand burner.

By means of this lamp an intense white light is produced with some economy of gas, the light produced with 6 cubic feet of gas being 26 candles, or 4·33 candles per cubic foot per hour, as compared with 3·2 in the ordinary form of argand burner. When an opal glass shade or reflector is used, throwing down a portion of the light, this burner gives a light of 6·33 candles per cubic foot. Its applications are various, but it is mainly applied for reading and desk purposes.

Mr. Siemens, in reply to a vote of thanks, said that the only economical way of burning gas was with the application of regenerators. This had already been proved by both the late Sir William Siemens and Mr. Frederick Siemens as regards furnaces for industrial purposes, and it is now being exemplified by Mr. Frederick Siemens in the domestic applications of gas.

NOTES.

THE University of Cambridge has sustained a severe loss by the death of Mr. Coutts Trotter. He died on Sunday morning last. Next week we shall give some account of his services to his University and to science.

THE United States Chief Signal Office has suppressed both its mountain stations, Pike's Peak and Mount Washington. The latter was suppressed at Michaelmas. The grounds alleged are—the reduction of the grant by Congress, which has been very serious, and, further, inability to use the reports in forecasting.

THE Chief Signal Officer (Washington) has issued a circular, dated November 10 last, stating that, in view of the large number of letters he has received deprecating the discontinuance on January 1, 1888, of the International Meteorological Observations (see NATURE, vol. xxxvi. p. 545), he has decided to continue to receive such observations, made at noon, Greenwich time, after that date. He does not promise to publish them as regularly as heretofore, but he will do what he can to give observers some return for their labours in the interests of the science of meteorology.

THE *Annalen der Hydrographie und Maritimen Meteorologie* for November contains the first part of the explanatory text of the daily synoptic charts of the North Atlantic Ocean for the winter quarter of 1883-84, together with charts showing the positions of the principal barometric maxima and maxima (see NATURE, vol. xxxvi. p. 159). The depressions of January 22-31 are of especial interest, as they include the lowest barometrical reading ever recorded in Europe, viz. 27·332 inches at Ochertyre, near Crieff, N.B., on January 26, 1884. The readings nearest to this are 27·33 inches, about 6° further south in the Atlantic, on February 5, 1870, and even 27·245 inches in Iceland on February 4, 1824. A still lower reading has lately been quoted for False Point (NATURE, November 17, p. 68). The storm of January 26-27 was also remarkable for the rapid fall before, and the rapid rise after, the minimum pressure.

THE Monthly Weather Charts of the Bay of Bengal and adjacent sea north of the equator, recently published by the Meteorological Department of India, very clearly illustrate the distribution of pressure, wind, and currents, as well as the changes of the monsoons, in those parts. The charts have been prepared from data for the years 1855-78, and supplied by the Meteorological Council, at the expense of the Indian Office. Each chart is accompanied by explanatory text.