In the original engraving we illustrate a retort and furnace now extensively used in Wales in the extraction of oil from shale, and in some parts of the United Kingdom in the manufacture of paraffin from coal. It has been designed by Mr. Griffiths, the inventor of the popular form of the proper process, and has proved so successful that about 300 retorts are now in actual use. The apparatus is so simple that little explanation is required to make its construction and mode of action perfectly clear. It consists of a cylindrical outer iron retort used in inclosing, and built within an inner one in such a way that the gas is completely surrounded on its way to the chimney. In making real oil it is necessary that the heat supplied should be moderate yet sufficient. The oil is first driven into the space between the two retorts, and is then conveyed into the iron sanding cooling-box, but if the gas is too strongly charged a change must take place, the amount being always regulated by the temperature of the sanding. The change takes place, therefore, a considerable proportion escapes the permanent condensing atmosphere; secondly, that an abandonment of one of the meniscus of the iron network was sufficient to cause an explosion where fire-damp existed in any quantity; thirdly, that when the lamp was exposed to draught, or moved rapidly, the flame might pass through the spaces and communicate with the explosive gas; fourthly, that a drop of oil, or a mixture of oil and mixed distnshing, adhering to the outside of the lamp, might become heated and ignited in the midst of fire-damp; and, lastly (and this, perhaps, is the greatest objection to the Davy lamp), that the air, which is at times good, becomes almost extremely observed, after being some hours in the ret, from the manner being choked with coal-dust. M. Mousselle's invention, through constructed on the principle of the Hoarwood's Davy's lamp, is said to be far from its disadvantages that it is perfectly dark, even when fire-damp did not exist. Notwithstanding this fault, the Mousselle lamp, an account of its superior safety qualities, is now generally used in the Belgian collieries, and is made in almost every part of France.

The accompanying cuts will render its construction easily intelligible. The wick holder and the lamp for securing the wick are generally arranged in the same way as with the Davy lamp, but a thick cylinder of glass takes up about two-thirds of its entire height. A common tube serves as a chimney to connect outside the products of combustion, and it passes through a diaphragm of wire gauze to which it is fixed. The cylinder of wire gauze is furnished at the top with a cap of copper-plate, and below with a short cylinder of the same material, which last is made with a horizontal ring, by means of which it can be fixed to the glass cylinder. The air required for the combustion passes gradually through the cylinder and the wick gauze. The diaphragm, until it reaches the interior space between the chimney and the glass cylinder, coming in contact with the wick, the combustion takes place over the surface of the lamp, and streams through the chimney and the holes of the top, and also through the porous meshes of the wire cylinder.

The framework of the lamp is made at the bottom of eight vertical rods, which protect the glass cylinder; the wire gauze cylinder is protected with only four rods, which are somewhat inclined to the axis of the lamp. All the rods are riveted together to a ring, so that the screwing down the upper framework into the oil holder keeps the whole together, and all the joints tight.

Mousselle lamps weigh about two pounds, which is very much more than the weight of the Davy. But the ratio of illuminating power is said to be at 2.4. By protecting the face of the glass cylinder nevertheless actually affects a swing in the oil burnt, specially when the lamp is carried in a current of air. The saving of oil is said to be from one to two per cent. as compared with the Davy. An objection is the shadow thrown down by the lamp in the middle, as also the circumstance that, as the chimney must be kept very near the wick in order to separate the ascending heated current from the descending air which is to be burnt, the zone of light is given in narrow strips of construction affords it the great security of the Staphanum, or "Gourdine" lamp, as, when placed in fire-damp, the flame lightens out, and at once gets extinguished. As the air required for combustion comes from above, should the fire-damp which may get into the case get inflamed, the products of combustion have not time to escape up the chimney; they partly remain in the cylinder and exit with the fire-damp coming from the outside, so that the flame gets every moment less and less air to feed it. In the meantime the carbonic acid gas collects itself at the bottom of the cylinder, and put out the flame or cause it gets high enough. As observed by Mr. Egerton, this lamp is unfortunately liable to be extinguished when set in a shutting position. It is also subject to get extinguished in any current of air, especially when the oil is coming down the pit. It is not, as a rule, the oil which is the lamp properly to be extinguished; its oil, the candle, makes it safer, and, though all, its superior light must greatly add to the personal safety of the miner. The majority of the accidents caused are from falls of the pit wall; and it must be evinced that this danger is answered when the wick is working in a dina and uncertain light.

A GENERAL TELEGRAPH OFFICE. — It is stated that measurers will shortly be taken at places all the electric telegraph lines in the country in the hands of the government, being now in a state of suspension, as is done in Switzerland and other places.