

fuse, and timbering, would cut in the same time about 12 feet. The immediate uses to which this machine can be put to work are innumerable. Subways that formerly took five years to construct can now be run for half the expense in one-tenth the time. Water in unlimited quantities can be brought through the mountain walls, and the vast arid areas of the deserts will be made to blossom as a wonderful garden.

A NEW ILLUMINANT.

A new system of illumination based on the same principle as that generally used in railway car lighting has been recently introduced in Germany under the name of 'blau (blue) gas.' The gas is delivered in liquid form, in such shape that it may be used in closed rooms in hanging burners giving from 50 to 1,000 candle power. To use the gas, all that is necessary is to pour the liquid from the steel cylinders, in which it is delivered, into the gasometer. This is almost as convenient as having ones own gas plant, for one can protect himself against accidents at the factory or delays in transit by always having on hand several filled cylinders. A cylinder contains 22 pounds of the gas, and costs about \$2.86. This quantity will supply a 50 candle power burner for 480 hours, so that this illuminant appears to be cheaper than petroleum. This 'blue gas' can, of course, be used for heating and cooking as well as for forging, hardening, and tempering, and other industrial processes. It is a hydro-carbon compound, free from carbon-monoxide, and is not poisonous; its heating effect is 3½ times that of ordinary coal gas. The gas is burned at a pressure of about 1 inch of mercury, or 13.6 inches of water at the burner. Almost any apparatus that is arranged to burn ordinary coal gas or acetylene gas can be altered without much difficulty to burn this; and in such cases all that is necessary is to make the connection between the cylinder and the house pipes through a reducing valve. As regards its explosibility, Prof. Gotz, of Augsburg, reports that, while the range of explosibility of acetylene gas when mixed with air is between 2 and 49 per cent. (a range of 47 per cent.), and that of ordinary coal gas is between 6½ and 19½ per cent. (a range of 13 per cent.), that of 'blue gas' is only between 4 and 8 per cent. (a range of 4 per cent.) No special permission from the authorities or the insurance companies is necessary for its use.

Officials of the U. M. W. in the anthracite region have a hard time of it in keeping alive the interest of the members. This they must do or there will be short efforts to the formulation of a plan for keeping their in the union. Following the settlement of three years ago the membership, which at that time numbered 90,000 declined rapidly until last fall there were only some 30,000 men in the three districts who had their dues paid up and were in good standing. At present there are about 75,000 enrolled, according to official figures, and having failed to get the check-off written into the recent agreement, the leaders are trying to devise some other effective method for avoiding a depletion of the ranks such as has marked periods of tranquility in the past. The present season would prove one of widespread prosperity.

COAL MINERS AND THEIR WAGES

Coal miners use many strange methods for determining the amount of their earnings. In one colliery for instance, the hewer will 'rax' his cutting, the word 'rax' meaning to extend one's arms and body to their fullest extent, as a man does when he stretches himself on first awakening from his sleep. What, therefore, the collier does, is to stick out his arms horizontally to their fullest extent along one side of the seam of coal he is cutting, the length so measured off, and known as a 'bit' counting for so much cash on paying out day. The Staffordshire miner bases his wages on what is known as a 'stint,' which is the name given to a fixed minimum quantity of work performed in a variable period of time known as a 'holer's day.' Thus supposing in a certain colliery a holer's day's work is thirty-five cubic feet of coal hewn, then as soon as he has finished getting this amount he is working overtime, so that his actual day's pay may exceed by 50 or 70 per cent the nominal amount of his wage. Amongst the Scottish miners, again, the minimum day's output of a hewer is termed a 'darg' and all he hews extra is paid for at extra rates.—Advertiser.

The new screening and picking plant at Sydney No. 5 is one of the most compact and serviceable possible. The building containing the picking tables is not large, but it is sufficient for every practical purpose. There are two picking tables. When screened coal is being made one of the tables is employed for round coal and the other for house coal which is coal free from all dust and of about egg size. The coal coming from all dust large and very free from stone. At most tables the coal is delivered into the waggon at the side; here they are loaded lengthways and it is an improvement. The apertures at the end of the tables are long, and are lowered when the empty wagon is run in—this to prevent breaking the mouth of the egg or house coal table there is a 'stopper' which prevents the coal rushing too quickly on to the table. Ten feet more or less from the stopper is a 'turner'. This consists of three iron plates in line, V shaped plates to a plate. The coal before coming to these plates has been picked, and the object of the turners is to turn over the coals so that any pieces of stone that may have been overlooked may be exposed after the coal has been turned over. Without exaggeration No. 5 is a snug little colliery, taken all in all, of which the management may well be proud, even though it be bare of modern film films.

In the year 1650, at a colliery in North Wales, the general plan was to employ a man to enter the mine and fire the gas before the miners went to work. This man, who was called a 'fireman,' was dressed heavily, with his outer clothes thoroughly soaked in water. He carried a cane on which a naked lamp was fixed; when a doubtful or dangerous place in the mine was reached, he would lay down on the floor, or in a ditch, and then raise his candle to the roof and fire the gas. The historian states further that the fireman was seldom hurt. If the plan followed in 1650 were to be adopted at some of our gaseous mines today, it is probable there would be a great scarcity of firemen.