children under 16 years of age, either male or female, are limited to 10 ; for those between 16 and 18 years, 11 hours a day is the limit, or 60 hours a week. These working hours are to be divided by one or more periods of rest, aggregating at least one hour during the day, and one rest day each week is secured to all young people under 18, as well as to all women workers. Penalties ranging from 5 to 15 francs are laid down for each infraction of this law and for each worker affected. There are also numerous special regulations affecting female and child labor in various industries, which are calculated to improve the condition of those coming under the influence of the new law.

In no part of the world has the struggle between organized labor and organized capital been more severe during the past five years than in Australia, and the one cause of quarrel throughout was the demand on the part of the strikers for the exclusive recognition of unionism. Had the unionists won the day, every worker in Australia would have been compelled to join a union and place himself under the domination of the small cliques of individuals in the big cities who make of labor agitation an exhilarating and lucrative profession. The boycott was used alike against employers and non-unionists. "We intend," said the Shearers' Union in a manifesto, "to teach the squatter the folly of resistance. He shall not be allowed to shear his wool except by union labor. But if he should succeed in getting the wool off the sheep's back, it may rot in his sheds, for we shall prevent carriers taking it to the railroad ; and should he succeed in getting it to the railroad, we shall prevent its going to sea, for we shall call out the sailors ; and if it sails we shall prevent its discharge in London, for we shall call out the dock laborers." This announcement effectually ranged public opinion with the employer, and, when the actual attempt to enforce the threat was made, the Shearers' Union found itself face to face with a combination of pastoral employers infinitely stronger than that of the workmen.

A student in chemistry has accidently discovered that tiles can be made of common beach sand mixed with water and certain chemicals, the nature of which is not disclosed, and we understand that a company has been organized in New Jersey to utilize the discovery. "All that is necessary is to mix the ingredients with the sand and pour it into tile-shaped moulds over night," and in the morning there is your tile, glazed and hard, without the application of either heat or pressure. It is said that tiles, drain-tubes, imitation terra-cotta, statuettes, etc., become as firm as baked pottery and are much cheaper. Coloring matter can be stirred into the sand with the effect of permanently tinting it, and by pouring the color unevenly through it a fair imitation of marble can be produced, at least, so we are advised from the States.

Metal tin can be burned as easily as paper, and to do it makes an interesting parlor experiment. A candle, blowpipe and tin foil are necessary. With the blowpipe direct the flame of the candle against a strip of tin foil, and it will readily take fire and burn with a brilliant light, the melted incandescent globules falling to the table and dancing about in a very curious manner. It will be noticed that the product of the combustion of the tin is a white powder, the oxide of tin, and it was observed many years ago that this calx, as it was called, weighed more than the original tin. This simple observation was the beginning of a long series of investigations which finally led to the discoveries of Priestly, Scheele and Lavoisier, and laid the foundations of the modern science of chemistry.

Until a short time ago peroxide of sodium was only known as a rare product of the laboratory. It is now put on the foreign market at five francs per kilo. The peroxide contains about 20 per cent. of oxygen available for bleaching purposes. This percentage is very high, barium dioxide containing eight per cent. and peroxide of hydrogen (12 vol.) only 1.5 per cent. It is decomposed by dilute acids. The sodium compound, on account of its strong alkaline reaction, cannot be directly employed in the bleaching of fibres of animal origin, such as silk or wool. In this case peroxide of magnesium is recommended, prepared by adding three parts of sulphate of magnesia free from chlorine to one part of sodium peroxide. In bleaching, first add the magnesia, then the peroxide. When bleached sufficiently, pass through a weak sulphuric acid bath to remove magnesia ; rinse and dry as usual. Care must be taken to secure a slight excess of the sulphate of magnesia.

The three Commissioners who were appointed in accordance with an act of the Pennsylvania Legislature of 1889 to investigate the waste of coal have made a report. The total amount of coal sent to market up to date, as shown by this report, is : From the Wyoming region, about 383,000 tons ; Lehigh region, 147,500,000 tons ; Schuylkill, 289,500,000 tons or a total of over 820,000,000 tons. This represents about 90 per cent. of the product mined and consumed. The other 10 per cent. was used at the collieries. For every ton of coal mined the commission estimated that a ton and a half was lost in waste and in the mines. Of the 60 per cent. of coal lost in mining at least 25 per cent. was lost in unsaleable or crushed coal. The amount of unmixed anthracite coal is not less than 18,000,000,000 tons. To work out a solution of saving this 25 or 30 per cent. that has gone to the waste bank is properly a great question to solve. A saving of 25 per cent., or 4,500,000,000 tons of coal will mean for the future of the anthracite coal trade and the carrying companies at the rate of $1.50 per ton to tide over $6,000,000,000. As a means of utilizing this vast amount of waste coal, the Commissioners suggest the use of rotatory grates that will carry off the ash as quickly as it is formed.

WHAT IS STEAM ?

The above question is frequently asked of engineers nowadays, and although they make constant use of steam, very few will answer that "steam is an invisible, gaseous fluid generated by the aid of heat from water." Many of them, when told that steam is invisible, laugh and say they know better, because they see it every day. If one of these wise men who claim the honor and name of practical engineers will take a look at the water glass in the boiler room, if they have one—if not, let them look at the one on their neighbor's boiler—and then tell if they can see any steam inside of it. If the glass should happen to burst while they are making the observation, they will, no doubt, see plenty of what they call steam in the vicinity, and they might also see the same if the safety valve should happen to blow off. Why, then ? Simply because steam is invisible, and so long as it is confined you can not see it, but when it is cooled off, as when it comes in contact with the air, and is consequently condensed again to the water from which it originated, it becomes visible to the eye, like water in very small particles, as in a fog. Viewed at such times it has lost its characteristics as steam, and instead of being a gaseous fluid it has become condensed to water in very small particles, which occupy considerable space. When in this condition we see what we call steam, but when an engineer notes the flow of steam, from guage-cock or safety-valve, he will notice that near the opening nothing is visible, while at some distance he sees fog. The reason of this is that at all times steam is invisible while it remains steam, but by condensation and the formation of water a fog is produced, which can be seen and distinguished in no way from the fog which rises from rivers, swamps, or other bodies of water during such times as the temperature and other conditions are favorable to its formation.—Machinery.