THE MANUFACTURE AND STORAGE OF GUN-POWDER.

The terrible gunpowder explosion which occurred lately in London on the Regent's canal has excited considerable interest in the subject of the manufacture and transport of an article so terrible in its power. An idea of the principal pro-cesses in its manufacture will be readily gained from our illustration on page 205, for which we are indebted to the London Graphic.

Gunpowder is composed of three ingredients, charcoal, sulphur, and salpetre, incorporated with each other in the relative proportion of about 13, 11, and 76, in a powdered state. Great care has to be exercised in obtaining the right kind of charcoal, as also in purifying the sulphur. — "Giving up Matches at the Entrance" explains itself.—Our next illustration shows the grinding of the sulphur and the charcoal, which are reduced to a tine powder. This is carefully sifted into a" dust-ing reel" to remove any vestiges of grit or impurity which might otherwise find their way into the powder, and cause an accident in the course of the subsequent stages of the manufacture. Saltpetre, also, when not refined on the premises, is subjected to the same process. — Our next sketch shows the "Incorporating Mills," where the composition, having been roughly mixed in the proper proportions, is incorporated by being ground, in a wet state, under edge runners, each weighing from four to six tons. This grinding is continued for a longer or shorter time, according to the quality of the gunpowder to be produced. This process is somewhat dangerous, and it is this which most frequently causes those minor explosions to the sound of which all persons resiaing near gunpowder mills are more or less accustomed. The powder thus completely pulverised leaves the mill in small lumps, being too friable to be conveniently granulated, it is therefore taken to the "Hydraulic Press "and pressed between copper sheets by hydraulic power until it is sufficiently hard where the cakes of powder from the hydraulic press are broken into grains by being passed between brass rollers, the grains being sorted into different sizes by falling over sieves which are set at a pretty steep incline, and kept shaking in order to free their meshes from the grains. - In our next illustration we are still in the "Corning" Honse, where "Hand Sifting" is going on. In cases where it is desirable to obtain a very carefully sized powder, the grains are again sifted, this time by hand, in circular sieves placed on a frame fixed to a revolving shaft having a crank at the point where it passes through the frame. — The next process is the "Glazing," or giving a polish to the grains, by causing them to rovolve for some hours in clused barrels containing three or four cwt. each, a small quantity of black lead being added when a very high degree of polish is required, as in the case of blasting powder, which is intended to be used in damp localities. After being polished the powder is dried in a stove, warmed be steam or hot water pipes.—The final process before weighing the powder into barrels is the "Dusting," or removing any fine particles of powder which may still adhere to the surface of the grains. This is accomplished by passing the powder over sloping sieves if "large," or through hollow cloth cylinders if "small grain." — In the Packing House, the powder is weighed into parcels under five pounds cach, and packed into tin canisters for the "sporting" trade. — The "Expense Magazine" is a store-house for gunpowder before it has undergone the final process, if there is any reason to delay the completion of the manufacture. It is built in the water, and is provided with a lightning conductor. — The "Charge House" is also surrounded with water, and has a water tank on the roof. Here the finished powder is stored in bags on shelves, about a foot from the ground. So much for the manufacture of gunpowder, but we may add that all people connected with the works, and any one entering them, have to be "shed " with large leather shoes, with nails of copper, lest a spark from an unwary heel might fire the powder-charged air. All the bearings of the machinery are also of copper. As regards the transport of powder much has been said of late respecting the terrible and culpable negligence of Canal and Railway Companies, who treat it with the same nonchalance they would display towards barrels of pickled pork. At these, works, however, the utmost precautions are taken, the whole internal carriage, from the time the powder leaves the in- it in while soft, and let it remain until dry.

corporating mills until it is ready to be sent away, is conduct. ed by barges, each sufficiently small to be propelled by one man with a punt pole at a speed of about two miles an hour. These boats are, of course, kept entirely for powder work. For the shipping trade the powder has to be carted to a spet in Dartford Creek, not far from its entrance to the Thames it is there transferred to barges which proceed to the spots in the Thames where the authorities permit powder to be shuped. For the home trade the powder is carted direct from Daritord to the railway or canal which will carry it to its destination. We may conclude our remarks by stating that according to law, it is forbidden to carry more than 25 lbs. by land, or 2.2Ibs. by water at the same time, and that any one smoking ea board a vessel laden with powder is subject to a line of " Illustrations-1. Giving up our matches at entrance. 2. Sal. phur grinding. 3. Incorporating mills. 4. Hydraula pres. 5. and 6. Corning house. 7. Shod for the occasion. 8 uiz. ing house. 9. Charge house. 10. Expense magazine.

WALKER'S PATENT ROLLING OARS

The revolving cylinders invented by Mr. Walker for burg. ing down cheaply the produce of a country to its scapet have been already introduced to public notice, and we nor supply from *Iron* on page 209, an illustrative figure of the spparatus, with an ingenious adaptation, enabling it to pass a break of gauge without points or crossings, or even, if arc + sary, without stopping the trains.

The rolling cars are cylindrical, and made of boiler-plate iron, with a covered opening for loading, &c. They are stiffened at the centres of their ends, in which small axles an fitted; they may be further strengthened by angle or 1-100 riveted to them. These cylinders may be divided into 100 parts by a horizontal diaphragm, in which case a coverd opening in the cylinder will be required for each compar-ment. Around the outside of the cylinders, at the required gauger, metal rings, called "tire-rings," are tightly fited These tirc-rings are similar in section to the tire of a locome tive-engine wheel, perform the duty of ordinary wheels, and run upon the rails, passing with perfect case and safety hoz one gauge of railway to another and different gauge without stopping or any adventitious aid, as will be clearly under. stood on inspecting the engraving.

Mr. Walker proposes to run his rolling cars in pairs, and cersequently mounts two of them in a light framing, which a supported and carried by the axles of the cars.

he cylindrical car and its load, being practically one rolling body upon the rails, a comparatively small engine will be sufficient to convey trains composed of them to the coast. The cars can also be fitted with self-acting brakes, to prevent the running back down inclines. They may be made of any reasonable size, according to the character of the produc to be carried, and, when made water-tight, may be bendcially employed for the conveyance of water in seasonsd drought.

I'he principal object in this invention is to provide the means for the casy, economical, and safe conveyance of the general goods and produce of large and thinly-populated countries, such as India, to the ports of shipment. As that cars require neither wheels, axles (to carry the carriages and their loads), springs, nor tarpaulings, the cost of outfit as maintenance is reduced to a minimum. Goods and product may be thus conveyed for any distance without risk from ma or fire, giving the additional advantage of reducing the us of insurance. The lightness of this form of rolling statis also an evident advantage in reducing the tear and would the line. The invention has been very favourably considered by the Government authorities of In lia, where it is likely a come into extensive use.

The engraving shows the general arrangement of the nil at the point of junction of two railways of different gauge The sleepers are grooved true to gauge by suitable machizen and afterwards creosoted when desired. The rails, with are fitted therein, are formed of timber cased with rolled int and are further secured to the sleepers by pins or bolts.

A CORRESPONDENT of the Scientific American says. I have run a piece of machinery in rawhide boxes for fourteen ran without oil, it is good yet, and runs at 4500 per minute Ips