

Ropp has his nitro-glycerin manufactured on the spot. For this purpose smoking nitric acid is mixed in a sandstone trough, standing in cold water, with double its weight of concentrated sulphuric acid, while at the same time a quantity of glycerin, exempt from either lime or lead, is evaporated in a caldron to the consistency of sirup, making from 30 deg. to 31 deg. of Beaumé's areometer. When this glycerin is perfectly cool, 500 gms. of it are slowly poured into a glass balloon immersed in cold water, and containing 3,300 gms. of the mixture of acids, which must also be cold. While this is doing the liquid must be well stirred. It is then left to stand for ten minutes, after which it is poured into about six times its bulk of cold water, which is made to turn round all the time. The nitro-glycerin is immediately precipitated in the shape of a heavy oil, which is separated by decantation, and then bottled. To use it for blasting, a hole is drilled into the rock, and 1,500 gms. to 2,000 gms. of nitro-glycerin are poured in. A cylinder made of tin or pasteboard, about one and a-half inches in diameter, and two inches in height, and filled with gunpowder, is gently let into the hole, till the operator feels that it touches the liquid. A slow match is affixed to this cartridge, and the hole is filled up with white sand, the match is lighted, and in about ten minutes the gunpowder will catch fire, and give the nitro-glycerin the necessary shock to make it explode. The whole mass of rock is then seen to shake, waver, and then settle down again. No piece is projected to a distance, and it is only on examining the spot that it is possible to form an idea of the immense force developed. Formidable masses are found slightly displaced, and rent in every direction. In this way from 40 to 80 cubic meters of hard rock may be detached at a time. Nitro-glycerin, when long exposed to moderate cold, will crystallize in needles. In its liquid state it is a yellow or brownish oil, heavier than water, and insoluble in it. It does not easily catch fire, nor does it explode without a smart shock, except when by long keeping it gets decomposed. Its taste is sweet and aromatic; it is poisonous, and a very small quantity will cause violent headache.—*London Mining Journal*.

The Inventor of the Steam Hammer.

In an article upon the invention of the steam hammer the *London Mining Journal* observes that, although Patricroft was undoubtedly the birth-place of the steam hammer in its present compact and manageable form, it is now conclusively proved (by the testimony of Mr. Gaskell and Dr. W. Fairbairn) that Mr. Smiles was not justified in giving, as he has done in his "Industrial Biography," the credit of its invention to Mr. Nasmyth. The first practically useful hammer made in England was produced at the works of Messrs. Nasmyth, Gaskell & Co., at Patricroft, but Mr. Nasmyth's hammer was similar to, and no advance upon, the hammers of James Watt and Deverell, patented nearly half a century previously, until the self-acting motion was designed and applied by Mr. Robert Wilson, then manager to the firm, and now managing partner in the works at Patricroft. From the time of Mr. Wilson's invention being applied, the steam hammer has become a necessity in every engineering work-

shop, its introduction making a new era in the history of mechanical progress.—*Mechanics' Magazine*.

Administration.

Exhibitors are invited to write after their names, or that of their firms, the names of those having had a special part in the production of the objects exhibited as inventors, designers of models, mechanical processes or by their exceptional skill as workmen.

The cash price and place of sale may be affixed to objects exhibited. This indication is required for all objects belonging to class ninety-one. In all classes the prices marked shall be binding for the exhibitor; any deviation from this rule shall exclude the exhibitor from competing for the prizes. Objects sold cannot be removed before the close of the Exposition without a special permit of the Imperial Commission.

A free ticket admitting them to the Exposition shall be delivered to every exhibitor. These tickets are personal. It shall be withdrawn if it is found to have been lent or given to another person, and the exhibitor will be liable to be prosecuted. To regulate this portion of the service, the tickets shall be signed by the exhibitors. These shall enter by stated doors, and may be required to prove their identity by signing a register.

Exhibitors shall be at liberty to have their goods guarded by agents of their choice, who shall, however, have been accepted by the Imperial Commission. Personal tickets of admission will be delivered gratis to such agents, subject to the regulations contained in the preceding article. Any person acting as agent for exhibitors can receive but one of these tickets, whatever number of exhibitors he may represent. Exhibitors and their agents shall refrain from inviting visitors to make purchases; they shall only answer questions addressed to them, and hand card, handbill or price list, when asked.

An international jury, divided into nine groups, corresponding to the nine groups of agricultural and industrial productions named in the system of classification, shall be appointed to award the prizes. Future regulations shall determine the number, the nature, and the degrees of the prizes awarded, as also the composition and the powers of the jury appointed to award them.

Studies and experiments shall be made under the supervision of the members of the jury of the prizes, and of a scientific agricultural and industrial commission appointed by the Imperial Commission. Such results of these experiments as may be of interest for the public shall be published.

PUGET succeeded in adjusting the eye of a flea so that by the use of the microscope he was enabled to see objects through it. It multiplied and diminished every object. Thus a soldier appeared like an army of pigmies.

In a history of the Royal Porcelain Works, by Mr. R. W. Binns, it is stated that English pottery now employs 110,000 persons.

The curvature of the earth amounts to seven inches per mile. A man six feet high cannot be seen from a distance of ten miles.