

Calendar of Patent Records.

December 14, 1688.—On Dec. 14, 1688, Abraham Thevart was granted a privilege for 30 years by Louis XIV "de faire seul, à l'exclusion de tous autres, de fabriquer où bon leur semblera, des glaces de soixante pouces de haut, sur quarante pouces de large, et de toutes autres hauteurs et largeurs au-dessus, . . . et pour cet effet se servir seulement des machines que ledit Thevart a inventées", on condition that a description of the process be presented within three months. Thevart set up his factory first in the Faubourg St. Antoine and later at St. Gobain, where large sheets of glass were cast in 1693, the first four pieces being presented to the king. In England the first large glass sheets were manufactured by the Company of British Cast Plate Manufacturers, formed in 1773, in a factory at St. Helens, Lancashire.

December 15, 1883.—It was Gottlieb Daimler who first realised the importance of high piston speeds for the internal combustion engine, and the motor-car industry really dates from his patent, which was applied for in Germany on Dec. 15, 1883. His first engine—a four-stroke engine running on benzene—was built into a bicycle, which was driven for the first time in November 1886 in the streets of Cannstatt.

December 16, 1835.—Henry Booth, one of the chief promoters of the Liverpool and Manchester Railway, and the first secretary of the Company, invented the common screw-coupling for railways. It was adopted by his company and has continued in use to the present day. His patent, dated Dec. 16, 1835, for "an improved method of attaching railway carriages together for the purpose of obtaining steadiness and smoothness of motion", probably was for this invention, but no specification was enrolled and the patent became void within two months of the grant.

December 20, 1822.—The first 'eversharp' pencil was patented in England by John Isaac Hawkins and Sampson Mordan on Dec. 20, 1822, with the title "Improvements on pencil holders for the purpose of facilitating writing and drawing by rendering the frequent cutting of the points unnecessary." The projection of the lead was governed by screw mechanism within the pencil holder.

December 21, 1612.—The patent granted to Joseph Usher, Warner Rich, and Godfrey Devette, on Dec. 21, 1612, for a new engine for supplying water to cities and towns and private houses, etc., contains a provision that a model of the invention is to be supplied within one month from the date of the grant, and furnishes an early example of the official requirement of a description of the invention as a condition of the grant. Sir Hugh Myddleton's patent for the supply of water to London was granted in the previous May, and this may have been the cause of the insertion of the proviso in the later grant.

December 21, 1736.—Jonathan Hull's patent for his "machine for carrying vessels or ships out of or into any harbour, port, or river, against wind or tide or in a calm", was granted on Dec. 21, 1736. Hull proposed to use a Newcomen engine to propel a tug-boat, by means of a stern paddle wheel operated through rope gear and pawl and ratchet mechanism. His experiments were presumably not successful, but he published in the following year a book describing the invention, which may have stimulated the later inventors.

December 21, 1802.—"Tatham's Clumps", which were interlocking bricks for building circular structures such as wells, columns, pipes, etc., were patented by William Tatham and others on Dec. 21, 1802. The bricks were made at the works of Scott and Clarkson, at Hackney.

Societies and Academies.

LONDON.

Royal Society, Dec. 5.—F. A. B. Ward, C. E. Wynn-Williams, and H. M. Cave: The rate of emission of alpha-particles from radium. A new type of electrical counter was used in which the whole of the amplification is produced by triode valves. The amplification was linear, so that the counting of α -rays was undisturbed by the presence of β -rays. About 500 particles per minute could be counted. The rate of emission from radium determined by counting about 10^5 α -particles was 3.66×10^{10} α -particles per sec. per gm. of radium.—E. J. Williams and F. R. Terroux: Investigation of the passage of fast beta-particles through gases. The primary ionisation for beta-particles of 0.5-0.9 of the velocity of light, determined in the Wilson cloud chamber, appears to approach limits of 22 ions per cm. in oxygen, and 5 ions per cm. in hydrogen. Variation with velocity differs appreciably from that predicted on classical theory. From the frequency of branch-tracks, the magnetic moment of an electron seems considerably less than a Bohr magneton. Momentum appears to be conserved in branch collisions.—R. J. C. Howland: On the stresses in the neighbourhood of a circular hole in a strip under tension. The problem is solved by successive approximation for the case in which the stress-system is symmetrical both about axis of strip and about perpendicular diameter of hole. General formulæ are given expressing each approximation in terms of the preceding. The coefficients of the transformation depend upon transcendental integrals which are estimated numerically and coefficients are then tabulated. When the ratio of diameter of hole to diameter of strip does not exceed 0.5, greatest stress at boundary of hole is nearly $4\frac{1}{2}$ times tension at infinity. On the edge, tension rises from a minimum of less than $\frac{1}{2}$ of applied tension at point nearest to hole, to maxima, not much less than twice applied tension, at about one-third of width of strip on either side of central section. On the axis, disturbance due to hole becomes inappreciable at a distance from centre of hole equal to about $1\frac{1}{2}$ times width of strip.

Geological Society, Nov. 20.—D. Williams: The geology of the country between Nant Peris and Nant Ffrancon (Snowdonia). The general stratigraphical succession is given. The topmost Cambrian beds, the Ffestiniog or *Lingula* Grits, are of shallow-water origin. They are faulted against blue-black slates, probably of Lower Llanvirn age. Upwards, the slates pass into the paler Llandeilo slates with *Glyptograptus teretiusculus*, at the top of which occur the Talgau lavas apparently belonging to the Glyder Fach-Capel Curig volcanic suite. These earliest flows are notably sodic. The Snowdon Volcanic Suite is essentially composed of potash-rhyolites and rhyolite-tuffs, succeeded, near the Devil's Kitchen, by pumice-tuffs and flows of andesitic or basaltic character. The Upper Rhyolitic Series of Snowdon itself is here absent. Two large acid plutonic masses, Moel Perfedd and Bwlch-y-Cywion, are believed to represent the denuded plugs of the vents from which the Lower Rhyolitic Series was extruded. Both the folding and the cleavage, which strike approximately north-east and south-west, are attributed to Caledonian earth-movements, the cleavage following closely upon the folding, but preceding the faulting. 'Cleavage-fans' are conspicuous, two 'synclines' being separated by an 'anticline'. There appears to be no evidence in this area of the post-cleavage thrusting observable on Snowdon.—Beeby Thompson: The Upper Estuarine series of Northamptonshire and