

he had invented it some years earlier, gave the means of spinning twenty or thirty threads at once with no more labour than had previously been required to spin a single thread. The thread spun by the jenny could not, however, be used except as weft, being destitute of the firmness or hardness required in the longitudinal threads or warp. Arkwright supplied this deficiency by the invention of the spinning-frame, which spins a vast number of threads of any degree of fineness and hardness.

The precise date of the invention is not known; but in 1767 he employed John Kay, a watchmaker at Warrington, to assist him in the preparation of the parts of his machine, and he took out a patent for it in 1769. The first model was set up in the parlour of the house belonging to the free grammar school at Preston. This invention having been brought to a fairly advanced stage, he removed to Nottingham in 1768, accompanied by Kay and John Smalley of Preston, and there erected his first spinning mill, which was worked by horses. But his operations were at first greatly fettered by want of capital, until Jedediah Strutt (*q.v.*), having satisfied himself of the value of the machines, entered with his partner, Samuel Need, into partnership with him, and enabled him in 1771 to build a second factory, on a much larger scale, at Cromford in Derbyshire, the machinery of which was turned by a water-wheel. A fresh patent, taken out in 1775, covered several additional improvements in the processes of carding, roving and spinning. As the value of his processes became known, he began to be troubled with infringements of his patents, and in 1781 he took action in the courts to vindicate his rights. In the first case, against Colonel Mordaunt, who was supported by a combination of manufacturers, the decision was unfavourable to him, on the sole ground that the description of the machinery in the specification was obscure and indistinct. In consequence he prepared a "case," which he at one time intended to lay before parliament, as the foundation of an application for an act for relief. But this intention was subsequently abandoned; and in a new trial (*Arkwright v. Nightingale*) in February 1785, the presiding judge having expressed himself favourably with respect to the sufficiency of the specification, a verdict was given for Arkwright. On this, as on the former trial, nothing was stated against the originality of the invention.

In consequence of these conflicting verdicts, the whole matter was brought, by a writ of *scire facias*, before the court of King's Bench, to have the validity of the patent finally settled, and it was not till this third trial, which took place in June 1785, that Arkwright's claim to the inventions which formed the subject of the patent was disputed. To support this new allegation, Arkwright's opponents brought forward, for the first time, Thomas Highs, or Hayes, a reed-maker at Bolton, who stated that he had invented a machine for spinning by rollers previously to 1768, and that he had employed the watchmaker Kay to make a model of that machine. Kay himself was produced to prove that he had communicated that model to Arkwright, and that this was the real source of all his pretended inventions. Having no idea that any attempt was to be made to overturn the patent on this new ground, Arkwright's counsel were not prepared with evidence to repel this statement, and the verdict went against him. On a motion for a new trial on the 10th of November of the same year it was stated that he was furnished with affidavits contradicting the evidence that had been given by Kay and others with respect to the originality of the invention; but the court refused to grant a new trial, on the ground that, whatever might be the fact as to the question of originality, the deficiency in the specification was enough to sustain the verdict, and the cancellation of the patents was ordered a few days afterwards. His fortunes, however, were not thereby seriously affected, for by this time his business capacity and organizing skill had enabled him to consolidate his position, in spite of the difficulties he had encountered not only from rival manufacturers but also from the working classes, who in 1779 displayed their antipathy to labour-saving appliances by destroying a large mill he had erected near Chorley.

Though a man of great personal strength, Arkwright never enjoyed good health, and throughout his career of invention and

**ARKWRIGHT, SIR RICHARD** (1732-1792), English inventor, was born at Preston in Lancashire, on the 23rd of December 1732, of parents in humble circumstances. He was the youngest of thirteen children, and received but a very indifferent education. After serving his apprenticeship in his native town, he established himself as a barber at Bolton about 1750, and later amassed a little property from dealing in human hair and dyeing it by a process of his own. This business he gave up about 1767 in order to devote himself to the construction of the spinning frame. The spinning jenny, which was patented by James Hargreaves (d. 1778), a carpenter of Blackburn, Lancashire, in 1770, though

discovery he laboured under a severe asthmatic affection. A complication of disorders at length terminated his life on the 3rd of August 1792, at his works at Cromford. He was knighted in 1786 when he presented a congratulatory address from the wapentake of Wirksworth to George III., on his escape from the attempt on his life by Margaret Nicholson.