Patent Department

Influence of Invention on Industry.

Sir William Bailey, a prominent English scientific writer, recently delivered a lecture before the Manchester Literary and Philosophical Society on the topographical distribution of men of genius in Great Britain. He stated that the county of Lancashire had produced a large number of inventors, who, during the last hundred years, had exerted a great influence on the prosperity of that country, and, indeed, had done more to change the face of the world by their mechanical contrivances than any other combination of inventors.

Sir William Bailey's statement is doubtless true to a certain extent; and it is to be deplored that, notwithstanding the universal good these Lancashire men wrought, all, with two exceptions, were subjected to ill-treatment at the hands of the communities they directly benefited, and died in poor circumstances.

It is interesting to note that in the first half of the seventeenth century Torricelli invented the barometer for indicating the pressure of the atmosphere, and in a few years the Marquis of Worcester and Savary followed their illustrious leader by introducing their experimental engines. After this nothing of importance took place until 1712, when Newcomen invented his simple vacuum or atmospheric engine, which did useful work for a hundred years before James Watt's double-acting engine, with the conical pendulum or governor balls for controlling it, became popular.

In 1700 England was not superior, nor even equal, to the manufacturers on the Continent. A small trade was done in iron, but all bar iron was imported. About this time the Dutch loom was introduced into Lancashire. Paper making had been introduced by foreigners in the reign of Henry VIII., and a few mills existed in the time of Elizabeth, but the best paper, used in the printing of books, came from France. From Holland came improved windmills and the waterwheel, while Dutch engineers were engaged in erecting pumps and providing water supplies, and the Norfolk Broads and the famous Bedford Level were also finished under Dutch management in the reign of Charles II. The goldsmiths of Bristol, York, and London did some good work; but in metal-work and in textile fabrics England was much inferior to foreign countries, both in design and manufacture. Soon after the commencement of the eighteenth century, Manchester and Liverpool increased rapidly in importance, and Manchester in 1720 obtained a bill for making the river Irwell navigable to the Mersey and to the sea. The increased facilities thus afforded gave a great impetus to the industrial prosperity of England.

A great demand for textile goods for export caused those engaged in the trade to desire means of increasing the production, and the fly shuttle, an invention that doubled or trebled the output of the weaver, came from Kay, of Bury, in 1733. Many other machines were invented by the unfortunate Kay, who was much ill-used by those whom he had benefited, and was obliged to leave Bury to save his life. He died in poverty and obscurity in France, the place of his burial being unknown. This new system of weaving quickly exhausted all the productions of the spinsters, for the new looms could use more weft and warp in a day than the spinsters could produce in a week. Inventors were thus naturally led to consider how to increase the production of the spinning wheel, the result being the invention of the spinning jenny. A careful consideration of the claims of James Hargreaves, of Blackburn, and Thomas Hayes, of Leigh, tends to prove that they invented the jenny simultaneously and independently. Between 1766 and 1769 Hayes produced one with six spindles, and, about the same time, Hargreaves made one with twelve spindles. The next important invention was that of Samuel Crompton, of Bolton. It was still found impossible to meet the demand created by the new loom, and, in the year 1775, Crompton invented the spinning mule. At this time, most of the fine yarns were imported from India, but by the year 1805 England began to export yarns to that country. Crompton was in great fear at one time because of the enmity of workmen, and in 1811 the government made him a grant of $25,000. At the commencement of the nineteenth century, many men were applying themselves to the driving of Kay's loom and Crompton's mule by steam power, but it was reserved to two Stockport manufacturers, Radcliffe and Horrocks, to invent the first practical steam loom, in 1805. This produced a famine in yarn which continued until 1834, when the self-acting mule was invented by Richard Roberts. It is now used extensively all over the world, and it is one of the inventions that have placed Lancashire manufacturers in the front rank. Roberts was one of the greatest mechanical inventors of the nineteenth century. Although he never went to school, he was an accomplished mathematician and draughtsman, and would never permit experimental work to proceed until high-class detailed drawings were prepared. Among his many devices may be mentioned the slide lathe, the metal planing machine, the pentagraph automatic drilling machine, and the Jacquard punching machine. Although the men of Manchester agreed to allow him $5,000 a year if he would come to live in that city, he died in poor circumstances in London, and was buried in Kensal Green Cemetery.

William Sturgeon, the inventor of the electric magnet, was born near Lancaster. He enlisted in the army, and while undergoing his training he began to study thunderstorms, lightning, and electricity, and in 1825 presented to the Society of Arts his first soft iron electro-magnet, for which he was awarded a premium of $150 and a silver medal. He started the Annals of Electricity, to which all the foremost inventors of the age contributed. His life, however, was one perpetual struggle with adversity, and, in 1850, the Bishop of Manchester and the Literary and Philosophical Society of Manchester petitioned the government on his behalf, obtaining for him a grant of $1,000 and an annuity of $250, which, unfortunately, he only lived to enjoy a few months.

Great improvement in the quality of manufactured iron was effected by the invention of the puddling furnace by Henry Cort, of Lancaster, in 1784. Its object was to remove the impurities of English iron, and its success was immediate and remarkable. Cort also made rolling mills with grooved rollers, and his inventions gave a great impetus to the production of iron, which rose in two years from 90,000 tons to 5,000,000 tons per annum. He died poor and neglected. Among other prominent inventors the name of James Joule, who was born in Salford, may be mentioned. In addition to discovering the mechanical equivalent of heat, he was the first to invent electric welding, and his investigations in electricity generally have been considered of considerable scientific value. The patent lever watch was not invented in France, as has been asserted, but by Litherland, of Warrington, in 1791. The name of John Ramsbottom is well known in connection with railway engineering. He invented the double safety valve, the method of feeding moving locomotive tenders with water, made many improvements in looms, and designed the condenser lubricator for engines. His most important invention was the "weft-fork" for steam looms, which was the means of greatly increasing the productive power of the weaver.

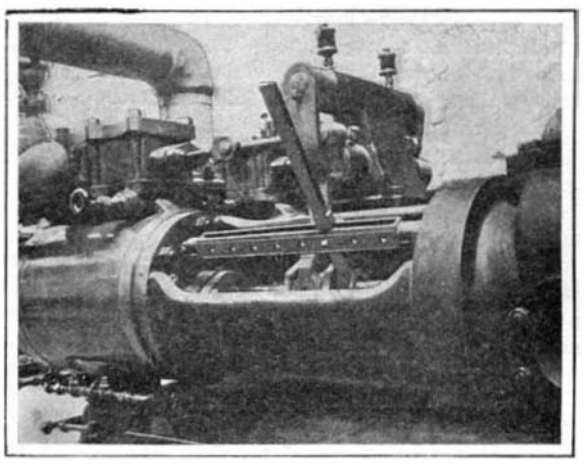
A Fire Shield.

A Southern inventor has made improvements in a fire shield, which if it can be dropped or moved into position at the proper or critical moment will be a decided practical gain in fireproof construction for use as a barrier in proscenium arch openings of theaters. The shield is embraced by and vertically movable in trough-shaped guides, and is provided with any suitable suspension device. It comprises two skeleton frames, each preferably consisting of a number of metal bars or strips, which intersect at right angles, the meeting and crossing portions being rigidly connected by stove bolts. By this construction a large number of panels are formed, each closed by a pane of mica, the panes being clamped between the two curtain frames. On the breaking out of a conflagration, it is only necessary to place the shield into position, when between the stage and the auditorium a transparent mica obstacle is interposed. This permits the firemen and attendants to intelligently direct their work to prevent the spread of flames or to extinguish them. The transmission of light through the mica illuminates the theater in case the usual lights are put out of use, and provides ample means for actors or audience to see their way to safety. The shield is rigid in every part, and where it has been moved into place to close the arch opening, no amount of heat short of that which is sufficient to melt or fuse the steel framework can operate to effect the most minute passageway for the escape of flames, gases, hot air, or any products of combustion. In this particular it is an improvement over asbestos curtains, that are blown away at the sides or edges from the stage opening by the force of heated drafts common to theater fires. At the lower edge of the shield is attached a tubular rib, compactly filled with a packing composed of powdered mica and asbestos. It affords great rigidity to the sheld, and effectually resists the action of the hot air and flame, which seek to gain egress underneath the shield. The shield may be made also in the manner of a pair of sliding doors, which may be arranged to slide from opposite sides of the stage.

James L. Branson, the inventor of the knitting machine which bears his name, was found dead in the stable attached to his residence at Doylestown, Pa., some weeks ago, having been killed in some manner by a horse. His knitting machine was invented during the civil war, and it is said to have yielded him a profit of $60,000 in three months.

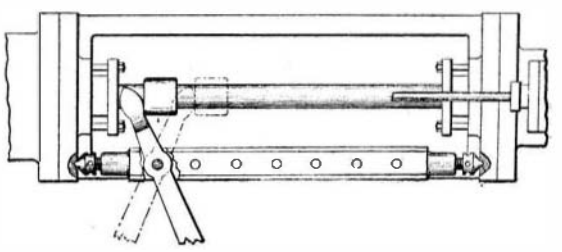
DEVICE FOR MOVING PUMP PISTON RODS.

A very useful device has recently been invented for moving or adjusting a pump piston rod while setting



DEVICE FOR MOVING PUMP PISTON RODS.

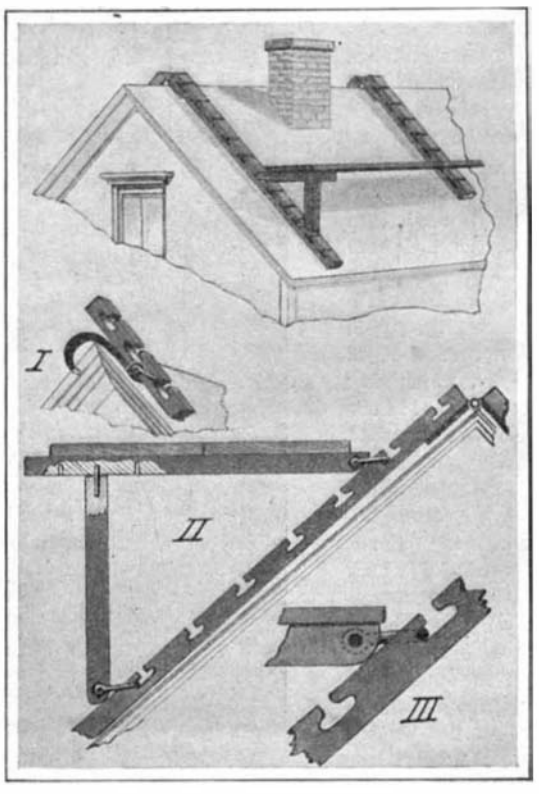
the valve therefor. The device will enable an engineer to place the pump piston rods at any desired position, to facilitate the packing of the stuffing boxes when it is necessary to remove the gland or follower, or in order to set the pump valves when the piston must be moved to a central position. The device comprises a longitudinally slotted fulcrum bar, the opposite members of which are perforated to receive a fulcrum pin on which the operating lever is mounted to swing. This lever is provided with spaced or forked members, adapted to receive the piston rod and engage the driving block thereon. The piston rod, as is usual, connects with the plunger in the piston cylinder, and with the piston in the steam cylinder. Adjusting bolts are threaded into the ends of the fulcrum bar, and their pointed heads engage depressions in the cylinder heads. The position of the lever with relation to the fulcrum bar may be changed by simply removing the fulcrum pin, and passing the latter through another pair of perforations. When not in use the lever may be removed and placed alongside of the bar, thus taking up but very little room. The inventor of this device is Mr. Hans Linke, 312 West 123d Street, New York, N. Y.



DETAILS OF THE PISTON ROD MOVING DEVICE.

IMPROVED SCAFFOLDING.

A novel form of scaffolding has recently been invented, which is particularly adapted for use on roofs of buildings. It will be found very convenient when repairing chimneys or doing other work on a roof, as it may be easily handled or placed in position, and when not in use it can be compactly folded for storage or transportation. The scaffolding comprises a pair of bars, each consisting of two sections which are



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