WEAVING.—No. II.
A BRIEF ACCOUNT OF ITS HISTORY.—(Concluded.)
In 1760 the "drop box" was invented by Robert Kaye, a son of John Kaye, by means of which several shuttles, with different coloured weft, could be used in the fly loom, and this system is still in use both in hand and power looms.

By the invention of the fly shuttle, and the addition of the "tappet shaft" to the narrow goods, or Dutch loom, a great step had been made towards the application of motive power to weaving. The spinners could not supply yarn in sufficient quantity to keep the looms at work. In addition to this increased demand for yarn, the hosiery trade required further supplies, in consequence of the invention of the rib hosiery frame by Jedediah Strutt, and other modifications of the Lee stocking frame. This increased demand led to the grand series of inventions used in the spinning of cotton.

When it was found that the cotton spinners were able to supply all the requirements of the weavers, and there appeared to be a probability that the weavers would be unable to use the yarn as fast as it was spun, it became apparent that an advancement was requisite in the process of weaving.

This was first accomplished by Dr. Edmund Cartwright, of Hollander House, Kent, who obtained his first patent for a power loom in 1785. The circumstances which led him to apply himself to the invention of a new mode of weaving are best related by himself, in his well-known letter to Mr. Bampfylde, as follows:

"Happening to be at Matlock in the summer of 1784, I fell in company with some gentlemen of Manchester, when the conversation turned on Arkwright's spinning machinery. One of the company observed, that as soon as Arkwright's patent expired so many mills would be erected, and so much cotton spun, that hands never could be found to weave it. To this observation I replied that Arkwright must then set his wits to work to invent a weaving mill. This brought on a conversation on the subject, in which the Manchester gentlemen unanimously agreed that the thing was impracticable; and in defence of their opinion they adduced arguments which I certainly was incompetent to answer, or even to comprehend, being totally ignorant of the subject, having never at any time seen a person weave. I contended, however, the impracticability of the thing by remarking that there had lately been exhibited in London an automaton figure which played at chess.

"Now you will not assert, gentlemen," said I, 'that it is more difficult to construct a machine that shall weave, than one which shall make all the variety of moves which are required in that complicated game.'

"Some little time afterwards a particular circumstance recollecting this conversation to my mind, it struck me that, as in plain weaving, according to the conception I then had of the business, there could only be three movements, which were to follow each other in succession, there would be little difficulty in producing and repeating them. Full of
it had long been felt desirable to dispense with the boy, not only on account of his presence being often required when he was absent, but because it was believed that when having wrong-wrongs, the cords, might sometimes be avoided. Consequently various descriptions of "draw boys" were devised, the action of the machine we intend to illustrate. The draw lamp was not only cumbersome, and entailed a vast amount of labour in the arrangement of the equipment in extent. The time had arrived when some more efficient means of producing figured fabrics were necessary, and these means were supplied by the Jacquard machine.

Joseph Marie Jacquard was born at Lyons on the 18th of July 1752. He was employed in some operations connected with weaving. At twelve he was put to a bookbinder, then to typesetting. His work was of all descriptions, but all that was required, and then secured what I thought a most valuable property by a patent—6th of April, 1785. This being done, I then descended to see how other people wove; and you will guess my astonishment, when I compared their easy modes of operation with mine. Availing myself, however, of what I then saw I made a loom, in its general principles nearly as they are now made. But it was not till the year 1800 did I make another attempt, when I took out my last patent, August 1st in that year.

Dr. Cartwright took out four patents for weaving in 1786, 1788, and 1793. He established a mill at Doncaster in 1782, for weaving and spinning, but was compelled to abandon it in 1787. He then took out the machine in 1789. As a compensation for the great loss he had sustained in endeavouring to introduce the power loom, a grant of £9,000 was allowed him in 1803 by the Government.

But although Cartwright was unsuccessful in his undertakings, the subject of too great importance to be neglected. Other inventors took it up with more or less success, and every detail which had proved beneficial to the weaver was ultimately cleared away, and it has at the present time become one of the most perfect machines used for manufacturing purposes.

A very important step was made in 1804 in weaving cotton goods. Previous to that time the requisite dressing or sizing of the warp was prepared in the loom, and it necessitated frequent stoppages and delay to the weaving. This was obviated by William Baddeley, of Stockport, who invented a dressing machine, by means of which the warp was prepared in a far more satisfactory manner, before it was put in the loom, thus adding greatly to the productive power of the latter. The dressing machine has also undergone repeated improvements, and is now the great performer of any part of the processes in weaving. It is called the "Jacquard," after the name of Jacquard. Whether he was the inventor or not of the parts forming the principle upon which the merit of the frame may be seen by referring to the "Report on the Paris Exhibition, 1855," Part II., page 190. On Machinery and Workshops, by John Wilkinson, R. Willis, who states that M. Marin, Professeur de la Theorie des Fabrications, at Lyons, exhibited a series of nine models, showing the Jacquard loom, and Mr. Bonchon. These models went to prove that M. Bonchon, in 1725, employed a land of pierced paper pressed by a hand bar against a row of horizontal wires, so as to push forward those which happened to lie opposite the blank spaces, and thus bring loops at the lowest extremity of vertical wires in connection with a comb-like rack below, &c.

In 1725 M. Falcon substituted a chain of cards, and a square prism (known as the cylinder) in lieu of the band of paper of Bonchon. In 1749, Vaucanson suppressed altogether the cumbersome tail cards of the draw lamp, and made the loom completely self-acting, by placing the pierced paper card upon the surface of a large pierced cylinder, which revolved backwards and forwards, and revolving the small angle by ratchet gear. He also invented the raising and falling grifts, and thus brought the machine very nearly resembling the actual Jacquard.

Mr. Willis adds: "The merit of Jacquard is not, therefore, that of an inventor, but of an experimenter, who, by combining together the best parts of the machines of his predecessors in the same line, can succeed for the future in an arrangement sufficiently practical to be generally employed."

The Jacquard was probably introduced into England about the year 1810. Harding, in his History of Tiverton, speaks of its introduction there about 1812. Gilroy states, in his "Art of Weaving."