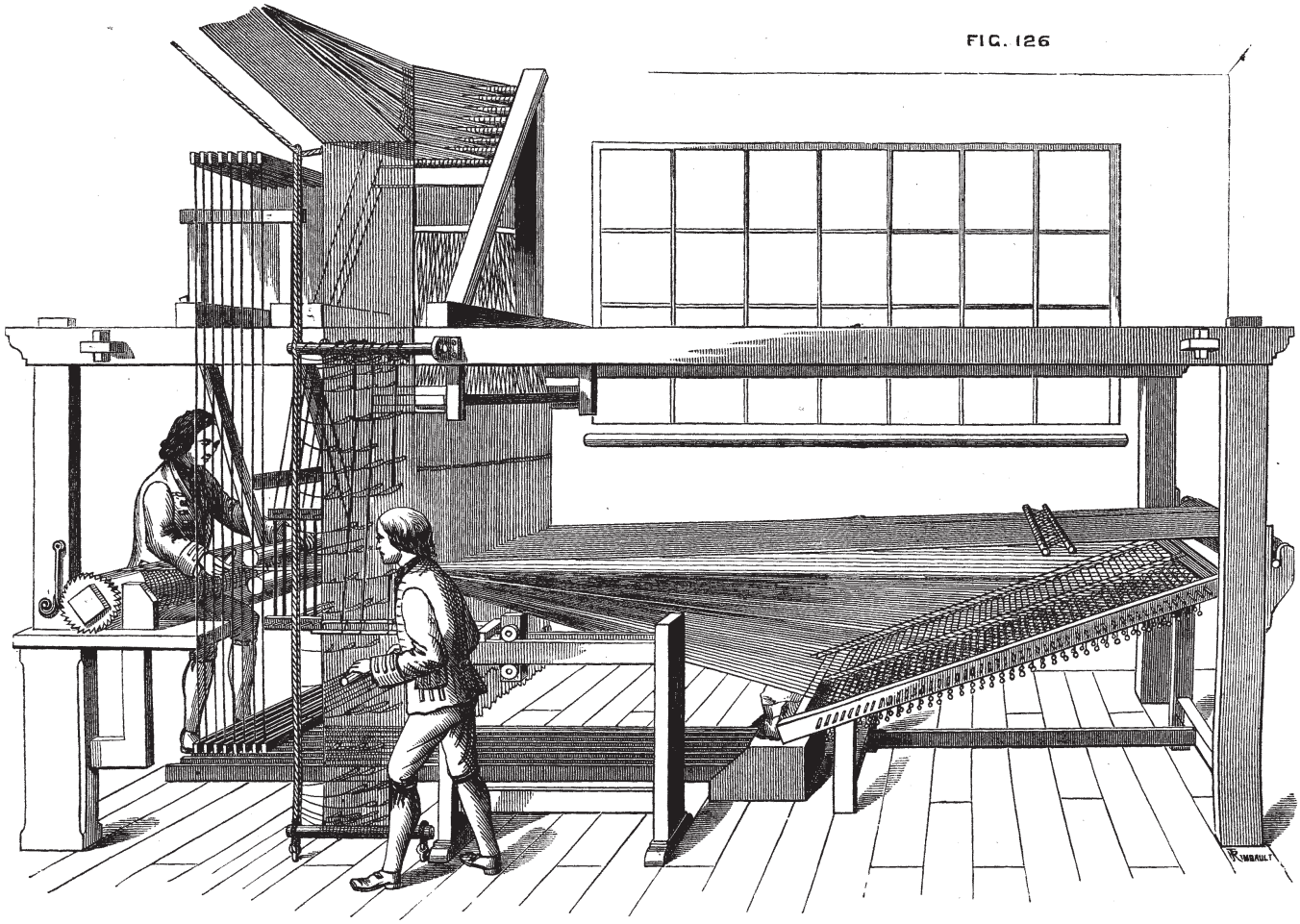
DRAW LOOM FOR WEAVING DAMASKS.

FIG. 126

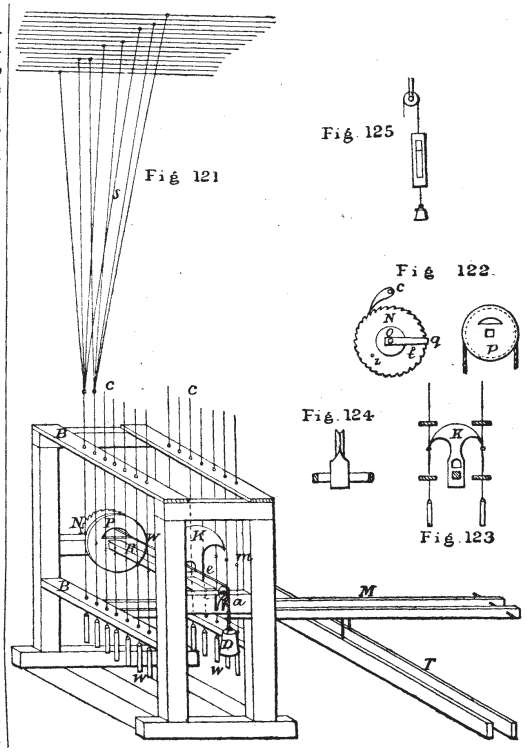


WEAVING.—No. XIII.

The weight of the lingoes, when some thousands are used, becomes great, and it was necessary that some means should be adopted to assist the draw-boy in raising them. The simple often consisted of three or four hundred cords, and as each of these cords had several leashes and lingoes attached, the constant lifting was attended with inconvenience. The friction of so many cords was almost equal to their weight, which made matters worse. To assist the draw-boy, as the weaver's assistant was called, a fork, shown at Fig. 120, was used, see *ante* page 337. It was made to run to and fro upon a carriage, so that when the leashes of the simple were drawn outwards one spike of the fork was passed through the shed or opening formed, instead of the hand as previously described. The fork being depressed by means of the handle *h*, it caused the uppermost spike to fall, whilst the other remained stationary, and in this manner the cords were drawn downwards and held there until the weaver had worked the ground of the cloth by means of the front healds as already mentioned.

In the draw loom the pattern is arranged on the simple by means of leashes, as shown in Fig. 115. In this instance only four changes are required, but when several hundreds are required much complexity arises therefrom.

To escape the drawing of wrong cords or leashes, as we have before stated, was one reason why a machine was ultimately adopted to draw or work them instead of the weaver's assistant. Ultimately the machine was brought to considerable perfection and they were made to draw from one to three or even four hundred leashes, in consecutive order. At first they were made to act with one treadle, but they were afterwards adapted for two treadles, which made their action much better for the weaver, besides giving them double the power by rendering them capable of working double the number of cords, one row on each side of the machine.



When they were first introduced the weavers hoped to reap great advantage from them, for instance they would save the draw-boy's wages. But they began to find that they had adopted a mistaken notion. They found that if they had not to pay the draw-boy they had to pay the manufacturers for the use of the machine, and after all they had an amount of work to perform more akin to "treadmill work" than weaving. Such was the evidence given before a Committee of the House of Lords, in 1823, upon the subject of the silk trade.

The draw-boy and the draw loom, long after the Jacquard machine became known and used, were still held to by the weavers. The Society of Arts also encouraged improvements in them, but they were shortly to be put aside when the advantages of the new French draw loom, as the Jacquard was then called, became known.

The draw-boy machine was not only adapted to draw the tail cords of the draw loom, but it was also employed, as before stated, when considerable numbers of common healds were used, and the ends of the coupers were attached to the machine instead of being fastened to the long marches, as shown in Figs. 68 and 71, see *ante* page 217. This will be readily understood when the action of the machine is shown.

Fig. 121 shows a common and simple form of the draw-boy. It is worked by the treadles of the loom T being connected to the marches M, and instead of the marches being attached to the tumblers or coupers on the top of the loom, they are connected to a cord which passes over the pulley P of the draw-boy. This pulley, there-

fore, causes the rocking shaft R to work, and with it the pecker K. The cords C C are passed through the holes in the boards B B, for the purpose of holding them in position, and they have knots or beads tied upon them at *m*, and weights *w* at the ends to keep them in tension.

The cords S being arranged so as to form the pattern by raising the healds, or drawing the tail cords as shown in this instance, are attached to the cords of the draw-boy at C C. To avoid complication, there are only two such connexions shown in the figure, although any desired number within the compass of the machine may be used.

Now it will be evident that when the shaft R rocks from side to side of the machine, it will carry the pecker K with it, and the groove and notch at the points of the pecker coming into contact with the knots upon the cords, draws them down alternately, first on one side of the machine and then on the other, until the pecker, as it slides along the bar, has passed all the cords. It is then released and returned to its first position by means of the weight D attached to the pecker and to the cord *e*. Thus the pattern cords, as they may be called, are worked over repeatedly, and by this means large numbers of healds may be used by the use of two treadles only.

At the end of the rocking shaft there is a ratchet wheel N, shown also at Fig 122. Upon this wheel a pulley *o* is placed, and it is upon this pulley that the other end of the cord *e* is wound. The teeth of the ratchet wheel accord with the spaces that the pecker is drawn through, so as to bring it exactly into contact with the knots on the strings. There are two pins *t* and *z* fixed in the wheel R, and it is according to their distance apart, or relative position, that the extent of the longitudinal traverse of the pecker is determined. For instance, the bar *q* being attached to the pulley and the pulley being loose upon the axis of the shaft R, as the wheel N is advanced the stud carries the bar with it, until it comes into contact with the catch *c*, when it raises the catch and holds it up, thus allowing the wheel to reverse until the stud *z* comes into contact with the bar and puts the catch again into action. Therefore, the distance between the studs *t* and *z* are fixed according to the number of the cords C C which depend upon the length of the pattern or design to be used.

Fig. 122 is an elevation of the pulley P, Fig. 121, showing the segmental hole through which the cord *e* passes.

Fig. 123 shows a section, and Fig. 124 an end view of the pecker K. The ratchet wheel N is moved by means of a catch shown at Fig. 125, which is simply a pin fixed in a slotted piece of wood. The pin forms the catch, and the slot acts as a groove for the edge of the ratchet wheel to work in, to keep the catch in position. The catch is attached to the marches and works vertically by means of the pulley, weight, and cord, as shown in the figure.

Such were the means the weaver formerly had at his command for performing the shedding motions of the loom. It will be seen that they all resolve themselves into tie-ups, for in no instance does a distinct mechanism appear, or one that was capable of alteration without affecting the cording of the loom.

Before we enter upon the subject of the contrivances that have almost entirely supplanted the above systems, it will be interesting to give a representation of a first-class draw loom of the last century, such as was used in France for the weaving of velvet figured damasks. In this loom, Fig. 126, four hundred pulleys are used, and, of course, a corresponding number of tail and simple cords.

There is also a frame capable of containing a thousand separate bobbins and warp threads, in addition to the warp itself, for the formation of the velvet pile. As each separate thread in figured velvet is consumed in various lengths, each thread is required to be wound off a separate bobbin, which is, in fact, a miniature warp beam. The frame containing them is shown placed beneath the warp of the loom. The fork for drawing the cords is also shown, and, taken altogether, the loom will, when contrasted to the Jacquard loom, afford a most instructive instance of the advancement that has been made in this branch of manufactures during the present century.