front of the heddles, opens the loops ; and the latter, select­ing the proper thread, which, as we have explained, cannot well be mistaken, delivers it to be drawn through the open loop or eye. This being done, the yarns are drawn through the reed by a hook called the reed-hook or sley. Two threads pass through each interval of the reed, the one below and the other above the warp : and in order to preserve this division, there is another rod of wood, which divides the warps into what are called *spitfuls,* the division being just the reverse of the lease-rods. By these several contriv­ances, the threads of the warp are so easily distinguished, that if one break in the course of weaving, a very common occurrence in the case of a break-warp, it is easily traced and taken up.

The accuracy of the lease being thus carefully preserved, the cords which move the heddles are attached. This is so arranged that the motion communicated by the heddle is continuous, that is, while one heddle is depressed, the other must be equally raised, so that the warp is opened equally, as already described. The reed is now attached to the lay or batten, and is kept firmly in its place by the cap, and the whole is so nicely hung as not to overstrain the weaver’s arm in striking the weft home. An ill-poised bat­ten creates great fatigue ; and to avoid this, and perform its work effectually, it should be hung midway between the heddle and the woven portion of the work. The whole distance between the last woven shoot of the weft, called the *fall,* and the heddle, forms the space in which the bat­ten describes its arc ; and the greater it is, the harder the stroke. In light goods it is accordingly small, in heavy goods greater ; and as this also in part depends upon the length of the *sword,* or pendulous portion of the batten, the whole must necessarily bear a proportion to the size of the loom. The loom for narrow and light goods is small in all its parts ; the loom for broad and heavy goods is of course large and strong. Properly poised, the batten returns to its position by its own weight as soon as the stroke is made. All that now remains to be done is to knot the near ends of the warp into small portions, and to tie them to a shaft attached to the cloth-beam. The warp-beam being pro­perly adjusted, and the due degree of tension being given to the warp lying thus evenly between the two beams, the weaver’s operations may commence.

The weaving of coarse, light, narrow cottons, linens, and stuffs, is so extremely simple, that children are soon able to perform it; but the finer descriptions of fabrics re­quire more skill, and it is only a very few that can be­come first-rate workmen. It has been calculated that out of 10,000 hand-loom weavers in Leeds and the clothing villages around, less than 150 were able to earn the very highest wages in the market; and the difference of skill and speed was so great, that of two weavers working together in the same factory, at the same kind of work, one earned nearly twice as much as the other. “ One man having had a full average of good work, has made in these six months 16s. 4d. a week; the man on the next loom to him has earned in the same time, and with the same work, 24s. a week ; the best weaver we have has earned, with not quite such good work, in the same time, 28s. a week. Here then we have a difference arising out of skill, strength, and diligence alone, excluding greater duration of labour, of nearly 50 per cent.”@@1

The distinct operations performed by the weaver are as follows.

1. The treadle is pressed down by the foot, so as to raise one heddle and depress the other. This must be done with force duly proportioned to the work in the loom. Too strong a pressure on the treadle subjects the yams of the warp to unnecessary friction, both from the heddles and

the reed, and also to undue stress of the warp. The threads or yarns consequently break, and this is one of the great causes of delay, and of the small earnings of some weavers compared with others.

2. The weft is now shot by the jerk of the picker already described ; and although swift wefting is a great object with the weaver, it must not be attained by the mere force of the shoot or pick, as that would cause the shuttle to recoil, and bring back, and therefore loosen the yarn of the weft.

3. The weft is beaten close by the batten or lay. Here again the degree of force is of the utmost importance, and this is a matter of extreme difficulty to regulate, because the wrought portion of the web is wound on to the cloth- beam at intervals, so that as the wefting proceeds, the arc described by the batten is diminished, and the force of the stroke becomes less and less. The cloth should be taken up as frequently as possible, so as to preserve the equality of the wefting.

A patent was obtained in 1803, for a simple method of continually turning round the cloth-beam as the work pro­ceeded, so as to wind on or let in the cloth shoot by shoot, with every stroke of the batten. This was easily effected by a racket, fixed on the end of the cloth-beam, with a catch moved by the stroke of the batten by one tooth at a time. Such an apparatus is attached to every power-loom ; but, strange to say, simple as it is, it has not been universally adopted among the hand-loom weavers.

Making allowance for the difference of force and nicety, all kinds of weaving are really the same in principle. Nay, even the most complicated figures depend chiefly on the number of yarns raised together, and the number depressed, while the power-loom has not one feature different from what we have described, except as regards the *source of motion ;* a point which should be always kept in view.

In the progress of the work, some kinds of yarn, in addition to the dressing and sizing of the warp before it is tied in, require a further dressing as they stand in the loom. This dressing is not required by woollen warps, and is decidedly injurious to silk ; but in the case of flax and cotton it is absolutely necessary, in order to lay the fibres close. It is composed of some glutinous substance, which is applied with a brush to that portion of the warp which lies between the heddles and the warp-beam. As the dressed portion of the yarn is wrought, the process must be re­peated. Besides laying the fibres of the yarn, the dressing gives strength and tenacity, and greatly facilitates the ope­ration of the batten. It diminishes friction, and renders the cloth, when finished, equal, even, and smooth.

Various substances have been recommended for dressing the warp, but they all consist of the farina of grain or pota­toes, made into a gelatinous paste, similar to that used by bookbinders. An inconvenience to which this is liable arises from the hard and glassy substance it forms when dried ; hence it must be applied only to so much of the warp as can be woven at once. Every weaver however has his own method of using the dressing, so as to remedy this difficulty. Some mix salt with the dressing, others apply grease as the warp is drying ; indeed this last method is generally adopted to facilitate the process of weaving.

So important has the dressing of the warps been deemed, that it has been the subject of several patents. In 1799, Mr Foden recommended the addition of some powdered gypsum, alum, and sugar; and in 1801 Mr Wilks had a patent for a method of preparing the starch of potatoes. In 1800, Mr Stuart took out a patent for starching cotton yarn in the cop; and in 1805 Mr Peter Marsland obtained another patent for the same object, by subjecting the cops to the action of hot starch in an exhausted receiver, whereby the starch was made to penetrate to the very centre of the cops.

@@@1 Assistant Hand-Loom Commissioners' Reports. Chapman, part iii. p. 530.