WEAVING.—No. XIX.

Tissue Weaving.

The general principles upon which the harness or mounting of the loom is constructed for the formation of the figures upon the cloth having been shown in the two last articles, it is now necessary to describe how the same is employed when various colours of weft are to be used for the purpose of making the design to the best advantage, and with the greatest economy of materials to be used. For instance, if the warp and weft consist of materials alike in colour and texture then the figure would show in a manner similar to the appearance of the woven figures upon white linen tablecloths, not very distinct but still quite observable. If the warp be composed of a material of a different material to the weft, then a much greater distinctness is produced, although both warp and weft may be alike in colour. This effect may be noticed in figured stuffs, which are composed of cotton warps and worsted wefts.

Again, if a different coloured warp and weft be used a far more distinct appearance will be produced, as shown in coloured tablecloths.

A great variety of effect may evidently be made by varying the colours of the warp itself, by arranging making it in stripes, i.e., as previously alluded to, but the best effect is produced by using various kinds of shuttles as will now be shown, when the advantage to be derived from their use will be apparent.

In Fig. 161 (see Engineering, page 401, vol. xvii) a loom with drop boxes for using two or more kinds of shuttles was shown for weaving plaids or other goods requiring two or more separate colours. In such cases each shuttle supplied a substantial portion of the thread or weft to form the cloth. Now in distinction to that class of weaving there is a widely different one, viz., where separate shuttles are employed to produce the figure upon the face of the cloth resembling embroidery, and the figure so produced has little or nothing, in its texture, to do in the forming of the substance of the cloth. In fact, so distinct are the threads kept that only just sufficient intersections are made to keep them held together. They float or form upon the surface of the cloth rather than form a component part of its substance. It is known as tissue weaving, and the richest figured silks are produced by its means.

Let Fig. 165 represent a portion of figured silk such as made for scarves as before alluded to. Fig. 164 is the reverse side of the same cloth. It is supposed to have been woven by a Jacquard machine with 400 needles, such as we have already described, and composed of 400 warp threads per inch in width, thus the spaces P and P' are 2 in. wide each, consequently the split harness being employed the 400 needle machine governs 800 threads or double the width of cloth, as before described.

The face of the cloth Fig. 163 shows that the plain portion, or ground, is woven to form a twill, but any other ground, as described in the last article, may be substituted by altering the weaving of the harness shafts without affecting the figure itself.

A simple circle or spot is the figure shown to be produced, but it may be designed as a flower as at A, or a running flower as at B. In either case the full width of the figure that could be woven would be equal to 3 in. or the spaces P and P', Fig. 164. The space C shows the extent or length of the pattern in this instance, which would take about 200 cards to produce. The threads D D are shown to run across the cloth with a broken appearance, which is to show that they intersect the body of the cloth at certain distances merely to bind them together, otherwise they would float perfectly loose and detached from the cloth in the spaces betwixt the spots. The thread D D is, therefore, the thread that forms the spots, and the shuttle which has inserted it is only used on the line of spots, as shown, and is merely inserted to throw upon the surface a different colour or material to that which forms the ground of the cloth.
at a have really been thrown away, for they are of no practical use. Thus, it will be evident, a conclusion that can be derived from the plan of weaving shown at Fig. 165. It is affected by the use of separate shuttles for each line of spots, and two or more shuttles being brought in under the cloth where the spots are required.

There are, consequently, two methods that can be used for passing or throwing the thread to form the tissue figure, namely, by ordinary shuttles thrown across the whole width of the cloth, or small shuttles that meet the requisite of being thin enough to pass between the warps. The former of these methods may be distinctly understood by referring to Fig. 166, where the piece of cloth shown at Fig. 165 is represented in such a way as to show the method of throwing the thread. The loom, provided with two shuttles, one of which, namely, that which inserts the thread to form the figure, is seen entering the warp by the shuttle being in a lower or boxer lower, but the thread leading from it is seen at a.

The face or right side of the cloth is worn downwards, as shown at T, where the corner of the cloth is represented as turned over, and, as before explained, is worn in this manner for the purpose of raising only as few of the lingoes or weights as possible at each shoot, which would otherwise have to be raised and then allowed to pass by the shuttle, as is done in Fig. 165. This reduces the work of raising and steadying the bars when moved by the peg a, but when each bar has traversed its allotted distance the pin prevents the pin from being raised farther, and the bar is allowed to pass by the shuttle being carried farther through the slot and moving the pin in the reverse manner to the bar D. The purpose of the peg e and the slot e is that it may not raise the shuttle in a position that is too far. This may be observed by referring to Fig. 174, where in moving the peg to a the slot E has advanced a considerable distance, and the peg a being stationary, the bar being carried farther through the slot e having arrived at the pin. The bar being curved, of course corresponds with the motion of the traversing pin a, and assists in the vertical motions of the two bars.

The bar and the motion of the shuttle is shown in Figs. 171 to 173. Fig. 171 shows a plan of the shuttle with the webb pin fixed in it, and Fig. 172 represents a side view of the same. Both figures are of about two-thirds full size.

The bobbin is fitted upon a wire spindle one end of which is inserted into a hole and the other end into a slot or groove, shown by the dotted lines at a. The bobbin spindle is held sufficiently in the groove by means of the presser a which press against the bobbin, and not only holds it in position but the friction caused by the pressure prevents the thread from being unwound too easily. Another view of the spring and presser is shown at Fig. 173; a thin brass plate which is firmly fixed into the groove by being inserted into saw cuts, as shown at c, Fig. 171. Upon the plate there is a boss (Fig. 174) through which the presser a is received. The presser is formed by turning a spiral tube at one end of a fine wire, and after passing the long end of the wire through the presser a is inserted into the wire tube to give the presser sufficient rigidity. The short or other end of the wire forms a bow, against which a thin flat spring is presented to the presser a, which is rivetted at e to the brass plate, presser.

These pressers are of various forms, but the one shown, being easily made, can be repaired by the weaver when out of order, and well answers the purpose it is intended for.

At e Figs. 171 and 172, the weft thread is shown passing through a loop made of horsehair, which is fastened to the shuttle through holes bored at sides as shown.

The purpose for using the horsehair is of some importance, for it not only, by the slight friction it gives upon the weft thread, keeps it in position, but when the weft is being inserted between the loops by slightly twirling the hair, as shown at a, in Figs. 171 and 172, it has a tendency to take up or fill the back of the thread, which is better understood when the details of the circles or modification of the swivel is shown, and which will be next described.