

as in the first example, on what set or division the drawing commences or terminates, which, in this plan, terminates on the set A: then as there is only one draught over the leaves of this set, he works once over the corresponding set of treadles, which are, in the binding plan, represented by the treadle *a*. The next division which reverses the tweel is B; and therefore, as there is also but one draught over this division, he works once over the treadles *b*, which raise it; and so on, agreeably to the succession of the draught; always observing, that when there are two, three, or more draughts, in succession, on one set of leaves, there must be a repetition of the treading, two, three, or more times, over the corresponding set of treadles. Hence it is plain, that, in working over the first set of treadles A, all the cloth will exhibit the appearance of a regular biased tweel, flushed on the upper side by the weft, except those parts of the pattern which are woven by the set of leaves marked A, in which the tweel will be reversed, or the warp flushed above. The same is to be understood of the effect produced by the other sets or divisions.

This pattern is represented on design paper at fig. 5, in which, as formerly noticed, each space from right to left contains four threads of warp, or one set of the tweel; and each space from the bottom upwards contains four shots of weft, or once over one set of the treadles. Hence, from a due consideration of this example, and the plan of treading subjoined, it will be easy to perceive how dornic or diaper patterns, in general, may be represented on design paper from the draught. For, as the figures on the leaves of the binding plan must all have corresponding spaces on the design paper, counted from right to left; so all the figures on the treadles must have their respective spaces counted upwards, to represent the weft. Suppose then, the treadles of the binding plan extended, as at *a, b, c, d*; and, having marked the succession of the draught upon these

treadles, we will find that the treadle *a*, on which the first figure is placed, raises or reverses the division *a*, or the set of leaves A, in the full mounting: and as the first figure on this treadle is 1, it shows that, as the corresponding treadles are to be wrought only once over, all the figures on this leaf, or division, *a*, will occupy one space by the west on the design paper. Then mark the first space at the left hand corner of the design; pass 5, for the five intervening draughts on the other three divisions; mark the seventh, pass 7; mark 4, and so on, to the right hand side of the pattern. The second, third, fourth, fifth, sixth, and seventh figures in the succession of treading denote only one space each; and, therefore, they are marked off from their respective divisions. The eighth figure on the treadles is 2, which reverses the division D; therefore, all the spaces corresponding to this division must be marked two spaces upward, for here the weaver goes twice over these treadles; and so on, till the pattern be completed.

Now, it is evident, that by changing the succession of treading, other varieties will be produced; but, in many cases, it will be found more eligible to continue the same order of treading, and to vary the arrangement of the raising cords, as exemplified by the following plans, which have the same draught as the preceding.

No. 3. Fig. 6.

| | | | | | | | | |
|---|----|---|---|---|---|---|---|-----|
| | | 0 | 1 | 2 | 2 | 1 | | |
| | 0 | | 1 | 1 | 2 | 2 | 1 | 1 |
| | 0 | | 1 | 1 | 3 | 3 | 1 | 1 |
| 0 | | | 1 | 1 | 4 | 1 | 1 | 4c. |
| 1 | 1 | 1 | 1 | | | | | |
| | 1 | 1 | 1 | | | | | |
| 2 | 2 | 3 | 1 | | | | | |
| | 4c | 3 | 4 | | | | | |

No. 3.

FULL MOUNTING.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 0 | | | 0 | | | 0 | 0 | 0 | | | | |
| | 0 | | | 0 | | | 0 | | | 0 | 0 | | 0 | | |
| | | 0 | | | 0 | | | 0 | | | 0 | 0 | 0 | | |
| | | | 0 | | | 0 | | | 0 | | 0 | 0 | 0 | | |
| 0 | | | 0 | | | 0 | 0 | 0 | | 0 | | | | | |
| | 0 | | | 0 | | | 0 | 0 | | | 0 | | | | |
| | | 0 | | | 0 | | | 0 | 0 | | | 0 | | | |
| | | | 0 | | | 0 | 0 | 0 | | 0 | | | 0 | | |
| 0 | | | 0 | 0 | 0 | | 0 | | | 0 | | | | | |
| | 0 | | | 0 | | | 0 | | | | 0 | | | | |
| | | 0 | | | 0 | | | 0 | | | | 0 | | | |
| | | | 0 | | | 0 | 0 | 0 | | | 0 | | | | |
| 0 | 0 | 0 | | 0 | | | 0 | | | 0 | | | | | |
| | 0 | | 0 | | 0 | | | 0 | | | 0 | | | | |
| | | 0 | 0 | | 0 | | | | 0 | | | 0 | | | |
| | | | 0 | 0 | 0 | | | | 0 | | | | 0 | | |
| 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 |

No. 4. Fig. 7.

| | | | | | | | |
|---|---|---|---|----|-----|---|-------|
| | 0 | | | | 1 | 2 | 2 |
| 0 | | | | | 1 1 | 2 | 2 &c. |
| | | 0 | | | 1 | 1 | 3 3 |
| | | | 0 | | 1 | 1 | 4 |
| 1 | 1 | 1 | 1 | | | | |
| 2 | 2 | 1 | 1 | | | | |
| 2 | 2 | 3 | 4 | du | | | |
| 2 | 2 | 3 | | | | | |

No. 4.

FULL MOUNTING.

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | | 0 | 0 | 0 | | | 0 | | | 0 | | | 0 |
| | | 0 | | 0 | | 0 | 0 | | | 0 | | | 0 | | | 0 |
| | 0 | | | 0 | 0 | | 0 | | 0 | | | 0 | | | 0 | |
| 0 | | | 0 | 0 | 0 | | 0 | | | 0 | | | 0 | | | |
| | 0 | 0 | 0 | | | 0 | | | | 0 | | | 0 | | | 0 |
| | 0 | | 0 | 0 | | 0 | | | | 0 | | | 0 | | | 0 |
| | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | | | 0 | | |
| | 0 | 0 | 0 | | 0 | | | 0 | | | 0 | | | 0 | | |
| | | | 0 | | | 0 | | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| | | 0 | | | 0 | | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | | | 0 | | | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | | | 0 | | | 0 | | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | 0 | | | 0 | | 0 | 0 | 0 | 0 | | | 0 | | 0 |
| | | 0 | | | 0 | | 0 | | 0 | 0 | 0 | | | 0 | | 0 |
| | 0 | | | 0 | | | 0 | | 0 | 0 | 0 | | | 0 | | 0 |
| 0 | | | 0 | | | 0 | | 0 | 0 | 0 | 0 | | | 0 | | 0 |
| 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 | |

No. 5. Fig. 8.

| | | | | | | | | | | |
|---|---|---|---|-----|--|---|---|---|---|-----|
| | | | 0 | | | | 1 | 2 | 2 | |
| | | | 0 | | | | 1 | 1 | 2 | 2 |
| 0 | | | | | | | 1 | 1 | 3 | 3 |
| | 0 | | | | | | 1 | 1 | | 4c. |
| | | | | | | | | | | |
| 1 | | 1 | | 1 | | 1 | | | | |
| | 1 | | | 1 | | 1 | | | | |
| 2 | | 2 | | | | | | | | |
| | | | | 3 | | | | | | |
| | | | | 4 | | | | | | |
| | | | | 4c. | | | | | | |

No. 5.

FULL MOUNTING.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | | | 0 | 0 | 0 | 0 | | | 0 | |
| | 0 | | | 0 | | 0 | 0 | 0 | | 0 | | |
| 0 | | | 0 | | | 0 | 0 | 0 | | 0 | | |
| | | 0 | | | 0 | | | 0 | 0 | 0 | 0 | |
| | 0 | | | 0 | | | 0 | | 0 | 0 | 0 | |
| 0 | | | 0 | | | 0 | | | 0 | 0 | 0 | |
| | 0 | 0 | 0 | | | 0 | | | 0 | | | 0 |
| 0 | | 0 | 0 | | 0 | | | 0 | | | | 0 |
| 0 | 0 | 0 | 0 | | | 0 | | | 0 | | | |
| | | 0 | 0 | 0 | | | 0 | | | 0 | | |
| | 0 | | 0 | 0 | 0 | | | 0 | | | | 0 |
| 0 | | | 0 | 0 | 0 | | | | 0 | | | |
| 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 | |

In all these varieties, each set of treadles raises only one division of the tweceling leaves; but it is more frequent in weaving dornic and diaper to raise sometimes two, or more divisions, by the different sets of treadles, as will fully appear by looking over the collection of patterns subjoined to this chapter. The following plan of cording for the preceding draught, will suffice to show how any patterns of this kind may be extended on the full mounting; and which may be also varied in the same manner as the preceding example.

No. 6. Fig. 9.

| | | | | | | | |
|---|---|---|---|---|---|---|-------|
| | | 0 | 0 | | 1 | 2 | 2 &c. |
| 0 | | | 0 | | 1 | 1 | 2 2 |
| 0 | 0 | | | | 1 | 1 | 3 3 |
| | 0 | 0 | | | 1 | 1 | 4 |
| 1 | 1 | 1 | 1 | 1 | | | |
| 2 | 2 | 3 | 4 | 5 | | | &c. |

No. 7. FULL MOUNTING.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 |
| | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | |
| 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 |
| | 0 | 0 | 0 | | 0 | 0 | 0 | | | 0 | | | 0 | | |
| 0 | | 0 | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | | |
| 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | |
| 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | | | 0 | | | 0 | |
| | | | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | | 0 | |
| | | 0 | | 0 | | 0 | 0 | 0 | | 0 | 0 | | | 0 | |
| | 0 | | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | | | 0 | |
| 0 | | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | | | 0 | |
| | | | 0 | | | 0 | 0 | 0 | | | 0 | | | 0 | |
| | | 0 | | | 0 | | 0 | | 0 | 0 | | | 0 | | |
| 0 | | | 0 | | | 0 | 0 | 0 | | 0 | | | 0 | | |
| 0 | | | 0 | | | 0 | 0 | 0 | | 0 | | | 0 | | |
| 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 |

These examples are all confined to the four leafed regular tweel, for sake of convenience, as formerly noticed; but it is very easy to substitute any other tweel for this that may be desired, as will be evinced by the following example, which is pattern No. 3, Fig. 6, woven by a tweel of five leaves, commonly called the diaper tweel.

No. 8. Fig. 6.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | | | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | | | 0 | | | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0 | | | 0 | | | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | | | 0 | | | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | | | 0 | | | 0 | | | 0 | 0 | 0 | 0 | 0 |
| 0 | | | 0 | | | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | 0 | | | 0 | 0 | 0 | | 0 | | | 0 | | |
| 0 | | | 0 | 0 | 0 | 0 | | 0 | | | 0 | | | 0 | |
| | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | |
| | | | 0 | 0 | 0 | 0 | 0 | | 0 | | | 0 | | | 0 |
| | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 |
| 0 | | | 0 | | | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | | 0 | | | 0 | | | 0 | | | 0 | |
| 0 | 0 | 0 | 0 | | 0 | | | 0 | | | 0 | | | 0 | |
| 0 | 0 | 0 | 0 | | 0 | | | 0 | | | 0 | | | 0 | |
| 0 | 0 | 0 | 0 | | 0 | | | 0 | | | 0 | | | 0 | |
| 5 | 4 | 3 | 2 | 1 | 5 | 4 | 3 | 2 | 1 | 5 | 4 | 3 | 2 | 1 | 5 |

When a border is added to any of these patterns, either for table linen, or shawls, it is only necessary to vary the draught of the bord from that of the body; and when working the cross borders, the weaver follows the same order of treading as this part of the draught. Fig. 11 is a pattern of this kind, the cording plan of which is subjoined; the treading of the body and border being the same as their respective draughts.

DIAPER BORDER.

No. 9.

Fig. 11.

| | | | | BODY. | | | | | | BORD. | | | |
|---|---|---|---|-------|---|---|---|---|---|-------|---|---|---|
| | 0 | 0 | | 2 | 2 | 4 | 2 | 4 | 2 | 1 | 1 | 1 | 1 |
| | | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 0 | | | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 0 | 0 | | | 4 | 2 | 2 | 4 | 2 | 4 | 4 | 1 | 2 | 1 |

It has hitherto been understood that diaper patterns are always woven with treadles; but it will be obvious, that, when a five leafed tweel is employed, all the patterns of above three sets of leaves would require so many treadles as would render the operations of the weaver very difficult, if not impracticable. To obviate this difficulty, the mounting represented in Figs. 13 and 14, plate 1, has been invented; by which, with five treadles only, or what are requisite for one set of the tweel, any pattern to the extent of thirty-five leaves, or seven sets of a five leafed tweel, may be easily produced.

In Fig. 14, which is a front view of this mounting, C is the top castle or heddle bearer, D, the leaves of heddles, which, in this example, amount to 20, or four sets of the five leafed tweel. B, is a set of coupers, one for each leaf, to which it is connected by the cord *n*, and on which the raising cords are tied. There are no sinking cords in this mounting, as the warp lies on the race rod in the same man-

ner as in the mounting Fig. 8. The ends of these coupers, with their raising cords, are seen at B, Fig. 13. E, Fig. 14, is another set of coupers, equal in number to the former, and to which they are respectively connected, for the purpose of raising the opposite ends of the shafts by the cords, *w*.—1, 2, 3, 4, 5, are the ends of a set of upper treadles, or rather marches, one for each leaf of the tweel; a side view of which will be found at A, Fig. 13. Each of these levers is connected to a treadle below, by means of the cords *z*, which pass down through the warp, and are kept in a vertical position by the hole board *x*. *m* and *n* are weights which sink the shafts after they have been raised to form the sheds. The following plan will show how the coupers B, are connected to the levers A.

No. 10.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | | |
| 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | 0 | x | | 0 | 0 | 0 | 0 | x | | 0 | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | |
| 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | |
| 0 | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | | | |
| 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | | 0 | 0 | 0 | x | |

Here the crosses, or marks x, point out where the tight cords *i* are tied to the levers A, Fig. 13, and the ciphers denote slack cords which are tied to the small rings *a*; the blank squares denoting that no cords are necessary at these intersections of the coupers and top levers. Hence it will appear, that there is one couper of each set, connected to each lever A, by a tight cord, and one couper of each set that has no connexion whatever with these levers; and also, that there are three coupers of each set that are tied to the small rings *a*. From these rings, cords pass down through the levers A, and up through the box *g*, where they are tied to another set of levers, the ends of which appear at *e*. These levers are again connected to

another set *h*, to which the bobs or handles *l* are appended. Fig. 15 is a horizontal plan of the box *g*. On the cords by which the bobs are suspended, are knots, which, passing down through the board *k*, when the bobs are drawn, are prevented from returning, by being put into a narrow cut in the board, as represented at Fig. 16.

Now, if we suppose all the bobs to be disengaged from the board *k*, it is evident that, when any one of the treadles *a, e, i, o, u*, are pressed down, there will be only one couper of each set sunk, namely, that which is connected to the top levers *A*, by the tight cords; and, consequently, when the weaver works over the treadles *a, e, i, o, u*, a tweel will be produced of one thread raised and four sunk; for the coupers which are connected by the slack cords, and those which have no cords, will not be affected by the levers *A*.

Again, were all the bobs drawn down, and the knots fixed in the box *k*, it is obvious, that all the connecting cords would become tight; and, of course, when the under treadles were wrought over, all the coupers in the mounting would be sunk, and their respective leaves raised, except those which have no connexion with the levers *A*; and thus a tweel would be woven with four leaves raised and one sunk, which is the reverse of the other. Hence it will appear, that when any one or two of the bobs are pulled down, the sets of leaves with which they are connected will produce a tweel the reverse of those which are left; and by this means, any pattern, to the extent formerly mentioned, may be woven by this mounting. Thus, for example, were the pattern Fig. 9, to be woven by this mounting, and by a five leafed tweel: then, the cording on the coupers *B*, Fig. 13, plate 1, may be the same as in the preceding plan, No. 10; and the draught and cording, as in No. 6, binding plans. Now, as each of the bobs or handles 1, 2, 3, 4, Fig. 13, is connected to its respective division, and two

No. 24.

| | | | | | | |
|---|---|--|---------|-----------|---------|-------|
| 0 | | | 1 8 1 | | | 1 8 1 |
| 0 | 0 | | 3 1 1 3 | 1 3 3 1 | 3 1 1 3 | |
| | 0 | | 1 | 1 1 3 1 1 | | 1 |

No. 25.

| | | | | | |
|---|---|--|---------|-----------|-----|
| | 0 | | 1 1 | 4 4 | 1 1 |
| 0 | | | 1 1 1 3 | 1 3 1 1 1 | |
| 0 | | | 5 | 5 | 5 5 |

No. 26.

| | | | | | |
|---|---|--|-----------------|-----------------|-----------|
| | 0 | | 1 1 3 | 3 1 1 | 2 1 2 1 1 |
| 0 | 0 | | 1 1 1 3 1 1 3 | 1 1 1 3 1 1 1 1 | |
| 0 | 0 | | 1 1 2 1 2 1 1 2 | | 3 1 1 |

No. 27.

| | | | | | |
|---|---|--|---------|---------|---------|
| 0 | | | 1 1 1 | 2 1 1 2 | 1 1 1 1 |
| 0 | 0 | | 1 1 1 1 | 2 2 | 1 1 1 1 |
| 0 | 0 | | 2 1 1 | 2 1 2 | 1 1 2 |

No. 28.

| | | | | | |
|---|---|---|---------|---------|---|
| 0 | 0 | | 3 1 1 3 | 3 1 3 | |
| | 0 | 0 | 3 | 3 3 | 3 |
| | | 0 | 3 1 3 | 3 1 1 3 | |

PATTERNS FOR FOUR DIVISIONS.

No. 29.

| | | | | | |
|---|---|---|-------|-----------|-------|
| 0 | | | 1 3 3 | 1 1 | 3 3 1 |
| 0 | | | 1 1 1 | 1 1 | 1 1 1 |
| | 0 | | 1 1 | 1 1 1 1 | 1 1 |
| | | 0 | 1 1 | 3 3 1 3 3 | 1 1 |

No. 30.

| | | | | | | |
|---|---|---|-------|-------------|-------|-----------------|
| | | 0 | 1 4 1 | 1 4 1 | 1 4 1 | 1 4 1 |
| | 0 | | 2 2 | 2 2 | 2 2 | 2 2 |
| 0 | | | 1 1 | 1 1 4 1 1 | 1 1 | 2 1 2 2 1 2 1 1 |
| 0 | | | 1 1 | 2 1 2 2 1 2 | 1 1 | 1 1 4 1 1 1 1 |

No. 31.

| | | | | | |
|---|---|---|------------|-------------|----------|
| | | 0 | 11 1 212 | 212 1 11 22 | 22 11 1 |
| | 0 | | 2 1 1 22 | 22 11 2 212 | 212 2 11 |
| 0 | | | 1 1 1 313 | 1 1 1 3113 | 1 1 1 |
| 0 | | | 1 1 1 3113 | 1 1 1 313 | 1 1 1 |

No. 32.

| | | | | |
|---|---|---|-----------------------|-----------|
| 0 | | | 2 2 2 4 | 4 2 2 2 |
| 0 | 0 | | 1 1 1 3 | 3 1 1 1 1 |
| | 0 | 0 | 1 1 1 1 3 1 1 3 | 1 1 1 1 1 |
| | 0 | 0 | 1 1 1 1 3 2 3 1 1 1 1 | |

No. 33.

| | | | | |
|---|---|---|-------------|---------|
| | | 0 | 1 5 | 5 1 |
| | 0 | | 1 1 1 1 3 3 | 1 1 1 1 |
| | 0 | | 1 1 1 1 3 3 | 1 1 1 1 |
| 0 | | | 1 1 3 1 3 | 1 1 |

No. 34.

| | | | | |
|--|---|---|---------------------------------|-----------|
| | | | 5 5 5 | 5 |
| | 0 | | 1 1 3 3 1 2 1 2 | 1 1 |
| | 0 | 0 | 1 1 1 1 1 3 1 1 3 1 3 1 1 1 1 1 | |
| | 0 | 0 | 1 1 1 1 2 1 2 1 3 | 3 1 1 1 1 |

No. 35.

| | | | | |
|---|---|---|---------------------|-------------|
| | 0 | | 2 1 1 3 | 3 1 1 2 |
| | 0 | 0 | 1 1 1 1 3 | 3 1 1 1 1 1 |
| 0 | | | 1 1 1 1 1 1 2 3 2 1 | 1 1 1 1 1 |
| 0 | | | 1 1 2 1 3 1 1 1 3 | 1 2 1 1 |

No. 36.

| | | | | |
|---|---|---|-------------|---------|
| | 0 | | 1 2 1 2 | 2 1 2 1 |
| | 0 | 0 | 1 1 2 2 | 2 2 1 1 |
| 0 | | | 1 1 1 3 3 1 | 1 1 |
| 0 | | | 1 1 3 1 1 3 | 1 1 |

No. 37.

| | | | |
|---|---|---|-------------|
| | 0 | | 2 2 2 2 |
| | 0 | 0 | 2 1 2 2 1 2 |
| 0 | | | 2 2 2 2 |
| 0 | 0 | | 4 4 4 |

No. 45.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0 | 1 | 4 | 3 | 1 | 2 | 1 | 3 | 4 | 1 |
| 0 | 0 | 0 | 0 | 1 | 1 | 3 | 1 | 1 | 1 | 3 | 1 | 1 |
| 0 | 0 | | | 1 | 1 | 3 | 1 | 1 | 1 | 3 | 1 | 1 |
| 0 | 0 | | | 2 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | |

PATTERNS FOR FIVE DIVISIONS.

No. 46.

| | | | | | | | | | | | | |
|---|---|---|---|--|---|---|---|---|---|---|---|---|
| | | | | | 5 | 1 | 1 | 5 | | | | |
| 0 | 0 | 0 | | | 1 | 3 | 1 | 3 | 1 | | | |
| | 0 | 0 | 0 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | 0 | 0 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | 0 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

No. 47.

| | | | | | | | | | | | | |
|---|---|---|--|--|---|---|---|---|---|---|---|---|
| | | | | | 4 | | | 4 | | | | |
| 0 | 0 | 0 | | | 1 | 1 | 1 | 2 | 4 | 2 | 1 | 1 |
| | 0 | 0 | | | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| | | 0 | | | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 |
| 0 | | | | | 3 | 1 | 1 | 3 | 3 | 1 | 1 | 3 |

No. 48.

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| | | | 0 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| 0 | 0 | | | | 3 | 3 | | | 3 | 1 | 3 | | | | | | |
| | 0 | 0 | | | 3 | 3 | | | 3 | 3 | | | | | | | |
| | | 0 | | | 1 | 3 | 1 | 3 | 1 | 3 | 3 | 1 | | | | | |

No. 49.

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|--|---|---|--|--|--|
| | | 0 | 0 | 4 | | | 4 | | | 4 | | | | | | |
| | | | 0 | 2 | 2 | | | 2 | 2 | | | 2 | 2 | | | |
| 0 | 0 | | | 3 | 1 | 1 | 3 | 3 | 1 | 3 | | | | | | |
| | 0 | 0 | | | | | | | | | | | | | | |
| | | 0 | | | 3 | 1 | 3 | 3 | 1 | 3 | | | | | | |

No. 50.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 0 | | | | 0 | 1 | 2 | 2 | 2 | 2 | 1 | | |
| 0 | 0 | | | | 1 | 1 | 3 | 3 | 1 | 1 | 1 | |
| | 0 | 0 | | | 1 | 1 | 1 | 3 | 3 | 1 | 1 | 1 |
| | | 0 | 0 | | 1 | 1 | 1 | 1 | 6 | 1 | 1 | 1 |

No. 51.

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | | | | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | | | | |
| | | | | 0 | | | 2 | 2 | | | | 2 | 2 | | | | | |
| 0 | 0 | | | | 3 | 1 | 3 | | 1 | 1 | 1 | 1 | | 3 | 1 | 3 | | |
| | 0 | 0 | | | 3 | 3 | | 1 | 1 | 1 | 1 | 1 | | 3 | 3 | | | |
| | | 0 | | | 3 | 1 | 1 | 3 | | 1 | 1 | 1 | 1 | | 3 | 1 | 1 | 3 |

PATTERNS FOR SIX DIVISIONS.

No. 52.

| | | | | | | | | | | | | |
|---|---|---|---|---|--|--|---|---|---|---|---|---|
| | | | 0 | 0 | | | 1 | | 2 | | 2 | |
| | | | 0 | 0 | | | 1 | 1 | | 2 | 1 | 2 |
| | | 0 | 0 | | | | 1 | 1 | | 2 | 2 | |
| | 0 | 0 | | | | | 1 | 1 | 1 | 1 | | |
| 0 | 0 | | | | | | 1 | 1 | 1 | 1 | | |
| 0 | 0 | | | | | | 1 | 1 | | 1 | 1 | |

No. 52, CONTINUED.

| | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 2 | | 1 | | | | | |
| | | | | | | | 2 | 1 | 2 | | 1 | 1 | | | |
| | | | | | | | 2 | 2 | | 1 | 1 | | | | |
| | | | | | | | 2 | | 2 | 1 | 1 | 1 | 1 | | |
| | | | | | | | 2 | 1 | 1 | 2 | | 1 | 1 | 1 | 1 |
| | | | | | | | 2 | 1 | 2 | | 1 | 1 | 1 | 1 | |

No. 53.

| | | | | | | | | | | | | | |
|---|---|---|---|---|--|--|--|---|---|---|---|---|---|
| | | | | | | | | 2 | | 2 | | 2 | |
| 0 | 0 | | | | | | | 1 | | 1 | | 1 | |
| | 0 | 0 | 0 | | | | | 1 | 1 | | 1 | 1 | |
| | | 0 | 0 | | | | | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | 0 | 0 | | | | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | 8 | | | | 1 | | 1 | 1 | | 1 |

PATTERNS FOR SEVEN DIVISIONS.

No. 57.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 4 | 2 | 1 | 1 | 1 |
| | | | 0 | 0 | | 1 | 1 | | 2 | 2 | 2 | | 1 | 1 |
| | | | | | 0 | 1 | 1 | | 2 | 1 | 2 | 2 | 1 | 1 |
| 0 | 0 | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | | | | | | | 1 | 1 | | | | 1 | 1 |
| 0 | 0 | 0 | | | | | | 2 | 2 | | | | 2 | 2 |
| | | 0 | | | | | | 1 | 1 | | | | 1 | 1 |

No. 58.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|--|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 0 | | | | | 4 | | | | 4 | | |
| | | | | 0 | | | | | 2 | 2 | | | 2 | 2 | |
| 0 | 0 | 0 | 0 | | | 1 | 1 | 1 | | | 1 | 1 | 1 | 1 | |
| | 0 | 0 | 0 | | | 2 | 1 | 2 | 2 | 4 | 2 | 2 | 1 | 2 | |
| | | 0 | 0 | 0 | | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | |
| | | | 0 | 0 | | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 1 |
| | | | 0 | | | 1 | 1 | | 1 | 1 | 1 | | 1 | 1 | |

No. 59.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 0 | 0 | | | | 1 | 1 | | | 1 | 1 | |
| | | | | 0 | 0 | | | | 2 | 2 | | | 2 | 2 | |
| | | | | | 0 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | | | | | | 1 | | 1 | 1 | 1 | | 1 | 1 | 1 | 1 |
| 0 | 0 | | | | | 2 | | 2 | | 2 | 2 | | 2 | 2 | 2 |
| 0 | 0 | 0 | | | | 3 | 3 | | 3 | 3 | | 3 | 3 | | 3 |
| 0 | 0 | 0 | 0 | | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |

No. 60.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|--|---|---|--|
| | | | | 0 | 0 | 1 | | 1 | 1 | | | 1 | | |
| | | | | 0 | 0 | 1 | | 1 | 1 | | | 1 | | |
| | | | 0 | 0 | | 1 | | 1 | | 1 | | 1 | | |
| | | 0 | 0 | 0 | | 1 | | 1 | | 1 | | 1 | | |
| | 0 | | 0 | | | 1 | 1 | | 1 | 1 | | 1 | 1 | |
| 0 | | 0 | | | | 1 | 1 | | 1 | 1 | | 1 | 1 | |
| 0 | 0 | | | | | 1 | 1 | | 1 | 1 | | 1 | 1 | |

No. 60, CONTINUED.

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 1 | 3 | 1 | 1 | 1 | 1 |
| 3 | 1 | 1 | 3 | 1 | 1 | 1 |
| 3 | 1 | 1 | 3 | 1 | 1 | 1 |
| 3 | 3 | 1 | 1 | 1 | 1 | 1 |
| 3 | 3 | 1 | 1 | 1 | 1 | 1 |
| 3 | 3 | 1 | 1 | 1 | 1 | 1 |
| 3 | 3 | 1 | 1 | 1 | 1 | 1 |
| 3 | 3 | 1 | 1 | 1 | 1 | 1 |

No. 61.

| | | | | | | | | |
|---|---|---|---|--|---|---|---|---|
| | | | | | 1 | 3 | 1 | 3 |
| | | 0 | 0 | | | 3 | 3 | |
| | | | 0 | | | 3 | 3 | |
| 0 | 0 | 0 | | | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | | | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | | | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | | | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | | | 1 | 1 | 1 | 1 |

No. 61, CONTINUED.

| | | | | | | | | |
|--|--|--|--|--|---|---|---|---|
| | | | | | 3 | 1 | 3 | 1 |
| | | | | | 3 | 3 | | |
| | | | | | 3 | 3 | | |
| | | | | | 3 | 3 | 1 | 1 |
| | | | | | 3 | 3 | 1 | 1 |
| | | | | | 3 | 3 | 1 | 1 |
| | | | | | 3 | 3 | 1 | 1 |
| | | | | | 3 | 3 | 1 | 1 |

No. 62.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 2 | 1 |
| | | | | | | 0 | 1 | 1 | 2 | 2 | 1 |
| 0 | 0 | | | | | | 1 | 2 | 2 | 2 | 1 |
| 0 | 0 | | | | | | 1 | 1 | 1 | 1 | |
| 0 | 0 | 0 | | | | | 1 | 1 | 1 | 1 | |
| 0 | 0 | 0 | | | | | 1 | 1 | 1 | 1 | |

No. 65.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|--|--|--|--|---|---|---|---|---|---|
| | | | 0 | 0 | 0 | | | | | | 2 | 4 | | | |
| | | | | 0 | 0 | | | | | | 2 | 2 | | | |
| | | | | | 0 | | | | | | 2 | 1 | 2 | | |
| 0 | 0 | | | | | | | | | 2 | 4 | 2 | 1 | 1 | |
| 0 | 0 | 0 | | | | | | | | 2 | 2 | 2 | 2 | | |
| 0 | 0 | 0 | | | | | | | | 2 | 1 | 2 | 2 | 1 | 2 |
| | | | 0 | | | | | | | 1 | 1 | 1 | 1 | | |

No. 65, CONTINUED.

| | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|---|---|---|---|---|---|
| | | | | | | | | | | | 2 | | | | |
| | | | | | | | | | | 2 | 2 | | | | |
| | | | | | | | | | | 2 | 1 | 2 | | | |
| | | | | | | | | | | 1 | 1 | 2 | 4 | 2 | |
| | | | | | | | | | | 2 | 2 | 2 | 2 | | |
| | | | | | | | | | | 2 | 1 | 2 | 2 | 1 | 2 |
| | | | | | | | | | | 1 | 1 | 1 | 1 | | |

No. 66.

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|--|--|--|--|--|---|---|---|---|---|---|---|---|---|
| | | | 0 | 0 | 0 | | | | | | 3 | 3 | 3 | 3 | | | | | |
| | | | | 0 | 0 | | | | | | 3 | 1 | 1 | 3 | | | | | |
| | | | | | 0 | | | | | | 1 | 2 | 1 | 2 | 1 | | | | |
| 0 | 0 | 0 | | | | | | | | | | | | 1 | 2 | 1 | | | |
| 0 | 0 | 0 | | | | | | | | | | | 1 | 1 | 3 | 1 | 1 | 3 | 1 |
| | | | 0 | | | | | | | | | | 1 | 1 | 3 | | 3 | 1 | |
| | | | 0 | | | | | | | | | | 2 | 1 | 3 | | 3 | 1 | |

No. 66, CONTINUED.

| | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 3 | 3 | 3 | 3 | | | | |
| | | | | | | | | | | | 3 | 1 | 1 | 3 | | | | |
| | | | | | | | | | | | 1 | 2 | 1 | 2 | 1 | | | |
| | | | | | | | | | | | 1 | 2 | 1 | | | | | |
| | | | | | | | | | | 1 | 1 | 1 | 3 | 1 | 1 | 3 | 1 | 1 |
| | | | | | | | | | | 1 | 1 | 1 | 3 | | 3 | 1 | 1 | |
| | | | | | | | | | | 2 | 1 | 3 | | 3 | 1 | 2 | | |

CHAP. V.

DOUBLE CLOTH.

THIS is one branch of fancy weaving, which has hitherto lent but little aid towards the extension of the cotton or silk manufacture; having been almost exclusively confined to the manufacture of carpets and quiltings. There seems, however, little room to doubt, were this branch of weaving more generally known among our manufacturers, that it might be applied, with considerable advantage, in the fabrication of various species of cotton and silk goods; especially of such as are in request for warmth and durability.

Double cloth is, for the most part, composed of two similar fabrics, generally plain, which are interwoven at various intervals, and formed into a diversity of figures, agreeably to the design of the pattern to be produced. This is the method usually pursued in carpet weaving. Sometimes one of the fabrics is superior in quality to the other, as in quiltings; in which the superior fabric is called the face, and the inferior, the back. It will therefore be necessary, in explaining the principles of this branch of weaving, to take these two methods separately into consideration: and, in discussing the former, the reader would do well to keep in view the plans and descriptions of diaper weaving, given in the last chapter, to which the mountings and processes of weaving double cloth bear a strong analogy.

SECT. I.

DOUBLE CLOTH BY THE JUNCTION OF TWO EQUAL FABRICS.

In order to render this species of weaving as perspicuous as possible, let us take, for example, the warp of any plain fabric, one thread of which is blue, and the other white, alternately, and let us suppose this warp to be drawn through a common four leafed set of plain heddles, in the usual way. Then it will appear from the following plan, that, when the draught commences with a blue thread, all the other blue threads will be drawn on the two back leaves at 3, 5, 7, &c. and all the white threads, as numbered 2, 4, 6, &c. will be drawn on the two front ones: and, farther, that by the proper application of a pair of treadles, this mounting will produce the following varieties:—

First, When the two back leaves are raised and sunk alternately with the two fore ones, and white weft thrown across, the whole fabric, which is plain cloth, will be formed into very small blue and white stripes: and if a shot of blue and a shot of white be thrown in alternately, a corresponding check will be produced. These sheds will be opened by the two treadles marked A.

Secondly, If the two fore leaves were constantly sunk, and the back leaves raised alternately, it is plain, that, by throwing in blue weft, all the blue warp would be woven into a uniformly blue fabric, leaving all the white warp unwoven below. This would be the effect of the two treadles marked B.

Thirdly, And, were the two back leaves constantly raised, and the two front leaves raised alternately, a white fabric would be produced, by throwing across white weft, leaving out the blue warp, above. See the treadles marked C.

Fourthly, All the blue warp is sunk, and white cloth woven, by the treadles D; and

Fifthly, The white warp is all raised, and blue cloth produced by the treadles E.

No. 1.

| | | | | | | | | | | | | | | | |
|---|----|--|----|---|----|---|----|--|----|---|---|---|----|---|--------|
| | 0 | | 0 | | 0 | 0 | | | | | 0 | | 5 | 1 | Blue. |
| | 0 | | 0 | | 0 | 0 | | | | | 0 | | 7 | 3 | Blue. |
| | 0 | | | | | 0 | | | 0 | | 0 | 0 | 6 | 2 | White. |
| | 0 | | | | | 0 | | | 0 | | 0 | 0 | 8 | 4 | White. |
| 1 | 2 | | 3 | 4 | | 5 | 6 | | 7 | 8 | | 9 | 10 | | |
| | A. | | B. | | C. | | D. | | E. | | | | | | |

By consulting this small scheme, it will be manifest, that each of these webs may be woven separately and distinctly from the other, either when the white or the blue warp is uppermost; but the manner in which they are woven together, and made to pass through each other, at pleasure, will appear from the following plans:—

No. 2.
White
above.

No. 3.
Blue
above.

| | | | | | | | | | | | | | | | |
|---|-------------|------------|------------|---|--|---|---|--|-------------|------------|-------------|------------|--|--|--------|
| | | | 0 | | | 1 | 1 | | 0 | | 0 | 0 | | | Blue. |
| | | 0 | | | | 3 | 3 | | 0 | 0 | 0 | | | | Blue. |
| | | 0 | 0 | 0 | | 2 | 2 | | | | 0 | | | | White. |
| | | 0 | 0 | 0 | | 4 | 4 | | 0 | | | | | | White. |
| 7 | 9 | 8 | 10 | | | | | | 5 | 3 | 6 | 4 | | | |
| | 2d. | 1st. | 1st. | | | | | | 2d. | 2d. | 1st. | 1st. | | | |
| | White Shot. | Blue Shot. | Blue Shot. | | | | | | White Shot. | Blue Shot. | White Shot. | Blue Shot. | | | |

If this plan be examined with attention, it will be found, that, in No. 2, where the white warp is above, when the treadle marked 10 is pressed down, one blue leaf is raised and the other sunk, while all the white warp is raised above the shuttle; and therefore, one shot of blue weft is thrown into this shed, to form the blue fabric. When the treadle

8 is pressed down, it raises one white leaf and sinks the other; while, at the same time, all the blue warp is sunk quite clear of the shuttle: into this shed the first white shot is thrown. The treadle marked 9 reverses the blue shed, keeping the white warp still above; into this shed the second blue shot is thrown: and the treadle 7 sinks all the blue warp, and reverses the white shed for the second white shot. The numbers on these treadles refer to those on the plan No. 1.

By following this process, the two webs would be woven quite distinct from each other, the white web above the blue one; but when the set of treadles at No. 3 are employed, the two webs will change places, and the blue web will now be above, as will appear by comparing the raising marks upon the treadle plans. Hence, if one shuttle only were employed for both webs, so long as the weaver continued to work upon one set of treadles, the two webs would still be distinct except at the selvages, where they would be united by the weft. After this manner are the hempen pipes woven, which have been lately adapted in France, to the fire engine; likewise the wicks for the patent lamps, &c.*

Plaits or folds are sometimes woven in the loom upon the ends of muslin plaids, or the borders of garments, as part of their ornament. This is effected by working, on a pair of treadles, about a half, three-fourths, or a whole inch,

* The weaving of double cloth may be applied to many other useful purposes, as well as to articles of curiosity. It was on the principle of double cloth that Mr. DAVID ANDERSON, Damask Manufacturer, Glasgow, lately wove a shirt with a fine frill, double stitched neck, shoulder straps, and wrist bands; also gussets, buttons, button holes, &c. with the Royal Arms emblazoned on the breast. The whole of this production was executed entirely in the loom, without the smallest aid of needle-work. This shirt was presented to His Majesty George IV. who was graciously pleased to express his high satisfaction with the ingenuity of this performance, and through the Right Hon. Lord Sidmouth, His Majesty's Secretary of State, remitted Mr. Anderson £50. Another specimen of Mr. ANDERSON'S ingenuity in this line is deposited in the Hunterian Museum, Glasgow.

according to the size of the plait; the treadle being corded in the same manner as any of the sets B, C, D, or E, in No. 1: and this small piece, which contains only half of the warp, is drawn forward by the reed to the face of the original cloth, each half of the warp being on a separate roll. Sometimes both portions of the warp are woven separately in this manner, for a small space, and a number of ends of coarse yarn thrown in between them, forming a fine bold cord, covered on both sides with the cloth. The treadles either of No. 2 or No. 3 would produce this effect.

If the treadles No. 2 are wrought over a certain number of times, throwing in blue and white weft alternately, and the treadles No. 3, as often, blue and white stripes will be produced, running across the web; but, when the two warps are to be raised, so as to form checkers or alternate squares, another set of leaves must be added, and a certain portion of the warp drawn upon one set, and an equal portion on the other, alternately; and these portions, on each set, must be drawn in the very same order as in the preceding plan. The annexed scheme will make this plain.

No. 4. Fig. 1. Plate 4.

| White above. | | | | Blue above. | | | | | | | | |
|----------------|---|---|---|-----------------|---|---|---|---|---|---|---|-----------|
| | | 0 | 0 | | 0 | 0 | | | | 5 | 1 | Blue. |
| | 0 | | | 0 | 0 | | | | | 7 | 3 | Blue. |
| | 0 | 0 | | | 0 | | | | | 6 | 2 | White. A. |
| 0 | 0 | | | 0 | 0 | | | | | 8 | 4 | White. |
| 0 | | 0 | | | | 0 | | | | 5 | 1 | Blue. |
| 0 | 0 | 0 | | | 0 | | | | | 7 | 3 | Blue. B. |
| | | 0 | | | 0 | 0 | | | | 6 | 2 | White. |
| 0 | | | | 0 | 0 | | | 8 | 4 | | | White. |
| 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 | | | | | |
| Blue above. A. | | | | White above. B. | | | | | | | | |

In this plan we see that a portion of the two warps is drawn jointly on the back set of heddles marked A, and

another portion on the front set B, alternately, agreeably to the intended size of the checkers: and farther, that the raising cords are so disposed, that, when the set of treadles A, is wrought over any number of times, according to the number of draughts in each checker, the leaves at A will produce a square of double cloth with the white above, and the leaves B will produce another square with the blue above: and also, that when the treadles at B are wrought over, in the same manner, the leaves A will throw the blue cloth above, and the leaves B, the white above; and thus the checker pattern is produced by double cloth.

If these examples are compared with those of the reversed tweeling, the similarity which subsists between these two branches of weaving will become apparent; and by reverting also to the instructions and examples laid down in the preceding chapter, it will be easy to perceive, that, with a little attention to the arrangement of the raising cords, all that boundless variety of pattern which is woven on diaper, may also be produced by double cloth: for it is merely substituting one set of double cloth leaves, with its respective treadles and cording, in the latter, for each set of the tweeling apparatus in the former. And hence it will be obvious, that all patterns woven by two divisions, or sets, such as Fig. 1, 2, 3, 4, Plate 4, will have their cordings the very same as in No. 4; the diversity of figure arising solely from the succession of the draught and treading, and therefore can require no further explanation. It will be proper, however, to insert one example, to show how diaper, or any other patterns which require a greater number of divisions, may be adapted to double cloth, and for this purpose, let the binding plan of No. 6 be resumed, with the cording of Fig. 9.

No. 5. Fig. 9.

| | | | | | | | | | | | | | | |
|-------------|----------|----------|----------|---|---|---|---|---|---|---|---|---|----------|----------|
| | | 0 | 0 | | 1 | 2 | 2 | 1 | 3 | 3 | 1 | 2 | <i>d</i> | |
| 0 | | | 0 | | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | <i>c</i> |
| 0 | 0 | | | | 1 | 1 | 3 | 3 | 1 | 1 | 1 | 1 | | <i>b</i> |
| | 0 | 0 | | | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | | <i>a</i> |
| | 1 | 1 | 1 | 1 | | | | | | | | | | |
| | 2 | 2 | 3 | 4 | | | | | | | | | | |
| | 2 | 2 | 3 | 4 | | | | | | | | | | |
| <i>g.c.</i> | 1 | 1 | 1 | 1 | | | | | | | | | | |
| <i>a</i> | <i>b</i> | <i>c</i> | <i>d</i> | | | | | | | | | | | |

Now, the full mounting for this pattern upon the double cloth principle will be as follows ; in which, the better to distinguish the two webs, the raising marks of the blue warp are denoted by B, and those of the white warp, by *w*.

In this plan, the draught is the same as in the diaper mounting; with this exception only, that in the diaper, each straight line over the leaves of the different divisions, represents the warp threads as drawn straight over these leaves, whereas, in this, they are drawn in the order of the figures, 1, 2, 3, 4, as at *x*.

It is farther to be observed, that, by following the succession of treading marked on the binding or general plan, No. 5, the weaver works once over the set of treadles marked D, by which all the white warp on the divisions A and B will be woven above, and all the white warp on the divisions C and D will be woven below, raising the blue cloth to form the figure, and this is effected by throwing in a blue shot on the treadle 1, a white one on the treadle 2, a blue one on the treadle 3, and a white one on the treadle 4. He then works once over the treadles C, once over B, once over A, once over B, once over C, and once over D, all in the same manner as at first; after which he continues to work twice over the treadles A, twice over B, three times over C, and four times over D; and so forth, agreeably to the succession of the draught; all which, it is presumed, will be plain from an attentive perusal of the plan. It may be further observed, that by applying the raising cords as in the diaper examples, No. 3, 4, 5, and 6, the corresponding figures 5, 6, 7, 8, plate 4, will be produced, in all of which, the shaded parts of the figures show where the blue cloth is raised above the white, to form the pattern.

In this manner, patterns may be woven in great variety, and might be applied with good effect, in the manufacturing of shawls, bed covers, and other fabrics, in which durability and a display of colours are desirable qualities.

SECT. II. OF THE JUNCTION OF TWO UNEQUAL FABRICS.

This species of double cloth is chiefly confined to the fabrication of quiltings, or Marseilles, which are manufactured in considerable quantities in England, and printed for vest pieces.

The mounting of a quilt consists of a set of plain heddles, usually four, for the face, and a number of stitching leaves, proportionate to the range of the pattern, for the back; and these produce all the variety of figure in the design. The stitching leaves are frequently adapted to diagonal and diamond patterns, although they may be made to produce any other fanciful figures, at pleasure; and the range of pattern, as in other branches of fancy weaving, may be enlarged beyond the power of leaves, or until the application of a harness becomes necessary.

Quiltings are generally woven in reeds of the Manchester and Bolton count, which contain a certain number of beers, or porters, in $24\frac{1}{4}$ inches. The warp and weft of the face are considerably finer than those of the back; and two threads of the face and one of the back are drawn into the same interval of the reed. If we take, for example, a No. 36 reed, that is, 36 beers on $24\frac{1}{4}$ inches, the warps and wefts, as noted below, will make a pretty good quilt, or Marseille.

| | | | |
|---------------------|--------|---|--------|
| For the face, _____ | No. 36 | } | warps. |
| For the back, _____ | 26 | | |
| Face, _____ | No. 46 | } | wefts. |
| Back, _____ | 36 | | |

In weaving these fabrics, there are two shots of the fine, and two of the coarse weft thrown in alternately. One shot of the fine stitches the back and face together, and one shot

No. 11. DIAMOND QUILT WITH FOUR FACE LEAVES.

| | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|---|---|----|----|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 7 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 10 | 4 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 8 | 2 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 11 | 5 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 9 | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 6 | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 8 | 2 | 4 | | 11 | 9 | 7 | 5 | 3 | 1 | | | | |
| 16 | 6 | 12 | 13 | | | | | | | | | | |
| 24 | 10 | 20 | | 15 | 17 | 19 | 21 | 23 | | | | | |
| | 14 | | | | | | | | | | | | |
| | 18 | | | | | | | | | | | | |
| | 22 | | | | | | | | | | | | |

To prevent the repetition of the wadding treadle, a stick, moving on its centre at the left is sometimes laid across, a little above the stitching treadles, and connected to the wadding treadle, which is placed at the right. As the weaver works along the stitching treadles, whenever he has occasion to sink the wadding one, he has only to shift back his heel on this stick, and press down the treadle, without moving his foot either to the right or left.

SECT. III. OF TWEELING DOUBLE CLOTH.

Although tweeling, however extensively it may be otherwise employed, is seldom applied to double cloth, yet, as there is great room here for a display of ingenuity, especially in the manufacture of shawls, plaids, bedcovers, &c. it will be necessary to show how the several varieties of this kind of texture may be produced.

It has been already observed, that four leaves, two for each set, are required to weave double cloth of the plain texture. If, therefore, one set of tweeling leaves be substituted for each set of the plain ones, it will be obvious, that

every variety of pattern that can be produced on the plain texture, can likewise be effected on tweeling. The following plan is for the three leafed tweel.

No. 12.

| | | | | | | | | | |
|---|---|---|---|---|---|--|--|---|----------|
| 0 | | 0 | | 0 | 0 | | | 1 | <i>w</i> |
| 0 | | 0 | 0 | 0 | 0 | | | 3 | <i>w</i> |
| 0 | 0 | 0 | | 0 | | | | 5 | <i>w</i> |
| 0 | | 0 | | | | | | 2 | <i>b</i> |
| 0 | | | | 0 | | | | 4 | <i>b</i> |
| | | 0 | | 0 | | | | 6 | <i>b</i> |
| 6 | 5 | 4 | 3 | 2 | 1 | | | | |

Suppose the warp on the three leaves marked *w* to be white, and that on the three marked *b* to be black; then white weft thrown in on the three treadles 1, 3, 5; and black on 2, 4, 6, will make the white cloth above and the black below: and if these two webs be made to pass through each other at different intervals, patterns may be produced in the same manner as explained in section 1st.

This mounting makes the one web pure black and the other pure white; but if the two colours of weft be different from the warp, then we may throw the greater proportion of either one or both warps outward, or of one or both warps inward; and thus a variety of colours may be displayed, in a manner that at present is not very common. As it would require, however, a great number of leaves and treadles to weave but a very limited pattern on this principle, even with the economical plans of the diaper, this style seems to be peculiarly adapted to the draw loom; under which head the subject of tweeling double cloth will be farther illustrated. In the meantime it may be of use to insert a few plans, to show how these various changes may be effected on a uniform ground. Suppose, therefore, the warp of one web to be purple, and of the other, green; and that they are to be

No. 16.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|--|---|------|
| 0 | 0 | 0 | | | | | | | | 1 | Pur. |
| 0 | 0 | | | | | | | | | 3 | Pur. |
| 0 | | | 0 | | 0 | | | | | 5 | Pur. |
| | | 0 | | 0 | | | | | | 7 | Pur. |
| 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | | 2 | Gr. |
| 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | | 4 | Gr. |
| 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | | 6 | Gr. |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 8 | Gr. |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | | | | |

Yellow weft shows above.
Green warp shows above.

The weft of Nos. 14, 15, and 16, is inserted in the same order as in No. 13. It will also be found by examining the cording of No. 13, that three-fourths of the red weft will be flushed over the green warp on the upper side of the cloth; and, also, that three-fourths of the yellow weft is below the purple warp on the under side: so that the greatest portion of each weft will be displayed on the surfaces of the cloth, while the two warps will be nearly concealed in the centre. In No. 14, this order is reversed, and the two warps appear to most advantage: and so of the other examples.

Double cloth is also woven for the purpose of making pillow cases, to avoid the seams at the selvages; a plan of the mounting of which is as follows:—

No. 17.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|--|--|---|
| 0 | 0 | | | | | | | | | | 1 |
| | 0 | 0 | | | | | | | | | 3 |
| | | 0 | 0 | | | | | | | | 5 |
| 0 | | | 0 | | | | | | | | 7 |
| 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 2 |
| 0 | 0 | 0 | 0 | 0 | | | | 0 | | | 4 |
| 0 | 0 | 0 | 0 | | | | 0 | 0 | | | 6 |
| 0 | 0 | 0 | 0 | | | 0 | 0 | | | | 8 |
| 8 | 6 | 4 | 2 | 7 | 5 | 3 | 1 | | | | |

All that is to be observed in this mounting is, that the tweel of one web may run in the contrary direction from the other, so that no interruption may appear at the selvages. Were this not the case, the tweel at each selvage would resemble what is usually termed the herring bone.

Nearly allied to double cloth, is a kind of tweel which shows two different colours of weft on the cloth, one on each side, and which are chiefly employed in the manufacture of silk stuffs. The two following plans are examples of this species of tweeling :--

No. 18.

| | | | | | | |
|------------|-------------|------------|-------------|------------|-------------|---|
| 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 6 | 5 | 4 | 3 | 2 | 1 | |
| Blue Shot. | White Shot. | Blue Shot. | White Shot. | Blue Shot. | White Shot. | |

No. 19.

| | | | | | | | |
|-------|--------|-------|--------|-------|--------|-------|--------|
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| Blue. | White. | Blue. | White. | Blue. | White. | Blue. | White. |

In No. 18, which may be called a three leafed double tweel, the white weft will appear to most advantage on the upper side of the cloth, while in the loom. The same is to be understood of No. 19, which is a four leafed double tweel.

On this principle many of the goods manufactured at Spittalfields are woven; and also a fabric which is an imi-

tation of what are called Angola shawls. These shawls have their warps of strong cotton yarn, generally double, and twisted, or what is called net warp, and the weft is sometimes cotton rove, and sometimes woollen, one half white and the other gray; a shot of each colour being thrown in alternately as in No. 19: the four leaved tweel being commonly employed for this purpose. When the fibres of the rove are raised in the process of dressing, they form a fine long shag, somewhat resembling felt. This plan, however, can only produce a plain fabric, of two different colours, one on each side: but when figures are formed on these shawls, agreeably to any particular pattern, recourse must be had to the draw loom, when they take the name of double dumb flowers, or double damask, under which head they will be farther explained.

If the rove is to appear on one side only, the other side may be woven plain, and common weft thrown in. This will be effected by the annexed plan of mounting.

No. 20.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0 | | | 0 | | 1 | 1 |
| 0 | | | | 0 | | 2 | 2 |
| | 0 | | 0 | | | 3 | 3 |
| 0 | | 0 | | | | 4 | 4 |
| 4 | 2 | 7 | 5 | 3 | 1 | | |
| 8 | c | | | | | | |

CHAP. VI.

THE MANUFACTURE OF CORDUROYS, VELVETS,
THICKSETS, &c.

As this branch of manufacture has never been carried to any great extent in Scotland, where, consequently, it can be but little known, some account of the several processes which are employed to bring these goods from the yarn to the finished state, will not, perhaps, be uninteresting to the intelligent reader.

The setts of reed in which corduroys, velvets, velveteens, &c. are generally woven, are Nos. 32, 34, 36, and 38: that is, 32, &c. beers, of 19 dents or splits each in $24\frac{1}{2}$ inches. It is usual, however, to fill only about 33 beers, of 19 dents, of a 34 reed, and about 35 beers of the 38 reed, for corduroys; but velveteens have from one beer upwards more than cords, on account of being more liable to shrink by the breadth, in the subsequent processes.

The web, or piece, is generally warped about 58 yards in length; and, when finished, will stand about 56, or $56\frac{1}{2}$ yards. The warp of a 34 reed, for example, is No. 32 mule yarn, doubled and well twisted; and two of these double ends make a splitful or dent. The weft, which is about No. 22 or 24, is thrown in single. There is a kind of cotton velvet, for ladies' pelisses or mantles, which is woven in No. 50 reed, or 50 beers in $28\frac{1}{2}$ inches; the warp of which is No. 52 doubled, and weft No. 52 single.

These warps are all well dressed, and dried by running a hot iron over them, before they are put into the loom. The weaver is not paid by the ell, or yard, as in other branches of weaving, but by the quantity of weft he throws into the

web. For example, weft about No. 24 is generally paid 21d. per pound, weaving and winding.

In these, as in some of the other species of fancy weaving, considerable ingenuity is displayed in the production of patterns, which, in general, exhibit a variety of flushing peculiar to themselves. This will be obvious from a perusal of the specimens subjoined to these descriptions. The ground, or back, as it is generally termed, is sometimes plain and sometimes tweeled. In the former case it is called a tabby or plain back, and in the latter, a jean or Genoa back; and the jeans are single or double, according as they are woven in a three or four leafed tweel mounting. The flushing, which is afterwards cut up to form the ridges, is thrown in, and interwoven with the ground at various intervals; and upon this depends all that diversity of pattern which we see in these fabrics. A few examples will illustrate these observations.

A PLAIN, OR TABBY BACK VELVET.

No. 1.

| | | | | | | | | | | |
|---|---|---|---|---|--|--|--|--|---|---|
| | | | | 0 | | | | | 3 | 1 |
| | | 0 | | 0 | | | | | 5 | |
| 0 | 0 | | 0 | | | | | | | 2 |
| | 0 | | | | | | | | 6 | 4 |
| 6 | 4 | 2 | 3 | 1 | | | | | | |
| | | 5 | | | | | | | | |

If we examine this plan, we will find that the treadle marked 1, or the first in the order of treading, will raise all the odd threads, 1, 3, 5, in the draught, and the treadle marked 4 will raise all the even ones: consequently, these two treadles, wrought alternately, will produce plain cloth; or, in other words, they will work the ground or back. The other three treadles are for the flushing. By tracing over the treading it will be found, that there are two shots of the

flushing thrown in for each shot of the ground, which are marked 2, 3, 5, 6, in the succession of treading; the treadle 6, being the same as 3, is added merely to keep the treads alternate, when both feet are employed on the treadles.

The following plan is an example of a

SINGLE JEAN BACK VELVET CORD.

No. 2.

| | | | | | | | |
|----|----|----|----|----|---|--|---|
| | 0 | | | 0 | | | 1 |
| | | | | 0 | 0 | | 2 |
| | 0 | 0 | | | 0 | | 3 |
| 0 | 0 | | 0 | 0 | | | 4 |
| | | | | 0 | 0 | | 5 |
| | 0 | | | | 0 | | 6 |
| 8 | 6 | 4 | 2 | 3 | 1 | | |
| 12 | 14 | 7 | 5 | 11 | 9 | | |
| | | 10 | 15 | | | | |
| | | 13 | | | | | |
| | | 16 | | | | | |

In this plan, the treadles on which the figures 1, 3, and 6, are marked, are for weaving the back, it being the single jean, or three leafed tweel: but as each shot of the flushing weft floats over five threads of warp, and is only interwoven with the sixth, two sets of tweeling leaves are necessary, in order to extend the draught to that range. In the present example we also find, that there are ten shots of flushing weft thrown in for six of the back; and these ten shots are interwoven with the warp threads 3 and 4 in the draught, and the flushed space afterwards cut up by the plough.

The following example shows how the draught and cording of a three leafed tweel are distributed on four leaves; the ground treadles being 1, 3, and 6.

GENOA BACK VELVET.

No. 3.

| | | | | | | | | | |
|----|----|----|----|----|---|--|--|---|---|
| | 0 | | | 0 | | | | 4 | 1 |
| | 0 | | | | | | | 5 | 2 |
| 0 | | | 0 | 0 | 0 | | | 6 | |
| | | 0 | | 0 | 0 | | | | 3 |
| 8 | 6 | 4 | 2 | 3 | 1 | | | | |
| 12 | 14 | 7 | 5 | 11 | 9 | | | | |
| | | 10 | 15 | | | | | | |
| | | 13 | | | | | | | |
| | | 16 | | | | | | | |

A four leafed tweel adapted to six leaves.

DOUBLE JEAN CORD.

No. 4.

| | | | | | | | | | |
|---|---|---|---|---|---|--|--|---|---|
| 0 | 0 | | | | | | | | 1 |
| 0 | | | 0 | | | | | | 2 |
| | | 0 | 0 | | | | | 7 | 3 |
| | 0 | 0 | | | | | | 8 | 4 |
| 0 | 0 | | | 0 | | | | | 5 |
| 0 | | | 0 | 0 | | | | | 6 |
| 2 | 4 | 6 | 8 | 3 | 1 | | | | |
| | | | | 7 | 5 | | | | |

In this plan of corduroy, it will be observed, that there are eight threads of warp, or two sets of a four leafed tweel drawn upon six leaves, to which the cording on the treadles 2, 4, 6, 8, will be found to correspond. Out of these eight threads, only the two, numbered 5 and 6, are interwoven with the flushing, leaving six for the furrow. Now these two threads, 5 and 6, form the base or centre of the ridge, after the flushing is cut on each side, and raised by the process described farther on.

From these, and the following collection of patterns, considered the best of their kinds in present use, the reader will

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be enabled to form some idea of the methods by which the varieties in this branch of weaving are produced, to pursue which any farther, in this manner, would only be losing time, as the most complex pattern in this collection, may be analyzed, by tracing the ground and flushing separately.

FOUR PATTERNS OF THICKSET CORDS, TABBY BACK.

No. 5.

No. 6.

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|--|--|--|----|---|---|---|---|---|---|---|---|---|--|---|---|---|
| | | | | 0 | | | | | 5 | 3 | 1 | 0 | | | 0 | 0 | | | 3 | 1 | |
| | 0 | 0 | | | | | | | | | 4 | 2 | | | | | 0 | | | 5 | |
| 0 | | | 0 | 0 | | | | | 9 | 7 | | | | 0 | | | | | | 2 | |
| | 0 | | | | | | | 10 | 8 | 6 | | | | 0 | 0 | | | | | 6 | 4 |
| 6 | 4 | 2 | 3 | 1 | | | | | | | | | 6 | 4 | 2 | 3 | 1 | | | | |
| | | | | | | | | | | | | | | | | 5 | | | | | |

No. 7.

No. 8

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|--|--|--|--|---|---|---|---|---|---|---|---|---|--|--|----|---|---|
| 0 | | | | | | | | | 8 | | | | 0 | | 0 | 0 | | | | 5 | 3 | 1 |
| 0 | | 0 | | | | | | | | 6 | 4 | | | 0 | | | | | | | 4 | 2 |
| | | | 0 | | | | | | | 5 | 2 | | | | | | 0 | | | 9 | 7 | |
| | 0 | | 0 | 0 | | | | | 7 | | 3 | 1 | | 0 | 0 | | | | | 10 | 8 | 6 |
| 6 | 4 | 2 | 3 | 1 | | | | | | | | | 6 | 4 | 2 | 3 | 1 | | | | | |
| | | | | | | | | | | | | | | | | 5 | | | | | | |

VELVET.

VELVET.

No. 9.

No. 10.

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|--|--|--|--|---|---|---|--|---|---|---|---|---|--|--|--|----|---|---|
| | 0 | 0 | | | | | | | | | | | 0 | | | | | | | | 5 | 3 | 1 |
| | | | | 0 | | | | | | | | | | 0 | 0 | | | | | | 9 | 7 | |
| | 0 | | | | | | | | | 5 | 3 | | 0 | | | 0 | 0 | | | | 4 | 2 | |
| 0 | | | 0 | 0 | | | | | 6 | | | | | | | 0 | | | | | 10 | 8 | 6 |
| 6 | 4 | 2 | 3 | 1 | | | | | | | | | 6 | 4 | 2 | 3 | 1 | | | | | | |
| | | | | | | | | | | | | | | | | 5 | | | | | | | |

FOUR JEAN BACK THICKSETS.

No. 11.

No. 12.

| | | | | | | | | | | | | | | |
|----|----|----|----|----|---|--|---|--|----|----|----|---|---|---|
| | 0 | 0 | | 0 | | | 1 | | | | 0 | 0 | | 1 |
| | | | | 0 | 0 | | 2 | | | | 0 | 0 | | 2 |
| | 0 | 0 | | | 0 | | 3 | | 0 | | 0 | 0 | | 3 |
| | 0 | 0 | 0 | 0 | | | 4 | | | 0 | 0 | 0 | | 4 |
| | | | | 0 | 0 | | 5 | | 0 | | 0 | 0 | | 5 |
| | 0 | 0 | | 0 | | | 6 | | | 0 | 0 | | 0 | 6 |
| 8 | 6 | 4 | 2 | 3 | 1 | | | | 4 | 2 | 5 | 3 | 1 | |
| 12 | 14 | 7 | 5 | 11 | 9 | | | | 8 | 6 | 11 | 9 | 7 | |
| | | 10 | 15 | | | | | | 12 | 10 | | | | |
| | | 13 | | | | | | | | | | | | |
| | | 16 | | | | | | | | | | | | |

No. 13.

No. 14.

| | | | | | | | | | | | | | | |
|----|----|----|----|----|---|--|---|--|----|----|----|---|----|---|
| | | 0 | | 0 | 0 | | 1 | | | | 0 | 0 | | 1 |
| | | 0 | | | 0 | | 2 | | 0 | | | 0 | | 2 |
| | | 0 | 0 | | 0 | | 3 | | 0 | | 0 | | | 3 |
| | 0 | | 0 | 0 | 0 | | 4 | | | 0 | 0 | 0 | | 4 |
| | 0 | 0 | | | 0 | | 5 | | 0 | 0 | | 0 | | 5 |
| | 0 | 0 | | 0 | 0 | | 6 | | 0 | 0 | | 0 | 0 | 6 |
| 8 | 6 | 4 | 2 | 3 | 1 | | | | 8 | 6 | 4 | 2 | 3 | 1 |
| 12 | 14 | 7 | 5 | 11 | 9 | | | | 12 | 14 | 7 | 5 | 11 | 9 |
| | | 10 | 15 | | | | | | | 10 | 15 | | | |
| | | 13 | | | | | | | | 13 | | | | |
| | | 16 | | | | | | | | 16 | | | | |

TWO TABBY VELVETEENS.

No. 15.

No. 16.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|--|---|---|---|---|---|---|---|---|
| | | | | 0 | | | 1 | | | | 0 | | 1 | |
| | 0 | | | 0 | | | 2 | | | | 0 | | 3 | |
| | | | | 0 | | | 3 | | | | 0 | | 5 | |
| | | 0 | 0 | 0 | | | 4 | 0 | | 0 | | | 2 | |
| | | | | 0 | | | 5 | | 0 | 0 | 0 | | 4 | |
| | 0 | | 0 | | | | 6 | | 0 | 0 | | | 6 | |
| 4 | 2 | 7 | 5 | 3 | 1 | | | | 4 | 2 | 7 | 5 | 3 | 1 |
| 8 | 6 | | | | | | | | 8 | 6 | | | | |

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FOUR JEAN BACK VELVETEENS.

No. 17.

No. 18.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 0 | | | 1 | 0 | | | 0 | | 1 |
| 0 | 0 | 0 | | 0 | 2 | | 0 | | 0 | 0 | 2 |
| 0 | | | | 0 | 3 | 0 | | | | 0 | 3 |
| 0 | 0 | 0 | | | 4 | 0 | 0 | 0 | | | 4 |
| | | 0 | 0 | | 5 | | | | 0 | 0 | 5 |
| 0 | | | 0 | 0 | 6 | 0 | | 0 | | 0 | 6 |
| 7 | 5 | 3 | 4 | 2 | 1 | 7 | 5 | 3 | 2 | 4 | 1 |
| 9 | 8 | 6 | | | | 9 | 8 | 6 | | | |

No. 19.

No. 20.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 0 | | | 1 | 0 | | | 0 | | 1 |
| 0 | | | | 0 | 3 | 0 | | | | 0 | 3 |
| | | 0 | 0 | | 5 | | | | 0 | 0 | 5 |
| | 0 | 0 | 0 | 0 | 2 | | 0 | | 0 | 0 | 2 |
| 0 | 0 | 0 | | | 4 | 0 | 0 | 0 | | | 4 |
| 0 | | | 0 | 0 | 6 | 0 | | 0 | | 0 | 6 |
| 7 | 5 | 3 | 2 | 4 | 1 | 7 | 5 | 3 | 4 | 2 | 1 |
| 9 | 8 | 6 | | | | 9 | 8 | 6 | | | |

In these four plans, it will be observed, that the treading is not wholly alternated; for, in Nos. 17 and 20, the treadles 1 and 2 are placed together, at the right side, and therefore must be wrought in succession by the weaver's right foot. The same will be observed of the treadles 2 and 3 in Nos. 18 and 19, which are placed to answer the weaver's left foot. In the former case, he is said to hop with his right foot, and in the latter with his left.

CORDS.

QUEEN'S CORD.

CORDED VELVET.

No. 21.

No. 22.

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|--|----|---|---|---|---|---|---|---|---|----|----|---|---|
| | | | | 0 | | 7 | 3 | 1 | 0 | | | | | | 11 | 9 | 3 | 1 |
| | 0 | 0 | | | | 10 | 4 | | 0 | | 0 | | | | 13 | 7 | 5 | |
| 0 | | | 0 | 0 | | 9 | 5 | | | 0 | 0 | 0 | 0 | | 14 | 8 | 2 | |
| | 0 | | | | | 8 | 6 | 2 | | | | 0 | | | 12 | 10 | 6 | 4 |
| 6 | 4 | 2 | 3 | 1 | | | | | | 6 | 4 | 2 | 3 | 1 | | | | |
| | | 5 | | | | | | | | | 5 | | | | | | | |

JEAN BACK
VELVET CORD.

DOUBLE
KING'S CORD.

No. 23.

No. 24.

| | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|---|---|--|--|---|----|---|---|----|----|---|---|--|---|
| | | | | 0 | | | | | 1 | | | 0 | 0 | 0 | | 0 | | 1 |
| | | | | | 0 | 0 | | | 2 | | | 0 | 0 | 0 | | | | 2 |
| | 0 | 0 | | | 0 | | | | 3 | 0 | 0 | 0 | | | | | | 3 |
| 0 | 0 | | 0 | 0 | | | | | 4 | | | 0 | 0 | | | | | 4 |
| | | | | 0 | 0 | | | | 5 | | | 0 | 0 | 0 | | | | 5 |
| | 0 | | | | 0 | | | | 6 | | | 0 | 0 | | | | | 6 |
| 8 | 6 | 4 | 2 | 3 | 1 | | | | | 2 | 4 | 8 | 12 | 3 | 1 | | | |
| 12 | 14 | 7 | 5 | 11 | 9 | | | | | 6 | | | | 7 | 5 | | | |
| | | 10 | 15 | | | | | | | 10 | | | | 11 | 9 | | | |
| | | 13 | | | | | | | | | | | | | | | | |
| | | 16 | | | | | | | | | | | | | | | | |

NEW DOUBLE JEAN CORDS.

No. 25.

No. 26.

| | | | | | | | | | | | | | | | | | | |
|---|---|----|---|---|---|---|---|---|---|---|---|----|---|---|---|---|---|---|
| | | | | 0 | | 5 | 1 | 0 | 0 | | | | | | | | | 1 |
| | | | | | 0 | 0 | | | 6 | 2 | | 0 | 0 | | 0 | | | 2 |
| 0 | | | | | 0 | | | | 3 | 0 | | | | | 0 | 7 | 3 | |
| 0 | 0 | | | | | | | | 4 | | | | | 0 | 0 | 8 | 4 | |
| 0 | | | 0 | 0 | | | | | 7 | | 0 | 0 | 0 | | | | | 5 |
| 0 | 0 | 0 | | | | | | | 8 | | | 0 | 0 | 0 | | | | 6 |
| 8 | 6 | 4 | 2 | 3 | 1 | | | | | 8 | 6 | 4 | 2 | 3 | 1 | | | |
| | | 7 | 5 | | | | | | | | | 7 | 5 | | | | | |
| | | 10 | 9 | | | | | | | | | 10 | 9 | | | | | |

A SEVEN SHAFT CORD.

No. 31.

| | | | | | | | | | | | | |
|----|----|----|----|----|---|---|--|--|----|---|---|---|
| | 0 | | | 0 | | | | | 7 | | 1 | |
| | | | | 0 | 0 | | | | 8 | | 2 | |
| | 0 | | | | 0 | | | | 12 | 9 | 6 | 3 |
| | 0 | 0 | | 0 | 0 | | | | | | | 4 |
| | 0 | | | 0 | 0 | 0 | | | 11 | | | |
| | | 0 | | 0 | 0 | | | | | | | 5 |
| | 0 | 0 | | 0 | | | | | 10 | | | |
| 8 | 6 | 4 | 2 | 3 | 1 | | | | | | | |
| 12 | 14 | 7 | 5 | 11 | 9 | | | | | | | |
| | | 10 | 15 | | | | | | | | | |
| | | 13 | | | | | | | | | | |
| | | 16 | | | | | | | | | | |
| | | 17 | | | | | | | | | | |

The above cord stands round and finishes well; and by adding the shot 17, below the line on the treadles, it will take on more weft. The same is to be understood of any other treading, which is marked in this manner.

LITTLE EIGHT SHAFT CORD.

No. 32.

| | | | | | | | | | | | |
|---|---|----|----|---|---|---|--|--|----|---|---|
| | 0 | 0 | | | | | | | 9 | | 1 |
| | | 0 | | | 0 | | | | 10 | | 2 |
| | 0 | 0 | 0 | | | | | | | | 5 |
| | 0 | | 0 | | | | | | 12 | | |
| | | 0 | | 0 | 0 | | | | | | 6 |
| | | | | 0 | 0 | 0 | | | 11 | | |
| | | | | | 0 | 0 | | | | 7 | 3 |
| | 0 | | | | | 0 | | | 8 | | 4 |
| 8 | 6 | 4 | 2 | 3 | 1 | | | | | | |
| | | 7 | 5 | | | | | | | | |
| | | 10 | 9 | | | | | | | | |
| | | 12 | 11 | | | | | | | | |

CORDUROYS, VELVETS, THICKSETS, &c. 125

OLD MUD, OR ADDINGTON CORD.

No. 33.

| | | | | | | | | |
|---|---|----|---|---|---|--|----|---|
| 0 | 0 | | | | | | 9 | 1 |
| | 0 | | | 0 | | | 10 | 2 |
| 0 | 0 | | | | | | 5 | |
| 0 | | 0 | | | 0 | | 12 | |
| | 0 | | | 0 | | | 6 | |
| | | | 0 | 0 | 0 | | 11 | |
| | | | | 0 | 0 | | 7 | 3 |
| 0 | | | | | 0 | | 8 | 4 |
| 8 | 6 | 4 | 2 | 3 | 1 | | | |
| | | 7 | 5 | | | | | |
| | | 10 | 9 | | | | | |

This should be woven in a 33 reed.

NEW MUD, OR ADDINGTON CORD.

No. 34.

| | | | | | | | | |
|---|---|----|---|---|---|---|----|---|
| 0 | 0 | | | | | | 9 | 1 |
| | 0 | | | 0 | | | 10 | 2 |
| 0 | 0 | | | | | | 5 | |
| 0 | | | | | 0 | | 12 | |
| | 0 | 0 | | 0 | | | 6 | |
| | | | | 0 | 0 | | 11 | |
| | | | | | 0 | 0 | 7 | 3 |
| 0 | | | 0 | | 0 | | 8 | 4 |
| 8 | 6 | 4 | 2 | 3 | 1 | | | |
| | | 7 | 5 | | | | | |
| | | 10 | 9 | | | | | |

MELLOR'S UNION CORD, FLOATING 8 AND 10.

No. 35.

| | | | | | | | | | | |
|---|---|----|----|---|---|----|----|-----|-----|---|
| | 0 | | | 0 | | | 18 | 14 | 10 | 6 |
| | | | | 0 | 0 | | 19 | 15 | 7 3 | |
| 0 | 0 | 0 | | | | | 1 | | | |
| | 0 | | 0 | 0 | | | 2 | | | |
| | | | 0 | 0 | 0 | | 11 | | | |
| 0 | | 0 | | | | | 12 | | | |
| 0 | 0 | | | | | | 17 | 13 | 9 | 5 |
| 0 | | | | | 0 | 20 | 16 | 8 4 | | |
| 8 | 6 | 4 | 2 | 3 | 1 | | | | | |
| | | 7 | 5 | | | | | | | |
| | | 10 | 9 | | | | | | | |
| | | 12 | 11 | | | | | | | |

CORDUROYs, VELVETS, THICKSETS, &c. 129

No. 42, CONTINUED.

| | | | |
|----|----|---|---|
| | 13 | 7 | 1 |
| | 11 | 8 | 2 |
| | 10 | 4 | |
| 14 | | | |
| | | 5 | |
| | | 9 | |
| | 12 | 6 | 3 |

EIGHT SHAFT CABLE CORD.

No. 43.

| | | | | | | | | | | | |
|----|---|----|----|----|---|---|----|----|----|---|----|
| 0 | | | | | 0 | | 17 | 13 | 9 | 5 | 1 |
| 0 | 0 | | | | 0 | | | | | | 2 |
| 0 | 0 | | | | 0 | | 20 | | | | 4 |
| 0 | 0 | 0 | | | 0 | | 18 | | | | 6 |
| 0 | 0 | 0 | 0 | | 0 | | 16 | | | | 8 |
| 0 | 0 | 0 | 0 | 0 | 0 | | | 14 | | | 10 |
| 0 | 0 | 0 | 0 | 0 | 0 | | | | 12 | | |
| 0 | 0 | | | | 0 | | 19 | 15 | 11 | 7 | 3 |
| 10 | 4 | 6 | 5 | 2 | 3 | 7 | 1 | | | | |
| | | 12 | 11 | 8 | 9 | | | | | | |
| | | | 14 | 13 | | | | | | | |

TEN SHAFT CABLE CORD.

No. 44.

| | | | | | | | | | | | |
|----|---|----|---|----|---|---|----|----|----|---|---|
| 0 | | | | | 0 | | 17 | 13 | 9 | 5 | 1 |
| 0 | 0 | | | | 0 | | | | | 6 | 2 |
| 0 | 0 | | | | 0 | | 19 | 15 | 11 | 7 | 3 |
| 0 | 0 | | | | 0 | | | | | 8 | 4 |
| 0 | 0 | | 0 | 0 | 0 | | | | 10 | | |
| 0 | 0 | | 0 | 0 | 0 | | | | 12 | | |
| 0 | 0 | 0 | 0 | 0 | 0 | | | 14 | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | | | 16 | | | |
| 0 | 0 | | | 0 | 0 | | | 18 | | | |
| 0 | 0 | | | 0 | 0 | | 20 | | | | |
| 10 | 4 | 6 | 2 | 5 | 3 | 7 | 1 | | | | |
| | | 12 | 8 | 11 | 9 | | | | | | |

THE BOLD CABLE CORD.

No. 45.

| | | | | | | | | | | | | | | |
|---|---|----|---|----|----|---|---|---|----|----|----|----|----|----|
| | | | | | | | | | | 34 | 30 | 26 | 22 | 18 |
| 0 | 0 | | | | | | | | | 33 | | | | |
| | | | | | 0 | 0 | 0 | | | 31 | | | | |
| 0 | 0 | | | 0 | 0 | | | | | 29 | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | | | 27 | | | | |
| 0 | 0 | 0 | | 0 | 0 | | | | | 25 | | | | |
| | | | | 0 | 0 | 0 | 0 | | | 23 | | | | |
| 0 | 0 | | | | 0 | | | | | 21 | | | | |
| | | | | | | 0 | 0 | | 35 | | | | | 19 |
| 0 | | | | | | | | 0 | 36 | 31 | 28 | 24 | 20 | |
| 8 | 6 | 4 | 2 | 5 | 9 | 3 | 1 | | | | | | | |
| | | 10 | 7 | | | | | | | | | | | |
| | | | | 12 | 11 | | | | | | | | | |

No. 45, CONTINUED.

| | | | | | | | |
|--|--|--|----|----|----|----|---|
| | | | | 14 | 10 | 6 | 2 |
| | | | 17 | | | | 1 |
| | | | | | | 3 | |
| | | | | | | 5 | |
| | | | | | | 7 | |
| | | | | | | 9 | |
| | | | | | | 11 | |
| | | | | | | 13 | |
| | | | | | | 15 | |
| | | | 16 | 12 | 8 | 4 | |

FINISHING CORDUROYS AND VELVETS.

Velvets and corduroys, after they come out of the loom, have their flushed parts cut up, the former into a uniformly smooth surface, and the latter into ridges. The piece is spread, for this purpose, on a long table, and the person who conducts this process runs the point of a sharp instrument, called a plough, along each furrow, or centre of each flushed stripe. The piece is then exposed on a table, to the action of a pair of strong brushes, which are driven across the ridges by machinery, with a reciprocating motion. At each end of the table is a roller, on one of which, the cloth is wound before the operation, and the other, with a very slow motion, receives it as it comes from the brushes. The use of this process is to raise the pile, and form the cut flushing into ridges above those parts which are incorporated with the warp. When the piece has passed through this machine, the loose fibres are singed off, by drawing its surface over a cast-metal cylinder made red hot. The piece is then immersed in hot water, and rubbed well with a hand brush; after which it is dried, singed, and again put through the brushing machine; all of which operations being repeated three times in the same order of succession.

The piece is next put into a tubful of hot water, with which are mixed a little vitriol and pearl ashes. This ley is called a chemic. When it is taken out of the chemic, it is spread on the grass, where it lies two or three days, when it is again put through the chemic, and rubbed well with the hand brush, to remove any fire stains or brown spots that may be remaining. Two or three days more exposure to the air on the green, will prepare it for dyeing the darker colours; but for the lighter shades, it will require a little more bleaching.

PROCESS OF DYEING CORDUROYS, &c.

The utensils used in dyeing these fabrics upon a small scale, are a pan or boiler as large as the half of an oil pipe, a scoop, or tin laddle with a long handle, and several tubs of a size sufficient to hold a piece and as much liquor as is requisite to work it in.

Then, for dark olive, take one scoopful of fustic, and one scoopful of shumac, and two scoopfuls of logwood cut small. Fill the pan nearly full of water, into which put the fustic, and boil it for an hour fully. Boil the shumac and logwood separately in the same manner, and put their respective liquors into separate vessels for use.

Dissolve a quart of copperas in about 20 quarts of boiling water. Dissolve also, a quart of blue vitriol in the same quantity of hot water in another tub. This done, take 9 scoopfuls of the fustic liquor, seven scoopfuls of the shumac liquor, and one scoopful of the logwood liquor, and mix them well together in a tub. Wet the piece which is to be dyed, thoroughly in warm water, to make it take on the colour evenly, then work it well in the above mixture for about an hour, turning it round regularly upon a small wench. Take some warm water in a tub, and add to it one quart of the copperas liquor. Work the piece in this for about half an hour. It is next washed clean in hot water, and then soaked and rinsed well in a tubful of the fustic liquor taken by itself; after which, it is again put through the dye mixture as at first.

If the cloth is for a dark colour, more logwood is now added to the first mixture. Take some warm water in a tub, and add to it one quart of the copperas liquor, and one quart of the blue vitriol liquor; in this it is well worked, and afterwards washed in warm water. It is now run through a tubful of the fustic liquor, adding fresh liquor, if necessary.

These operations are to be repeated as often as is requisite to give the piece the intended shade of colour. They are in general repeated five times. The tubs are all emptied, and a new mixture of the dye colours prepared, as at first, before the last operations; previous to which, it must also be well soaked in the fustic liquor. In this last dye liquor, the shumac is omitted; and, when the shade is to be dark, the logwood prevails; but when light, the fustic.

After passing through the dye liquor for the last time, it is wrought in hot water mixed with a quart of the vitriol liquor to green it. Wash it now well in warm water, and it is finished.

To give the piece a glossy appearance, and raise the pile, it is rubbed over with bees wax, and afterwards polished with a smooth stone.

TO DYE A LEAD COLOUR.

Take a scoopful of shumac liquor, a scoopful of fustic liquor, and about a quarter scoopful of logwood liquor, mix them well together, and add water till the tub be about half full. In this the piece is to be well wrought. Take half a tubful of warm water, into which put a pint (half a quart) of copperas liquor. Put the cloth through this, and afterwards wash it in warm water, and it is finished.

TO DYE A SILVER DRAB.

Take two scoopfuls of fustic liquor, and one of shumac liquor, mix them well with warm water till the tub be about half full, then dye the piece. Work it well again in about half a tubful of warm water mixed with a pint of copperas liquor, after which, wash it well in warm water. Sometimes two or three drops of the oil of vitriol are added, the last time it is washed.

Such are the processes commonly employed to prepare these goods for the market; though of late, some of the smaller patterns are sold in the uncut state, especially those which are woven in the power looms; not, however, by the yard, but at so much a pound weight, which is a great inducement to make a substantial fabric.

PLUSH VELVET.

Plush velvet or shag, is woven on a principle something different from any of the preceding fabrics. It consists of two warps, one called the main warp or ground, which is commonly made of hard silk, and the other, the pile warp. These warps are beamed on separate rolls, the latter being placed below the former.

When the heading or end of the piece is woven, the weaver raises the pile warp, which is drawn on a separate leaf from the ground, and into this shade he introduces a wire, which is longer than the breadth of the cloth. A few shots of the ground is woven and another wire introduced, and so on with a third wire. In each of these wires is a groove, along which, the weaver runs the point of a sharp instrument called a trivet, which cuts the pile, and relieves the wires in succession. The first wire, therefore, when thus relieved, is again put into the fourth pile shed, and after a few shots of the ground are woven, the second wire is inserted into the fourth pile shed; and this operation is repeated till the piece is finished. The pile warp is commonly made of softer silk than the warp, or of a fine kind of goat's hair, and the surface of the shag is afterwards cut evenly and smooth with a pair of shears. On this principle, is woven that fabric which is made into hats.

CHAP. VII.

CROSSED WARPS.

THIS branch of weaving comprehends all that variety of texture whose warp threads, or any portion of them, do not lie parallel to each other in the cloth, but are either twisted together like a cord between the shots of weft, or otherwise crossed in front of the reed.

SECT. I. PLAIN GAUZE AND ITS VARIETIES.

This is the most simple, as well as the most extensively useful branch of cross-weaving; and as it may be considered the basis of all the other varieties, a minute description of its mountings and process of weaving will be necessary, especially as no idea of the other branches can be rightly formed without some previous knowledge of its principles.

The mounting of a plain gauze consists of two back leaves of common heddles, two plain front leaves, called standards, and two half leaves, called doups. The two back leaves are placed about three inches behind the standards; and the half leaves are placed, one behind the upper half of the back standard, and the other in front of the under half of the fore standard. Hence, the former of these half leaves is usually denominated the upper or back doup, and the latter the under or front doup. Each half heddle, bow, or doup, of the upper half leaf, passes through the under part,

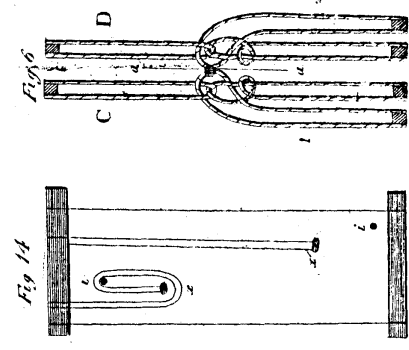
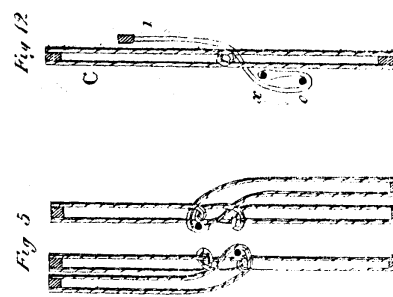
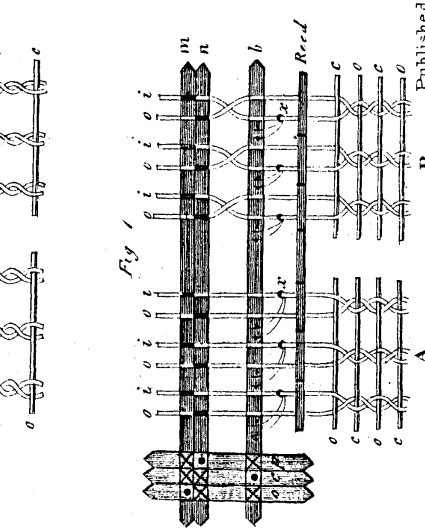
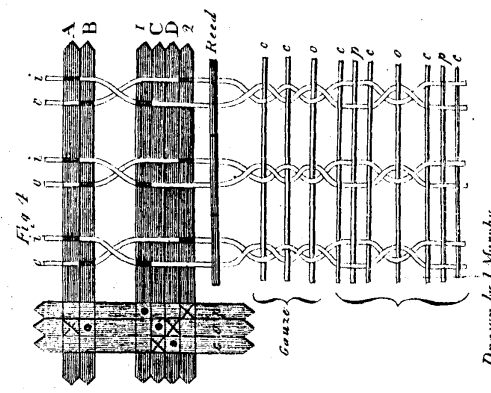
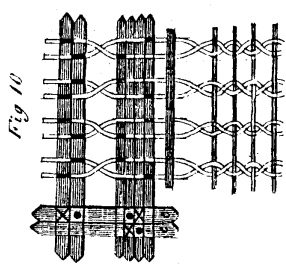
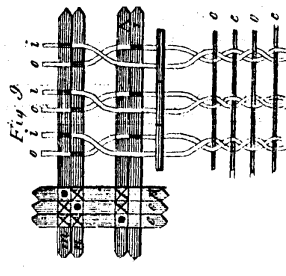
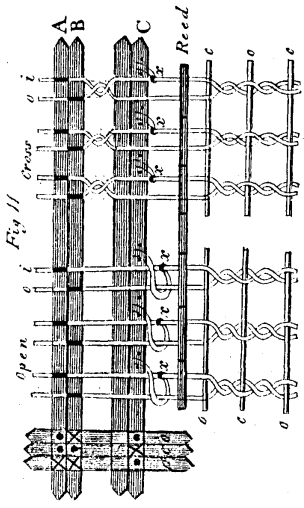
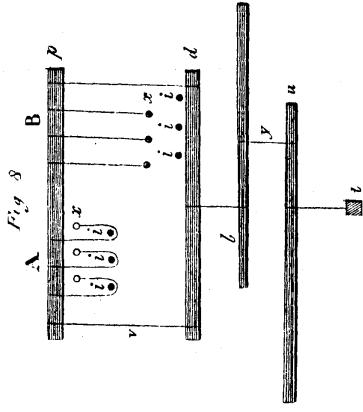
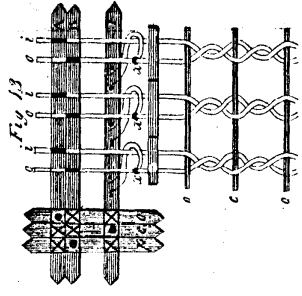
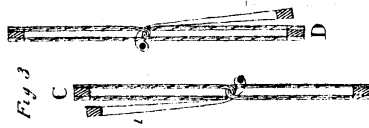
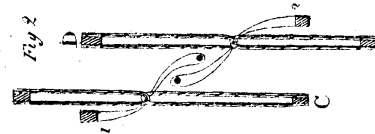
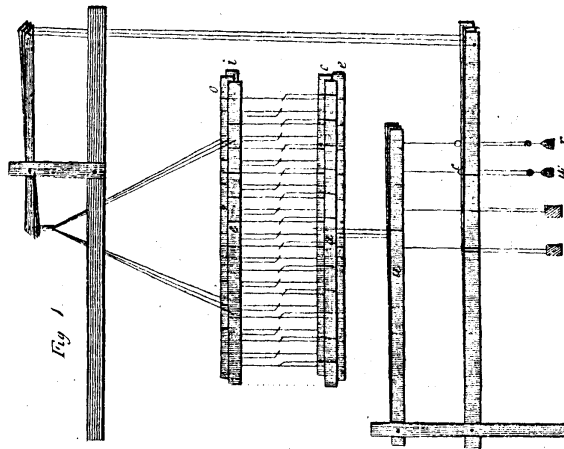
o below the clasp of its respective standard; and each doup of the under half leaf, passes through the upper part of its standard, as represented in Figs. 2 and 3, plate 5, where C is the back standard, and 1 its doup; and D is the front standard, and 2 the under doup. Fig. 1 of the same plate, is a front view of the fore mounting of a gauze, the back leaves being omitted. *a* shows the position of the under doup shaft, *ee*, the shafts of the fore standard, *i* is the shaft of the upper doup, and *oo* the shafts of the back standard; *w*, *x*, are weights suspended from the half leaves, to keep them tight to their standards in the cross shed, or when the doups and standards are in the position represented in Fig. 3, and to relieve them when the open shed is formed as in Fig. 2.

Fig. 4 is the draught and cording of a plain gauze. A and B are the back leaves or back mounting. C and D the two standards, 1 and 2 the upper and lower doups. Two treadles only are necessary for plain gauze: but when plain texture is required, another treadle is added for that purpose. In this plan the treadle for the cross shed is marked *c*, that for the open shed *o*, and the plain treadle is marked *p*. The same letters placed at the ends of the shots of weft in the specimen of cloth annexed, refer to the treadles which open their respective sheds.

TO DRAW OR ENTER A GAUZE.

It has been already noticed, that each doup of the half leaves 1 and 2, pass through the opposite parts of their respective standards. They are kept in this position until the warp be entered, by round rods, which are introduced into their loops or bows, as represented by the dots in the Figs. 2 and 3. The draught, Fig. 4, contains three splitfuls of gauze warp, one thread of which being marked *i*, and the other *o*, the first thread *i*, of each splitful, is taken through the

PRINCIPLES OF CROSS WEAVING



Drawn by J. Murphy

Published by Blaché & Son, Glasgow

Fig. by A. Macdure

under part, or below the clasp of a heddle on the back leaf A, and the other thread *o*, is taken through the upper part, or above the clasp of a heddle on the back leaf B; so that both these leaves can produce only one shed. When the whole of the warp is drawn through the back heddles in this manner, a new lease is formed in their front, for the purpose of drawing the warp again through the front mounting. One shed of this lease is obtained by raising the leaf B and sinking the leaf A with the hand. The other shed is forced through the leaves from the rod which is in the contrary shed behind.

When the new lease is thus obtained, the yarn roll with the back leaves are suspended, in the usual way, to the top of the loom, and the entering commences anew through the front mounting. The thread *i*, which was drawn through the under part of the leaf A, and which is the first that occurs in the lease, is again taken through a doup of the half leaf 1, in the same opening with the rod above mentioned, or where the dot is placed in the Fig. The other thread *o*, which passes through the upper part of the leaf B, is, in like manner, taken through a doup of the half leaf 2, facing the former doup, between the standards: and this finishes the draught of one splitful. This process is to be repeated until all the warp is entered; after which, the rods that were between the mountings, and those in the doups, are taken out.

In this process it may be observed, that the threads *i* and *o* are not actually crossed in the drawing; for, as the thread *i* is taken through the back heddle to the right of the thread *o*, and is afterwards drawn through the upper doup which is on the left of it, these two threads will naturally cross each other between the mountings, the thread *i* above the thread *o*, when the warp is stretched in the loom. To effect this, it is only necessary to set aside the fore doup and standard in drawing each splitful, until the thread *i* be taken

into the upper doup, after which the thread *o* will come into its proper place. But it is more expeditious, when the under doup is picked out, to put the middle finger of the right hand through the loop of it, and then the fore finger of the same hand into the loop of the upper doup; then the person who gives in the warp has only to put the first thread *i* on the fore finger, and the thread *o* on the middle finger, of the person who draws in the warp, and he takes both threads through at one time.

When any portion of the warp is to be woven into the plain texture, such as the selvages, stripes, or borders of handkerchiefs, it is drawn without being crossed between the mountings; that is, the thread *i* is drawn through the under part of the leaf A, and the thread *o* through the upper part of the leaf B, as in the gauze part; but the thread *i* is afterwards drawn through the under doup 2, and *o* through the upper doup 1, parallel to each other.

The doups and standards here described have been long in use, and are still employed on occasions; but another form has been recently introduced, which is considered an improvement in gauze weaving. The standard is made with an eye instead of the common clasp, and one half of the doup runs through it, the other half, or side, being either above or below the clasp, according as it is in the fore or back standard. This will appear by consulting Fig. 5; in which the dots point out where the warp threads pass through the doups. The round rods which were used in the doups of the former mounting, are unnecessary in this, as the clasps of the standards are always in the loops of the doups, and keep them sufficiently open. The warp is taken through this mounting in the same manner as the former, observing to keep the doups slack, that they may be easily taken through their standards.

These standards are considered to possess several advantages over the others, particularly in taking off the friction

when the cross shed is forming, although the weaver should employ both of his feet on the treadles, which is not the case in the first form. The eyed standards also prevent the doups from falling out of their places when any of the warp threads are broken, which, in the other mounting, frequently occasions some trouble and breakage before they can be replaced.

As it is customary to make use of four leaves of heddles in weaving the finer setts of plain cloth, to prevent the friction occasioned by crowding too many of the clasps together; so in gauze weaving it has been found advantageous, for the same reason, to cast the upper halves of the fore standards, and under halves of the back standards on two shafts; by which means the doups are more scattered, and pass each other much easier than in the other mountings. Mountings made in this manner are said to have clifted standards.

TO MOUNT A GAUZE.

Gauze is commonly mounted with couplets, long and short marches, which have been explained in the first chapter; although jacks be sometimes employed for the back leaves. Each upper shaft has its respective coupler and long march for moving it, and each under shaft has its short march; and all these connexions are formed in the manner already described. This done, it only remains to tie up the treadles and apply the doup weights.

By referring to Fig. 4, Plate 5, it appears that there is a dot where the treadle *c* crosses the standard *D*, and a cross where the same treadle crosses the standard *C*. The dot shows that the standard *D* is raised by this treadle, and the cross, that the standard *C* is sunk. A cord is therefore taken from the long march of the leaf *D*, and another from the short march of the leaf *C*, to this treadle, the blank squares denoting that no connexions are there necessary.

On the treadle *o* there is a raising mark for the standard *C*, and another on the back leaf *B*, while there is a cross or sinking mark on the standard *D*, and another on the back leaf *A*; which indicate that the two former are raised, and the two latter sunk by this treadle. On the treadle *p* there is a raising mark in the upper doup 1, and a sinking one on the under doup 2. These connexions are therefore all formed in the same manner as on the first treadle.

When a gauze web is justly mounted, the plain shed should stand a little open, generally from a half to three-fourths of an inch, that the doups may be kept clear of each other, or to allow them sufficient time to pass from the slack to the tight state before the succeeding shed is opened. This is effected by raising the back doup and standard a little, by the snitches above, and depressing the front doup and standard in the same manner, and tempering all the foot cords accordingly, before the justers are taken down.

It is observable in the gauze mounting, that, as the under half leaf has neither couper nor long march, nor the upper one a short march, no connexions can be formed by these means between them and the treadles. As the open shed, however, is formed merely by the two back leaves, the doups being all slack; and the cross shed, by the two standards, the doups being tight, See Figs. 2 and 3, these changes are regulated by two small weights suspended from their respective marches, as represented in Fig. 1. The weight *w* is suspended from the short march *u* of the under doup, and is tied to a small piece of wood *c*, commonly a piece cut off an old bobbin, which rests in the open shed on the front long march; but in the cross shed, the whole of the weight is transferred to the short march *u*, by which the doups are kept tight to their standards. In like manner the weight *v* is suspended from the third short march, counting from the front, which is connected to the back standard, and is tied to a similar piece of wood which rests occasionally on the third

long march, or that which is connected to the upper doup. Hence it follows, that in the open shed the back standard is raised, which takes the whole of the weight, by means of its short march, off the long march of the upper doup, which is thus left in the slack state. In the cross shed, however, the back standard is sunk, which leaves the weight wholly on the long march of the upper doup, and keeps it in the tight state.

Hence it is evident, that when the back leaf A is sunk, and the leaf B raised, See Fig. 4, a shed is formed by these leaves; and as the back standard is likewise raised and the front one sunk, which take all the weight off their respective doups, these doups will be slack and crossed by the action of the warp, as represented in Fig. 2, and the thread *i* will sink on the right of the thread *o*. But when the fore standard is raised and the back one sunk, which is effected by the treadle *c*, the weights are all upon the doups, which keep them close to their standards; and therefore the thread *i* is now sunk on the left of the thread *o*, which forms the gauze texture represented in the Figure. As the warp which is drawn on the upper doups always sinks, and that on the under ones constantly rises in weaving plain gauze, it will follow, that the plain treadle, wrought alternately with either of the other two, will produce plain cloth. But as the selvages are generally woven plain, which is effected by drawing them without crossing, the cross treadle, which reverses the motion of the standards, must be chosen for this purpose. This will evidently appear by comparing the few shots of plain, in the specimen before us, with the gauze twists.

The back and front mountings of a gauze, should stand about three and a half to four inches separate, that the cross shed may be freely formed, without straining the warp. Particular attention is also necessary in adjusting the doup weights; for, if they were too light, the doups would project through the standards in the cross shed, and produce a con-

siderable deal of attrition, with a grating noise which is known among tradesmen by the name of *crunching*: and were the weights too heavy, they would draw the doups backwards through their standards and strain the warp. Should the rubbing and noise continue after the web may be considered justly mounted, they will often be removed by shifting the cord which connects the under doup shaft to the first short march, a little to one side. There is no rule for determining the precise weight which is to be applied to each half leaf; for this will, in general, depend on the quantity of warp in the web, and the distance at which the weight is suspended from the centre of motion.

These are the mountings which are in common use for weaving plain gauze, or when little other mounting is requisite; but there are other methods of producing the gauze twist which require explanation, as they are occasionally adopted in different kinds of fancy weaving. And first, of

WEAVING GAUZE BY THROUGH-PUTS.

The original method of weaving gauze, at least that by which it was woven in Paisley before the doups were introduced, was by a mounting similar to that now in use for weaving the false spider net. This mounting consisted of a back leaf of eyed heddles, and the two standards C and D, Fig. 6, with two under doups facing each other, and connected together between the standards by an eye, where the bead is placed in the present Fig. One thread of each splitful was drawn through the eye of a heddle on the back leaf, and passed between the standards immediately above the eye. The other thread had no back heddle, but was drawn through the eye which connected the doups.

In weaving gauze by this mounting, the thread which was drawn on the back leaf was sunk at each tread, while the

other thread was raised to the right and left of it, alternately, by the standards. Thus, by raising the standard C and sinking D, the doup 1 was tight, and the other, 2, being slack, yielded to the motion of the rising standard, by which the thread in the eye of the doup was raised to the left of that in the back leaf. By raising the standard D and sinking C, the threads in the doups were raised to the right of those on the back leaf, and so on alternately.

Plain texture was produced by sinking both standards and raising the back leaf for the plain shed, which could be reversed by any of the other two. These doups and standards were known by the name of through-puts: they have long ago been superseded by the doups and standards formerly explained, though they are now employed for spidering, which will be treated of in its proper place.

WEAVING GAUZE BY A BEAD LAM AND STANDARD.

This mounting, which is sometimes employed for the gauze part of nets, consists of two back leaves of eyed heddles, a standard and an upper half leaf of doups, which are called bead lams, from their having small glass beads in their loops or bows, to avoid the friction of the warp passing through them.

Fig. 7. is a plan of this mounting, in which *m* and *n* are the back leaves, *b* the standard through which the bead lams pass, in the same manner as in the other gauze mountings. The two threads *o* and *i* which pass through the same interval of the reed, are drawn through the eyes of the heddles on the back leaves *m* and *n*; and the thread *i* is afterwards taken through the bead *x* of its respective bead lam or doup. The thread *o* has neither doup nor standard.

The open shed of this mounting, or slack state of the bead lams, is shown by the three splitful of warp marked A, Fig. 7. and the bead lam *x*, one seen passing below

the threads *o*, and rising to the right, as represented at A, Fig. 8, which is an elevation of the bead lams and apparatus for working them. This shed is opened by raising the back leaf *m* and sinking *n*, the bead lams being slack, and yielding to the warp. The cross treadle sinks the two back leaves, by which all the warp is taken down to the race rod; at the same time the bead lam shaft *b* is raised, the lams being tight: and consequently, the threads *i* are now raised to the left of the threads *o*, as represented at B. See Figs.7 and 8.

As that half of the warp which is drawn through the bead lams, is forced up in forming the cross shed, while the other half remains on the race rod; to prevent it from being too much strained at this tread, it is beamed on a separate roll, and slackened more than the other, when the cross treadle is pressed down. Sometimes the standard is omitted, which reduces the mountings to two back leaves and a single half leaf of bead lams; but the taking in of the warp, and the opening of the sheds, are the very same as when the standard is employed.

In this method of weaving gauze, it will be observed, that, in forming the open shed, the bead lams must be so much slackened as permit them, not only to sink to the race rod, but to rise again to the upper part of the shed, after passing below the other thread of the same split. The bead lams are therefore made considerably deeper than the doups formerly described; and nearly double the perpendicular range is given to the bead lam shaft. Fig. 8 is a view of the apparatus for giving this additional range, which consists, simply, of the two short marches *a* and *b*, with their centres reversed. The under shaft *p* is connected to the under shaft *a*, by the two cords *v* and *w*, which are called bridles. The under shaft is tied to the short march *b* in the usual way, which is again connected by the cord *y* to the other short march *u*, the centre of which is at the op-

posite part of the loom; and this last march is tied to the treadle *t*. In every other respect, the shaft *p*, when the standard is employed, is mounted like the upper cloup of a common gauze: and when the standard is omitted, the bead lam shaft is mounted with a couper and long march, to the latter of which, a small weight is suspended, to keep the lams moderately tight.

It is now plain, that when the treadle *t* is pressed down, the perpendicular range of the shaft *p* will be increased, in proportion as the cord *y* is tied nearer to the end of the lowest march; and consequently, when a greater range is required, it is only necessary to shift the cord *y* toward the right, and the contrary when it is less; by which means, any proposed range may be obtained by the same sinking of the treadle. By this simple apparatus, the great range is likewise given to the bead lam shaft of the catgut, which will be explained further on. It may likewise be observed, that the gauze warp is twisted the contrary way by this method, from what it is by the common mounting, which is necessary to be taken notice of in applying it to some species of fancy weaving.

The plain shed of this mounting is produced by sinking the back leaf *m* and raising *n*, the bead lams being slack; and this shed is reversed by the cross one.

This method of weaving gauze, especially when the standard is omitted, can only be applied when the weaving motions are very slow, as in several varieties of nets, or other extensive mountings: for it must be obvious, that unless the lams are allowed sufficient time to pass from the open or slack, to the tight state, before the succeeding sheds be opened, they will constantly be getting entangled among themselves, and either break the warp, or otherwise obstruct the weaver's progress.

WEAVING GAUZE WITHOUT THE UPPER DOUP AND STANDARD.

The most approved construction of the gauze mounting, however, where several sets are requisite, is by omitting the upper doup and standard, and making use of eyed heddles for the back leaves. Fig. 9 is a plan of this mounting, in which *m* and *n* are the two back leaves, 1 the under doup, and A its standard. The threads *i* and *o* are drawn through the eyes of the heddles on the back leaves as in the preceding mounting. The thread *i* has neither doup nor standard; but *o* is drawn through the under doup 1, in the very same manner as in the full mounting.

To produce the gauze twist by this mounting, the cross treadle *c* sinks the two leaves *m* and *n*, by which the whole of the warp is taken down to the race rod, and the shed is opened by raising the standard A with the doups tight. The open treadle *o* sinks *m* and raises *n*, while the doups are slack, and yield to the shed formed by the back leaves, as in the common way. The plain treadle *p* raises the leaf *m*, sinks *n*, and sinks the doup and standard.

As the warp threads, however, which are marked *o*, have more stress to bear while the cross shed is forming, than the others, they are beamed, as in the foregoing case, on a separate roll, which is allowed to yield freely to the tread. This roll is usually placed before the other.

REVERSING THE GAUZE TWIST.

In compliance with the general practice of entering a gauze web into the common mounting, the first thread which is drawn on the back leaf is crossed to the left above the other thread of the same splitful; but the same mounting, with the very same cording, will produce a gauze equally good, although this order of drawing in the warp should be reversed. Thus, the first thread *i*, Fig. 4, may

be drawn through the upper part of a heddle on the leaf B, and again through the under doup 2; and the other thread *o* may be taken through the under part of a heddle on the leaf A, and crossing above *i* to the right, pass again through the upper doup 1: and this draught and cording will produce a gauze differing in nothing from that in Fig. 4, but that the twists on the warp are thrown the contrary way. Fig. 10 is an example of this method of weaving gauze, in which one splitful is drawn in the common way, and the other reversed, alternately. This variety in gauze weaving is sometimes introduced with good effect, especially if the two threads in each split be of different colours.

LINO, OR LINAU.

This species of gauze is woven merely by treading the plain and open treadles, of the common gauze mounting, alternately with the cross one: that is to say, the cross treadle is pressed down for every second shot, and the other two alternately. A specimen of the lino is given in Fig. 4, and the order of treading is marked by the letters *o*, *c* and *p*, opposite to the shots of weft which are respectively thrown into the open, cross, and plain sheds.

PIQUETS.

The variety of gauze generally known by the name of piquets, are simply plain gauze, omitting every third or fourth splitful of warp. They are woven in fine reeds, leaving the third, fourth, &c. interval empty; by which, two, three, or more splitfuls of warp run together in a stripe. Piquets are frequently ornamented like the gauze with spotting, spidering, lappeting, &c.

Piquets, however, are at present woven on silk in the form of turkey gauze, of which an example will be given under that article.

RIDDLES.

The warp of these run in stripes in every respect like the piquet, and they are checked by throwing in one or more sheds of plain occasionally, as in the lino. These grounds are also frequently ornamented with spotting, lapping, &c. and are generally used for the bosoms of handkerchiefs, &c.

VEINING.

This is the production of a single gauze mounting, which is frequently added to that of gauze or plain ground, as a species of ornament. It is often applied as guards in plain cloth, where there are a few intervals of the reed empty, which are to be afterwards ornamented with the needle for trimmings, &c. The warp of a vein is only crossed at every fourth, sixth, &c. shot; the intermediate shots, which are alternate in the ground, being all thrown into one shed, forming, to appearance, only one coarse shot. Veins are also woven in small stripes along with lappets, victories, &c. which undergo no additional process. See an example of veining, along with gauze and plain texture in Fig. 11. Plate 6

CATGUT

Is another light fabric, resembling gauze, and is woven nearly in the same manner as that by the bead lams. The only difference between gauze and catgut is, that the warp of the latter receives half a twist more between the shots of weft than that of the former.

There are two ways of producing the catgut twist: one by two back leaves of eyed heddles, and a bead lam shaft

and standard; the other by two back leaves and the bead lams, omitting the standard.

Fig. 11, Plate 5, is a plan of this mounting, with the bead lam and standard, exhibiting both the open and cross sheds.

The open shed of this mounting is formed by raising the leaf A and sinking B, while the standard C is raised and the lams slack; which, passing round the threads *o*, are raised by the threads *i* to the upper part of the shed, as represented in Fig. 12. This shot is pointed out in the specimen of cloth annexed to the plan, by the weft shot *o*. The cross treadle *c* raises both of the back leaves, and consequently, the whole of the warp; and the shed is opened by sinking this standard with the lams tight. While this shed is forming, the bead lams *x*, with their threads *i*, repass below the threads *o*, and, after again crossing above them, sink to the bottom of the shed on the right side, close to their standards, or in the tight state. The weft shot *c* distinguishes this shed in the specimen of cloth. Thus, by working these two treadles alternately, the warp threads are twisted and untwisted half a turn more than the common gauze warp, as will plainly appear by examining the Figs. The plain treadle *p* reverses the cross shed, sinking all the warp by the back leaves, and opening the shed by raising the standard with the bead lams tight.

The bead lam shaft and standard are mounted in the very same manner as represented in Fig. 8; and the necessary range is given to the bead lam shaft by shifting the connecting cord *y* to the right or left, until it be accurately ascertained.

Fig. 13 is a plan of the catgut mounting without the standard, consisting only of two back leaves and a single shaft of bead lams. The warp is taken through the back heddles, which are also eyed, in the same manner as the former; but as the standard is here omitted, the bead lams have to take half a turn more round the threads *i*, than in

the preceding mounting. This will appear by inspecting Fig. 14.

To produce the open shed by this mounting, the leaf A is raised and B sunk; at the same time, the bead lam shaft 1 is sunk, to slacken the lams. In this shed, therefore, it will appear by Fig. 13 and 14, that the bead x , with its thread o , passes both under and over the other thread i of the same split, and then sinks to the bottom of the shed, at the left side of it. In the cross shed, both back leaves are sunk, which consequently, take all the warp down to the race rod; and the shed is opened by raising the bead lam shaft, by which the thread o is twisted round i in the contrary direction, and raises at last above the shuttle to the left of it, as in Fig. 14. The weft shots at o and c , Fig. 13, will show these crossings and recrossings of the warp. Plain cloth is woven by the two back leaves, the lams being always slack. The treadles p and o are therefore wrought alternately for this purpose. It is farther to be observed, that all these bead lam shafts and standards are mounted with doup weights, as explained in the plain gauze.

Although the catgut was one of the principal textures in the silk manufacture, it has never yet been introduced with much advantage, in the manufacture of cotton. The original design of the gauze twist, seems to have been, to keep the weft shots of light fabrics at a due and regular distance from each other, so as to render the grounds sufficiently transparent, without the danger of making them thicker in one part than another, or to prevent the weft from running or crowding on the warp, as the lighter kinds of book-muslins are apt to do: and what is equally probable, to keep those spaces square, or nearly so, which are formed by the intersections of the shots of weft with the splitfuls of warp. But the silk warps, of which gauze was mostly made in Scotland, being too fine and smooth to offer the necessary resistance to the weft or shoot, to produce this effect, it may

be naturally supposed, that the additional part of twist given by the catgut mounting has been applied merely to preserve this transparency, and proportional distances between the warps and wefts.

Cotton and linen warps, however, oppose greater resistance to the weft than silk; and therefore, by slewing them lighter or thronger, these fabrics may be easily made to suit any market. The catgut twist, however, may still be more advantageously applied in some kinds of cotton goods than the gauze. It has been already employed for veining, as the additional twist is better adapted to compress those shots of weft together which are thrown into the same shed, and give them the appearance of a single shot or cord. It might also be extended to purles, victories, and some other varieties, which only require the warp to be crossed at certain intervals.

SECT. II. FANCY GAUZE.

IN the preceding section, the different methods of producing varieties of gauze, by one set of mounting, have been minutely explained: it remains in this to show how a diversity of pattern may be woven by increasing the number of mountings, as in the other branches of weaving.

The patterns which are to be treated of under this head are formed by combining either plain texture, or flushing, with gauze, as a ground. By the former of these methods, are woven those varieties which are known by the several names of purles, victories, crapes, and Turkey gauze; by the latter, chambries, gauze tweels, and Trafalgars.

GAUZE AND PLAIN TEXTURE.

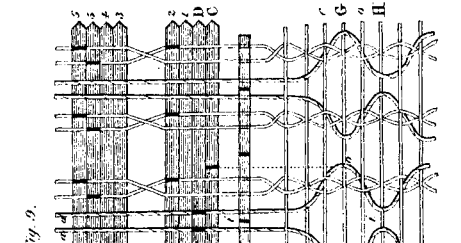
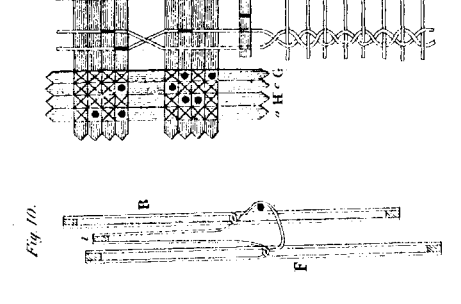
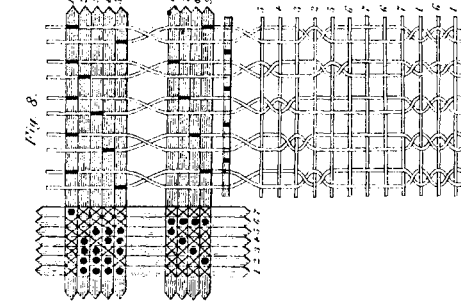
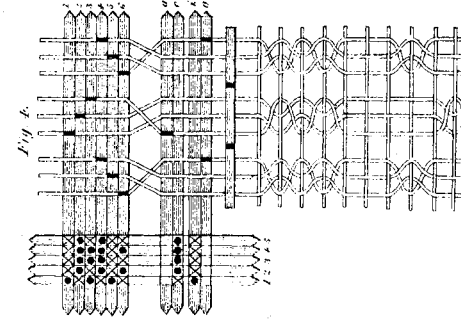
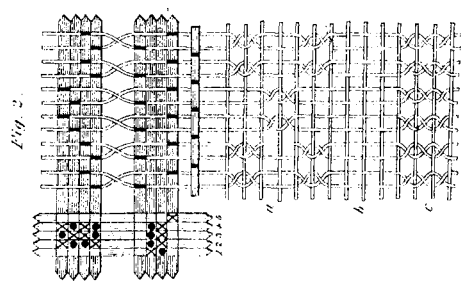
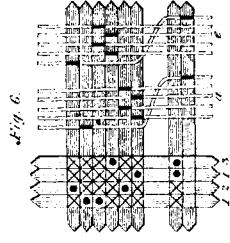
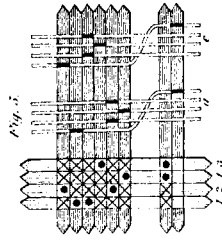
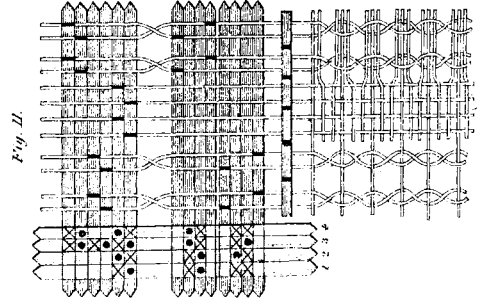
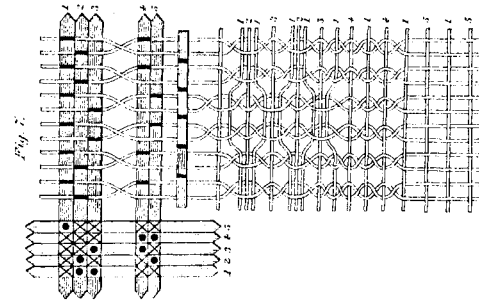
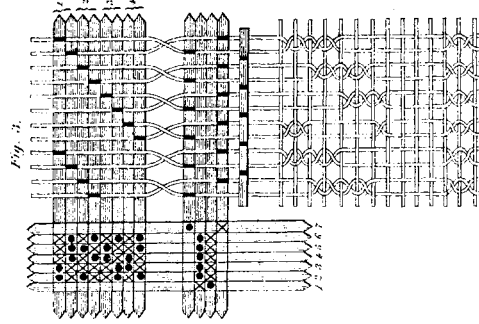
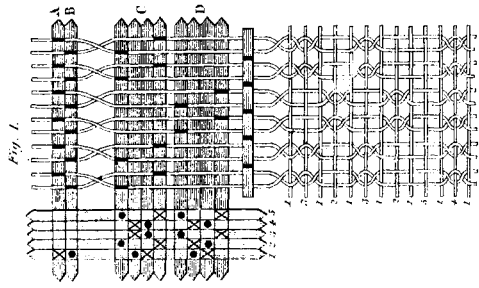
There are two methods of producing patterns on this principle: the one, by a single set of back leaves and two

or more sets of doups and standards; the other, by one set of front mounting, and additional sets of back leaves. The former of these methods is usually employed when two sets only are necessary; the latter, when the mounting is more extensive.

PURLES.

Fig. 1, Plate 6, is the plan of a mounting with two sets of doups and standards. It consists of the two back leaves A, B, and the two front sets C, D, which are the same as for the plain gauze. The warp is drawn into the back leaves in the usual way, and two splitfuls are drawn alternately on the two front sets. The treadle 1 forms the open shed of both mountings; treadle 2 produces the plain shed by the set of doups and standards C, and the cross one by the other set D. Treadle 3 reverses this cording; the set C forming the cross shed, and the set D the plain one. The cross sheds of both sets are formed by treadle 4, and both plain ones by treadle 5. All these sheds are pointed out by the numbers of the treadles at the ends of the shots in the specimen. It will be observed, that, in weaving plain gauze, by doups and standards, the upper doup thread sinks to the race rod in both sheds, and rises only in the plain one. That is to say, it sinks in the cross shed to the left of the under doup thread, and in the open one, to the right of it: consequently, plain texture can be woven by either of these sheds formed alternately with the cross one. When, therefore, this species of patterns are woven by additional front sets, the open shed, which is produced by the two back leaves, extends to all the warp, and, of course, is formed both in the gauze and plain parts: and as the upper doup threads lie on the right of the others in the plain parts, the twist is given by the cross treadle.

PRINCIPLES OF CROSS WEAVING.



1854 No. 1. 1854 No. 1. 1854 No. 1.

Drawn by J. H. Wright

Published by Hawley & Son, Glasgow.

When the patterns, however, are woven by additional back sets, the cross shed is common to both in the gauze and plain parts: and as the upper doup threads are now on the left of the others in the plains, the warp is crossed or twisted into gauze by the open shed, and reversed by the cross one.

Fig. 2 is the plan of a mounting for the same pattern as the former, woven with two sets of back leaves. The leaves of one of these sets are marked 1 and 2, and of the other, 3 and 4; the front mounting being the very same as in common gauze. One half of the warp is drawn on the back set 1 and 2, and the other, on the set 3 and 4, two splitfuls on each alternately. But it must always be observed in mountings of this kind, that whatever back set any splitful of warp is drawn on, the first thread is always on the back leaf, and the other on the fore leaf of that set. The heddles of these back leaves are made with eyes, as they both raise and sink the warp occasionally. The warp is taken through the front mounting in the same manner as that of a plain gauze. The treadles 1, 2, and 3, weave the checker at *a*, 1 and 5 the plain cloth at *b*, and 1 and 4 the gauze at *c*. Hence it will appear, that the treadle 1 opens the cross shed over all the warp, this treadle having no connexion with any of the back leaves; and, consequently, it produces one of the sheds in each variety in the specimen, and is pressed down for each alternate shot. The treadle 2 slackens or relieves all the doups from their standards; but that part only of the warp which is drawn on the leaves 1 and 2 is crossed, or rather, returns from the cross to the open state, so as to produce the twist; the other half being converted into the plain shed by the contrary motion of the leaves 3 and 4. The treadle 3 operates on the front mounting in the very same manner as the treadle 2, but exactly reverses the motion of the back leaves, which, consequently, changes the gauze stripe into plain, and the

plain into gauze. When the whole web is woven plain, the upper doup and standard are raised, and the under ones sunk, as in weaving lino; and this is effected by the treadle 5, which is also wrought alternately with the treadle 1, as will appear in the specimen. The treadles 4 and 1, as observed above, convert the whole of the warp into gauze, which is represented at *c*. It is therefore evident, that the weaver, when working with both feet, must keep his left foot on the treadle 1 in all these varieties, which he works alternately with any of the other treadles he may have occasion to employ.

VICTORIES.

By thus combining gauze and plain cloth, in different ways, arise that species of fancy gauze, called victories, which were manufactured some time ago in great quantities and variety. Their most predominant appearance is a number of small gauze spaces, interspersed with plains; sometimes checked by the weft, at others, thrown into small alternate checkers, though not always square. Some of these patterns were woven by one set of gauze mounting and a plain stripe, the gauze parts resembling lino; others, by two sets of gauze mounting, making these small gauze spaces alternate, the plains consisting of three or five shots, succeeded by the key shot, or by a few shots of gauze. These spaces or stripes of gauze were sometimes separated by a cord of coarse yarn, or more frequently by two split-fuls of warp drawn into two adjacent intervals of the reed, while the other intervals were alternately full and empty. These varieties were frequently increased by the addition of another gauze mounting for veining; whence these patterns were called veined victories.

CRAPES.

When three, four, or more sets of gauze mounting are thus employed to form figures of plain on a gauze ground, such patterns have assumed the name of crapes, although the crapes which are manufactured for mournings are of the plain texture, and the crisped appearance is given them in the process of dressing, after they are out of the loom.

Fig. 3 is the plan of a crape, woven with four sets of gauze mounting, although, as formerly observed, only four back sets are necessary. The draught is in regular succession over the back sets of the mounting, and the pattern is that of a diagonal or biassed stripe, gauze and plain alternately, as represented in the Fig. The back sets are marked 1, 2, 3, 4, and the front mounting, as already noticed, is the same as that of a plain gauze. The cross treadle 1, works alternately with the treadles 2, 3, 4, 5, for the crape, with treadle 6 for plain gauze, and with treadle 7 for plain cloth. This will be plain by examining the cording on the back leaves; for, wherever a dot is marked on the fore leaf of any set, and a cross \times , on the back leaf, that set works gauze by that treadle on which they are placed; and where the cross is on the fore leaf, and the dot on the back one, plain cloth is produced.

As in diaper weaving, the utility of the binding plan was shown, in representing all the varieties of the draught and cording on a small scale; so in this, and several other branches of weaving, this contracted plan will be found equally advantageous: for if we suppose one leaf substituted for each set of the present mounting, and the gauze parts represented by raising marks, the draught and cording will be found the very same as the four leafed tweel, No. 1, page 5.

Hence it is evident, that every variety of pattern which has been exhibited in tweeling, lined work, or diaper, may

be produced on crape, by taking such draught and cording for the binding plan, and substituting the gauze sets accordingly.

For Example.—Suppose it were required to weave the pattern, Fig. 30, plate 2, on crape. Here the binding plan will be the same as the draught and cording No. 57, page 41, which is here inserted, that it may be the more readily compared with the crape draught.

BINDING PLAN.

| | | | | | | | | | | | | | | | | | | | | |
|--|--|--|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| | | | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| | | | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| | | | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| | | | 4 | 5 | 6 | 3 | 2 | 1 | | | | | | | | | | | | |

CRAPE PLAN.

| | | | | | | | | | | | | | | | | | | | | |
|-----------|--|--|--|--|--|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|
| | | | | | | x | x | x | | | | | | | | | | | | |
| | | | | | | 0 | 0 | 0 | | | | | | | | | | | | |
| | | | | | | x | x | x | | | | | | | | | | | | |
| | | | | | | 0 | 0 | 0 | | | | | | | | | | | | |
| | | | | | | x | x | x | | | | | | | | | | | | |
| | | | | | | 0 | 0 | 0 | | | | | | | | | | | | |
| | | | | | | x | x | x | | | | | | | | | | | | |
| | | | | | | 0 | 0 | 0 | | | | | | | | | | | | |
| | | | | | | 4 | 5 | 6 | 3 | 2 | 1 | | | | | | | | | |
| CROSS IT. | | | | | | | | | | | | | | | | | | | | |

In this example the gauze parts only are corded, which is effected by placing the sinking mark on the back leaf of each set, and the raising mark on the fore one. The plain

CRAPE PLAN.

| | | | | | | | | | |
|----|---|---|---|---|-----|---|--|--|-----|
| | 0 | 0 | x | x | | | | | |
| | x | x | 0 | 0 | | | | | |
| | x | 0 | 0 | x | | | | | |
| | 0 | x | x | 0 | | | | | |
| | x | x | 0 | 0 | | | | | |
| | 0 | 0 | x | x | | | | | |
| | 0 | x | x | 0 | | | | | |
| | x | 0 | 0 | x | | | | | 4c. |
| 2 | | | | | 3 | 1 | | | |
| 4 | | | | | 5 | | | | |
| 6 | | | | | 7 | | | | |
| 8 | | | | | 9 | | | | |
| 10 | | | | | 11 | | | | |
| 12 | | | | | 13 | | | | |
| 14 | | | | | 4c. | | | | |
| | a | b | c | d | | | | | |

The treading on the treadles *a*, *b*, *c*, *d*, is the same as the draught with the cross treadle pressed down for every second shot.

The draught here, to save room, is only that part of the binding plan, from *a* to *b*.

In these examples, the two leaves of each set are placed together, that the method of cording may be more distinctly pointed out. But it is considered preferable by some to have all the back leaves placed together behind, and all the fore ones in their front. The draught and cording of Fig. 3, Plate 6, with the leaves arranged in this manner, will stand as below.

| | | | | | | | | | |
|-----------|---|---|---|---|--|--|--|--|--|
| | 0 | 0 | x | x | | | | | |
| | 0 | x | x | 0 | | | | | |
| | x | x | 0 | 0 | | | | | |
| | x | 0 | 0 | x | | | | | |
| | x | x | 0 | 0 | | | | | |
| | x | 0 | 0 | x | | | | | |
| | 0 | 0 | x | x | | | | | |
| | 0 | x | x | 0 | | | | | |
| CROSS tr. | 2 | 3 | 4 | 5 | | | | | |

Here it will be observed, that the raising marks on the fore leaves form the exact cording of the common four-leafed tweel, while the sinking cords take the very same form on the back leaves.

TURKEY GAUZE.

This variety of fancy gauze is woven on the same principle, nearly, as crape. In the Turkey gauze, however, there are sometimes three, four, five, and even six threads in one interval of the reed, which are all twisted together in the gauze parts; but when they are spread out in the plain parts, they form a more solid and substantial fabric than can be produced on crape.

Turkey gauze has a very beautiful appearance when woven on silk: for the natural elasticity of this substance allows it to expand, and fill the interstices of the plain parts, while it is easily compressed into a fine transparent fabric by the gauze twist. Cotton yarn, however, does not possess this property in such a high degree as silk; and therefore, the attempts which have been made to introduce it into the cotton manufacture, has not been attended with that success which was to be desired.

Fig. 4, Plate 6, is the plan of a Turkey gauze mounting for two sets, and three threads in the split. The back leaves of one set are numbered 1, 2, 3, and those of the other set, 4, 5, 6. The two front mountings are on the principle explained in section 1st, for omitting one of the doups and standards. The shafts marked *o i*, are the under doup and standard for one set, the upper or back doup and standard being omitted; *a* and *e* are the upper doup and standard for the other set, the under ones being here omitted. When, therefore, the cross shed of the set *o i* is formed, the cross thread is sunk by the back leaf, and raised by the doup and standard on the right of the other two threads. But