(No Model.)

C. COUPLAND.

LOOM FOR WEAVING DOUBLE PILE FABRICS.

No. 294,967. Patented Mar. 11, 1884.

Fig 1

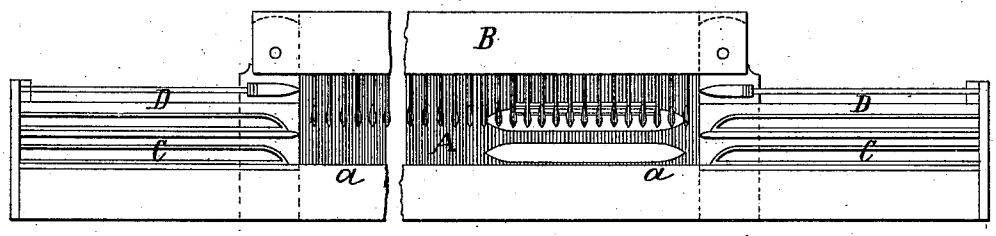


Fig 2

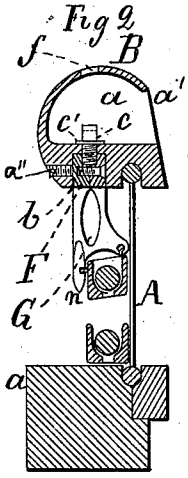


Fig 3

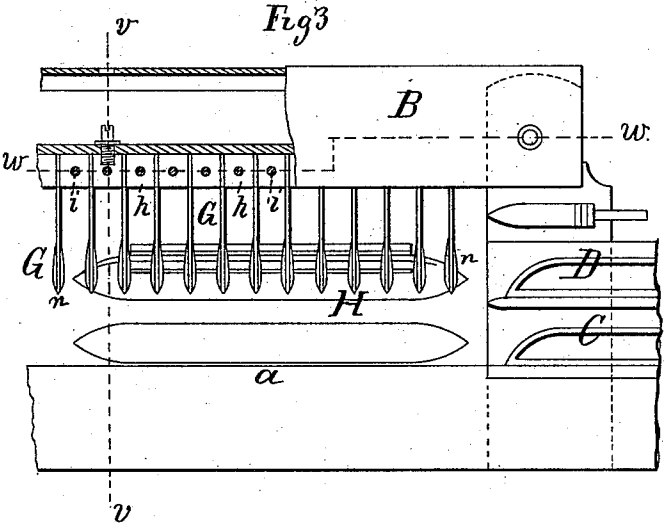


Fig 4

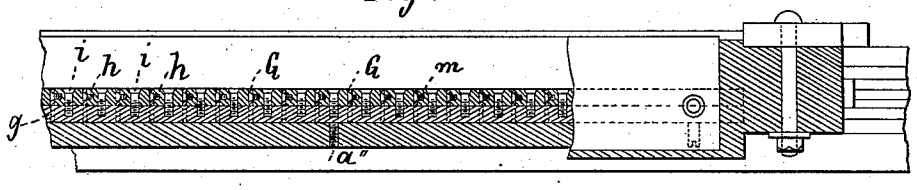


Fig 9

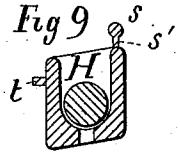


Fig 5

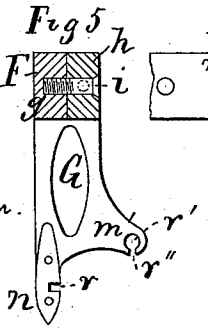


Fig 6

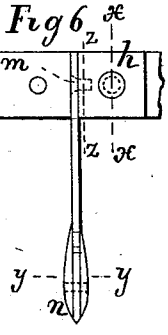


Fig 7

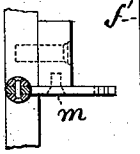
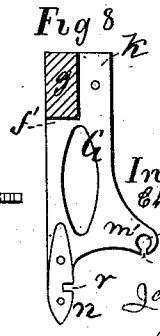


Fig 8



Witnesses
Rudolph Bellman.
Edward A. Hoeley

Inventor
Charles Coupland
per
James Aubitney
Attorney

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

CHARLES COUPLAND, OF SEYMOUR, CONNECTICUT.

LOOM FOR WEAVING DOUBLE PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 294,967, dated March 11, 1884.

Application filed March 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES COUPLAND, of Seymour, in the county of New Haven and State of Connecticut, have invented certain Improvements in Looms for Weaving Double Pile Fabrics, of which the following is a specification.

This invention relates to looms for weaving double pile fabrics, such fabrics being composed of two webs connected by an intermediate pile-warp, which, when severed midway between the warps, furnishes a pile to each of the separated fabrics. In such looms it is requisite that two shuttles should operate—one in the formation of each fabric—and it is desirable that one of these—namely, that employed in the formation of the upper fabric—should traverse the warps thereof without coming in contact with said warps. To insure this it is requisite that there should be provided a suspended raceway for the upper shuttle, so constructed as to support the said shuttle during its flight without interfering with the movements of the warp of the upper fabric.

My invention relates to this class of apparatus; and its object is to provide a raceway which will effectually support the shuttle during its said flight, and which may be adjusted in various ways to fit it for the most effective performance of the work required therefrom, and which will be of a construction strong and durable, and at the same time capable of easy change and repair.

My invention comprises certain novel combinations of parts whereby said objects are effectually secured, as hereinafter described, and pointed out in the claims.

Figure 1 is a front view of part of a lay of a loom. Fig. 2 is a transverse sectional view on a larger scale, taken in a line, *v v*, of Fig. 3. Fig. 3 is a front view and partial vertical longitudinal sectional view of a part of the lay of the loom. Fig. 4 is a horizontal sectional view taken in the line *w w* of Fig. 3. Fig. 5 is a detail sectional view taken in the line *x x* of Fig. 6. Fig. 6 is a detail view, as seen from the front, of certain of the parts represented in Figs. 1, 2, 3, and 5. Fig. 7 is a horizontal sectional view, as seen from beneath, taken in the line *y y* of Fig. 6. Fig. 8 is a sectional view taken in the line *z z* of Fig. 6. Fig. 9 is a detail sectional view of one of the shuttles employed in the practice of my said invention.

A is the reed of a loom, and B is the top rail of the said reed. At the ends of the lay are duplicate shuttle-boxes C D. The lowermost shuttle-boxes, C, are so arranged that the shuttle therefrom will be projected along the lower raceway, *a*, which answers to the usual race of an ordinary loom. The upper shuttle-boxes, D, are arranged to guide their shuttle through the suspended race formed of the pendent fingers or prongs G, hereinafter more fully set forth, the race thus provided being in the same relation to the upper shuttle-boxes, D, as the race *a* is with reference to the lower shuttle-boxes, C, and being designed to carry the shuttle used in forming the upper fabric without permitting said shuttle to come in contact with the warp of said fabric. Suitable pickers or projecting devices, operated in any appropriate manner, are connected with the shuttle-boxes C and D, to simultaneously project the two shuttles along their respective races alternately in opposite directions, as required in the operation of weaving.

The top rail, B, is preferably made of cast metal, and has formed longitudinally therein an internal chamber, *a*, open at the back, as shown at *a'*. Formed longitudinally in the under side of this top rail is a groove, *b*, rectangular in its cross-section, as shown in Fig. 2. Placed in this groove *b* is a bar, F, which in its cross-section corresponds in shape and size with the said groove *b*, so that it may be adjusted bodily up and down therein. This adjustment is provided for by means of two or more set-screws, *c*, which have broad heads *c'*, as shown in Fig. 2, and which, passing down through suitable holes in the bottom of the chamber *a*, are screwed into threaded sockets or nuts formed vertically in the bar F, so that by turning the said set-screws *c*, by means of a suitable wrench passed down through a suitable opening, *f*, fitted upon the squared head of each set-screw, the bar F may be vertically adjusted within the groove *b* and fixed in position by screws *a''*. This bar F is com-

posed of several parts, (more fully represented in Fig. 4,) one of these parts being a flat plate or relatively thin bar, *g*, to one side of which are screwed a longitudinal series of flat blocks, *h*, each of which is firmly screwed to the side of the plate *g* by screws *i*. Each of the blocks *h* has attached to one of the sides a pendent finger or prong, G, the said prong G having an upwardly-projecting tongue, *k*, which is attached to the end of the block by means of a countersunk screw, *m*, that portion of the finger or prong G immediately below the tongue *k* constituting a shoulder, *f'*, which fits snugly against the under side of the plate *g*, as more fully indicated in Fig. 8. It will be seen that, the fingers or prongs G being securely attached to the blocks *h* by the screws *m*, and the said blocks *h* being in their turn firmly attached to the side of the plate *g* by means of screws *i*, the said fingers or prongs G are ranged in line side by side at a distance about equal to the length, or, as it may be termed, the "width," of the blocks *h*, as more fully indicated in Fig. 3. Furthermore, inasmuch as the plate or bar F, composed of the plate *g* and the blocks *h*, is capable of vertical adjustment with reference to the top rail, B, as hereinbefore explained, it follows that the fingers or prongs G are themselves, as a series, vertically adjustable, the object of this invention being to enable the suspended race formed by the lower ends of said fingers or prongs G, as hereinafter explained, to be duly adjusted in relation with the path of the upper shuttle as the same is thrown to and fro from one to the other of the upper shuttle-boxes, D. The lower end of each of the fingers or prongs G is provided with an elongated bulb-shaped vertical spur, *n*, the elongated bulb shape of said spur from its rounded contour preventing the yarns of the upper warp from catching thereon during the operation of the weaving. In the rearmost side of this vertical spur *n* is formed a horizontal groove or notch, *r*.

Projecting backward from the lower part of each of the fingers or prongs G is an arm, *m'*, in which, in a parallel direction with that of the notch *r*, is formed an opening, *r'*, from which to the lower outer surface of said arm *m'* extends a relatively narrow slit, *r''*. The fingers or prongs G being placed side by side, with their flat lateral surfaces parallel, and at substantially regular distances apart, as hereinbefore explained, it follows that the notches *r* of the said fingers or prongs will be substantially coincident or in the same horizontal line, and that in like manner the openings *r'*, with their slits *r''*, will be coincident or in substantially the same line.

The shuttle H of the upper shuttle-boxes has, as represented in Fig. 9, at one of its sides a rib, *s*, which in diameter and cross-section corresponds in size and shape with that of the openings *r'*, and which is longitudinally connected with the adjacent rear edge of the shuttle H by a narrow neck or strip, *s'*, which in diameter and shape corresponds, substantially, with that of the slit *r''*. Provided longitudinally at the front of the shuttle H is a spline, *t*, which in size and cross-section corresponds, substantially, to that of the notches *r*, the said parts and the shuttle H itself being so proportioned that while the rib *s* may pass within and through the opening *r'*, the spline *t* may pass within and through the notches *r*. The shuttle H and its boxes D being arranged in due relation with the race thus provided by the lower ends of the fingers or prongs G, the said shuttle in its flight from one of the boxes D to the other is suspended out of contact with the warp, inasmuch as the rear of the shuttle is supported by the passage of the rib *s* through the openings *r'*, while the front of the shuttle is supported by the passage of the spline *t* in and through the notches *r*, what may be termed a "skeleton race" being thus provided for the support of the said upper shuttle, H, during its flight.

What I claim as my invention is—

1. The combination, with the reed and lay of a loom, and upper and lower shuttle-boxes at each end of the lay, of a fixed upper skeleton raceway composed of vertical prongs, having coincident notches arranged in a horizontal series, an upper shuttle having a part or portion corresponding in shape to the said coincident notches, a lower raceway, and a lower shuttle, whereby provision is made for simultaneously weaving duplicate fabrics without rubbing contact of the upper shuttle with the warp, substantially as herein set forth.

2. The combination, with the reed and lay of a loom, of a top rail, B, having an internal longitudinal chamber, *a*, and in its under side a longitudinal groove, *b*, a bar, F, carrying a skeleton raceway, and adjusting-screws *c*, for vertically adjusting said bar with reference to the top rail, all substantially as and for the purpose herein set forth.

3. The combination, with the top rail, the lay, and reed of a loom, of the skeleton race composed of vertical fingers or prongs G, having the notches *r*, openings *r'*, and slits *r''*, and a shuttle constructed with a spline, *t*, and rib *s*, whereby the shuttle is supported during its flight without contact with the adjacent warp, substantially as and for the purpose herein set forth.

4. The combination, with the reed and lay of a loom, of the top rail, B, having the longitudinal chamber *a* and longitudinal opening *a'*, and constructed with a longitudinal groove, *b*, in its under side, a bar, F, composed of the plate *g*, and blocks *h*, and screws *i*, the fingers or prongs G, arranged to receive and suspend a shuttle at the lower ends during its flight, and the screws *m*, all substantially as and for the purpose herein set forth.

5. The combination, with the reed and lay of a loom, of a fixed upper skeleton raceway composed of vertical prongs constructed with notches *r*, openings *r'*, and elongated bulb-shaped spurs *n*, an upper shuttle constructed with the rib *s* and spline *t*, a lower raceway, a lower shuttle, and upper and lower shuttle-boxes, the whole arranged for joint use and operation, substantially as and for the purpose herein set forth.

CHARLES COUPLAND.

Witnesses:
S. H. CANFIELD,
S. HART CULVER.