

(No Model.)

5 Sheets—Sheet 1.

S. BARNWELL.
SMALL WARE LOOM.

No. 556,241.

Patented Mar. 10, 1896.

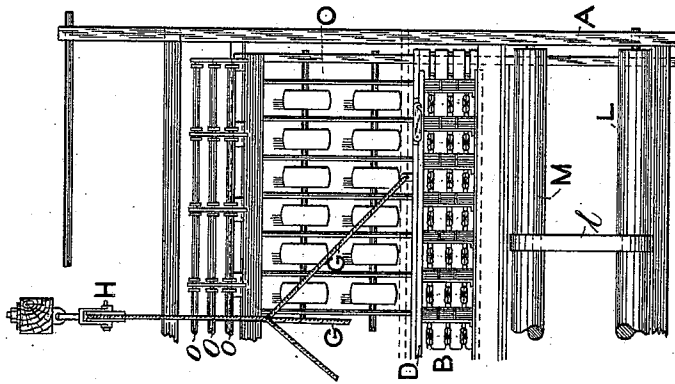


Fig. 1.

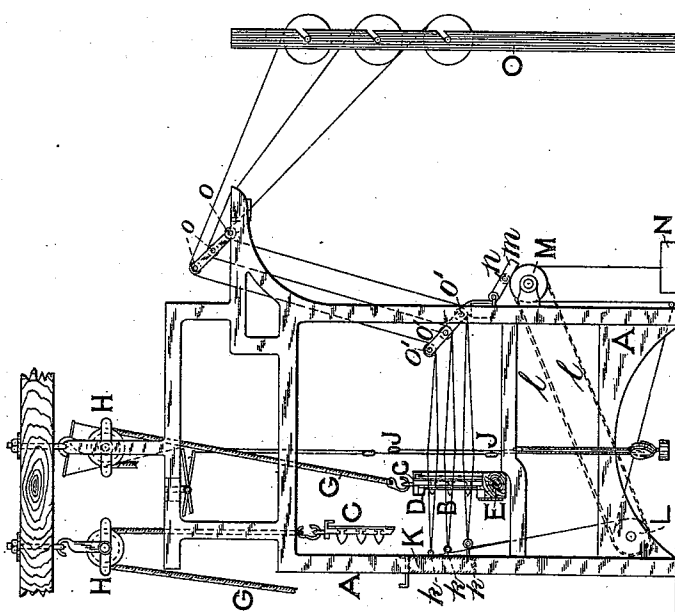


FIG. 2.

Witnesses
George Baumann
A. C. Connor

Inventor
Stephen Barnwell
By his attorneys
Howson and Howson

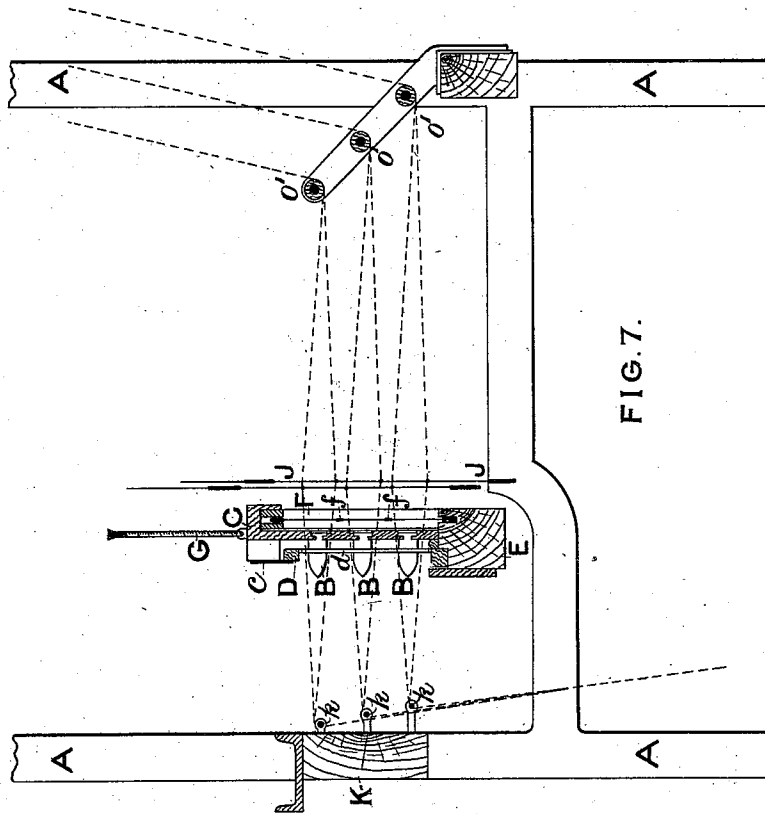
(No Model.)

5 Sheets—Sheet 3.

S. BARNWELL.
SMALL WARE LOOM.

No. 556,241.

Patented Mar. 10, 1896.



Witnesses
George Baumann
J. C. Connor

Inventor
Stephen Barnwell
By his Attorneys
Horton and Horton

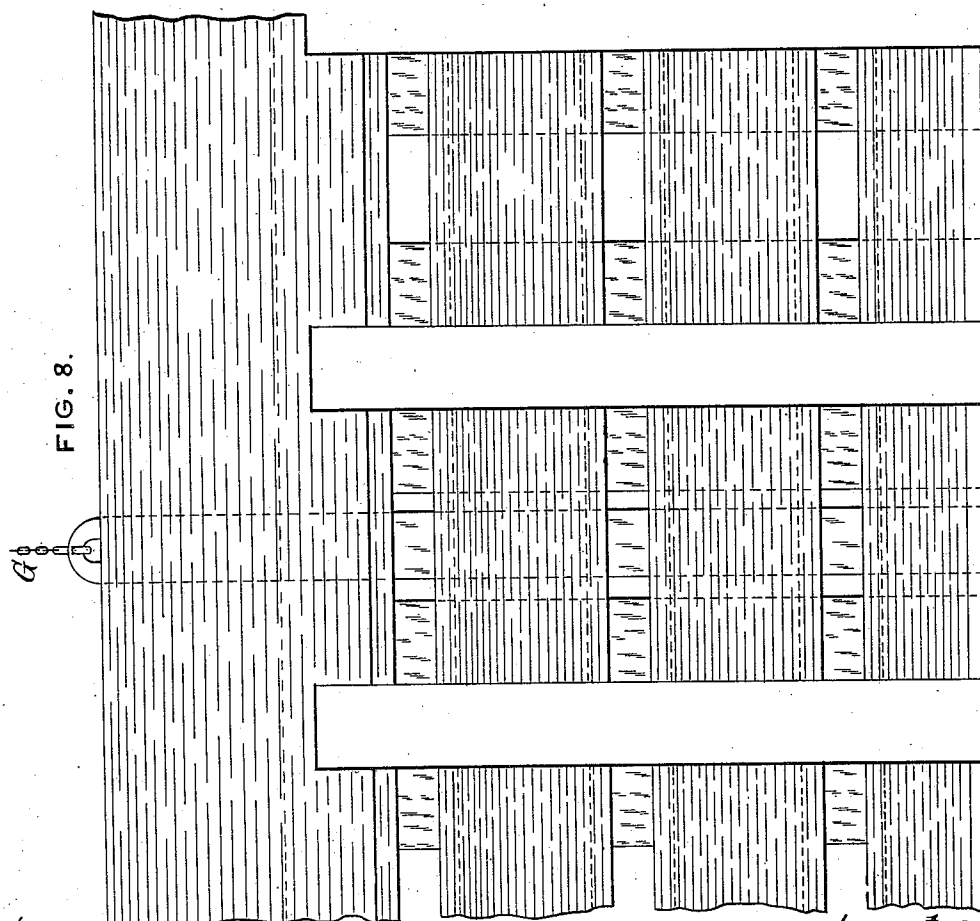
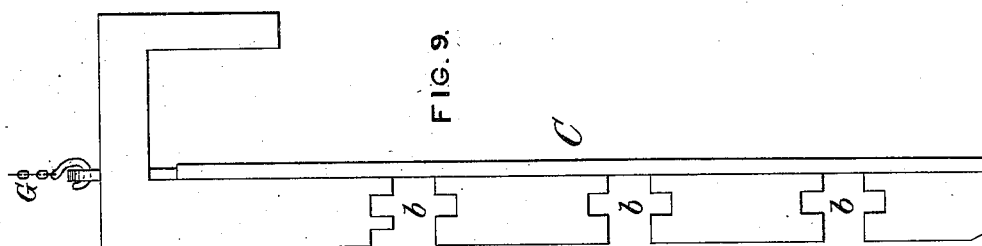
(No Model.)

5 Sheets—Sheet 4.

S. BARNWELL.
SMALL WARE LOOM.

No. 556,241.

Patented Mar. 10, 1896.



Witnesses
George Baumann
J. C. Connor

Inventor
Stephen Barnwell
By his Attorneys
Horton T. Hemen

(No Model.)

5 Sheets—Sheet 5.

S. BARNWELL.
SMALL WARE LOOM.

No. 556,241.

Patented Mar. 10, 1896.

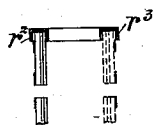


FIG. II.

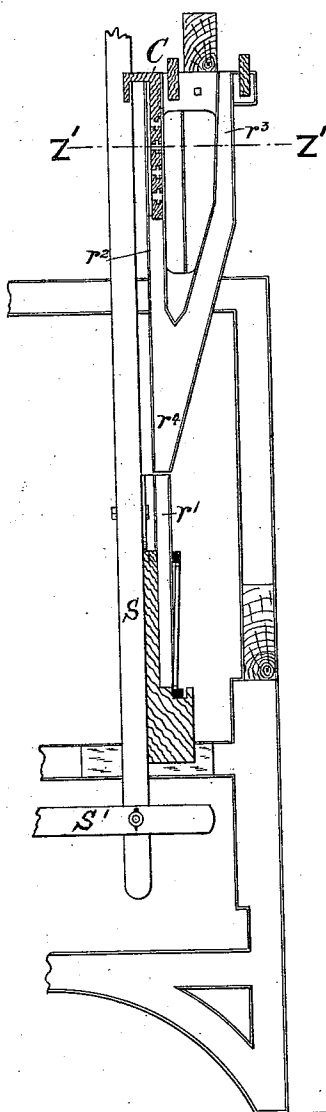


FIG. 10.

Witnesses
George Baumann
J. C. Connor

Inventor
Stephen Barnwell
By his Attorneys
Horton & Hinson.

UNITED STATES PATENT OFFICE.

STEPHEN BARNWELL, OF MANCHESTER, ENGLAND, ASSIGNOR TO THE
BARNWELL MACHINE COMPANY, LIMITED, OF SAME PLACE.

SMALL-WARE LOOM.

SPECIFICATION forming part of Letters Patent No. 556,241, dated March 10, 1896.

Application filed February 12, 1895. Serial No. 538,111. (No model.) Patented in England February 25, 1892, No. 3,711, and in Germany March 18, 1893, No. 73,070.

To all whom it may concern:

Be it known that I, STEPHEN BARNWELL, a subject of the Queen of Great Britain and Ireland, and a resident of 118 Everton Road, Manchester, county of Lancaster, England, have invented certain Improvements in Small-Ware Looms, (for which I have obtained a British patent, No. 3,711, dated February 25, 1892, and a German patent, No. 73,070, dated March 18, 1893,) of which the following is a specification.

This invention relates to that class of looms in which ribbons, tapes, and similar narrow articles are woven and known as "small-ware looms," and is designed with the object of increasing the production of the loom by providing means whereby two, three, or more rows of separate and continuous fabrics can be woven superimposed or one above the other at the same time, instead of or in addition to a single fabric, such as at present produced, so that a greater amount of work may be turned out with the same expenditure of labor.

The invention consists, essentially, in constructing the loom with a combination of parts arranged to receive two, three, or more sets or rows of warp-threads drawn through to form as many rows of sheds, one above the other; two, three, or more rows or sets of shuttles weaving independent fabrics; a sley or reed to separate or divide the warps and beat up the wefts; a part of the batten which carries the shuttles movable or detachable, and the healds constructed to carry the warps in two or more sheds, one above the other. It will be fully described with reference to the accompanying drawings, in which sufficient of a small-ware loom is shown to illustrate my invention.

Figure 1 is a front elevation of one end of a loom with the breast-piece removed. Fig. 2 is an end elevation of the same; Fig. 3, a front elevation of part of the sley or batten, on enlarged scale; Fig. 4, a transverse sectional elevation of Fig. 3 on the line xx , as seen in the direction of the arrow. Fig. 5 is a sectional plan of same on the line yy of Fig. 3. Fig. 6 is a view showing a single heald or leash. Fig. 7 is an enlarged sectional view

of some of the parts shown in Fig. 2. Fig. 8 is a front view of part of the removable part of the batten. Fig. 9 is an end view of Fig. 8. Fig. 10 is an elevation, as seen from the inside of the loom, of the guides for the removable part of the batten. Fig. 11 is a section through line $Z'Z'$ of Fig. 10.

The framework A, which supports the various parts of the loom, the shuttles B, and the mechanism whereby the healds and other parts of the loom are actuated, are of ordinary construction, and consequently the crank, shaft-cranks, cams, and mechanism at the end of frame for driving the shuttles are not shown in the drawings.

The batten or sley is constructed with two, three or more (preferably three) shuttle-races b to receive two, three or more sets or rows of shuttles B, placed one above the other, the number of sets of warps or sheds corresponding therewith, all the shuttles being propelled forward through their respective sheds simultaneously. The batten is further constructed in three separate parts: a removable part C in the center, which carries or supports the shuttles B, and in which the shuttle-races b are formed in rows one above the other; a front sliding frame, D, with upright arms or brackets d , which engage with the shuttles and propel them backward and forward through the sheds, and a fixed frame E at the back, which carries or to which the reeds F are affixed.

The removable part C of the batten can be lifted up and removed and replaced without disturbing or disarranging the other parts, the bottom part being left open so as not to come in contact with the warps when being removed from or placed in position. I prefer to supply each loom with two of these removable shuttle-frames or parts and attach to each a cord G, whereby they can be lifted up into a position above the operative parts of the loom, so that when the quills or pins in one lot of shuttles become empty the removable part carrying the shuttles can be lifted out of the batten and another one with full shuttles can be inserted to take its place, thus obviating any lengthy stoppage of the loom to supply fresh quills, the empty quills

being removed and replaced while the shuttles are out of operation. The cords G pass over pulleys H, and I prefer to place guides at each end of the framing for guiding the movable part C when being raised and lowered. These guides, Figs. 10 and 11, consist of channels, one, r' , of which is fixed at each end of the batten and swings therewith. The batten is operated in the usual well-known way. For instance, it may be attached to swinging arms S, caused to oscillate by links S' connected to a crank-shaft. Fixed to the inside of each side frame of the loom is a frame containing two channels r^2 r^3 opening into each other and having a common outlet at r^4 , which is in line with the top of the guide-channel r' when the batten is in its foremost position, at which point the removable part C may be raised or lowered. It will of course be understood that one of the movable parts C is lifted into whichever of the channels r^2 or r^3 is vacant before the other is brought down.

The sliding frame D is actuated at one or both ends by the usual mechanism and is held in position when in operation by the pivoted catches c. The catches c are removed and the frame D drawn forward when it is desired to remove and replace the part C.

The reed F is divided into two, three or more divisions corresponding with the number of superimposed rows of shuttles and sheds by narrow bars f , extending across the dents, for the purpose of dividing the different sets of warps and also of strengthening the reed or rendering it sufficiently strong to beat up weft in the several sheds at the same time.

The healds J are each formed with two or more eyes j , so that two or more rows of warp-threads are carried by each, one above the other. Each heald thus changes the three superimposed sheds at the one time.

The breast-piece K is provided with two, three, or more wires k , over one of which each of the separate fabrics passes when woven. The woven fabrics pass from the wires k over a roller L and from thence over a second roller M to a receiving-box N. The roller M is driven from the roller L by the strap l , and the fabrics are held in contact with the roller M by pivoted levers or weights m , each provided with a pulley or runner n .

The rolls of warps I prefer to mount in a creel O at the back of the loom, and pass the threads forward over the guide-rollers oo' , as shown. Instead of placing the creel O at the back of the loom, it may be placed in any other convenient position.

The invention may be applied with small-ware looms with any ordinary driving mech-

anism for the shuttles, such as rack and pinion, peg-shot, and other descriptions of motions commonly employed in this class of loom.

I wish it to be understood that I am well aware that two or more sets of superimposed shuttles with the usual rise-and-fall action operated by jacquards have been employed for weaving fabrics with colors or patterns and also for weaving ladder-tapes for Venetian blinds, but such do not constitute any part of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a small-ware loom, the combination of a sley or batten having a horizontally-sliding frame for simultaneously operating two or more vertically-superposed lines of shuttles with a vertically-withdrawable frame resting freely in guides and carrying all the shuttles, whereby all the shuttles of the loom can be simultaneously and collectively withdrawn and another similar shuttle-frame be dropped into the same guides, reeds divided into two or more vertically-superposed compartments, healds, the separate leashes of which have two or more eyes each, and a creel for supporting two or more rows or sets of vertically-superposed warp-threads, substantially as described, for the purpose of weaving simultaneously two or more separate and continuous fabrics, one vertically over the other.

2. In a small-ware loom, a sley or batten for simultaneously operating two or more vertically-superposed rows of shuttles, a vertically-displaceable shuttle-frame carrying two or more vertically-superposed shuttle-races, guides fixed to each end of, and swinging with, the batten, in which guides the shuttle-frame freely rests, with frames provided with two guide-grooves opening into each other and having a common outlet in line with the said guides on the batten, for facilitating the replacement of one shuttle-frame for another, substantially as set forth.

3. In a small-ware loom, the combination with a sley or batten of a detachable vertically-withdrawable shuttle-frame common to all the shuttles, guides in the batten for holding the shuttle-frame and corresponding guides in the loom-frame for receiving the shuttle-frame when lifted up and for holding a second shuttle-frame to replace the first one, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

STEPHEN BARNWELL.

Witnesses:

JOHN HALL,
JOSEPH BENTON.