

W. TALBOT.

WARP OPERATING MECHANISM FOR CROSS WEAVING.

No. 453,714

Patented June 9, 1891.

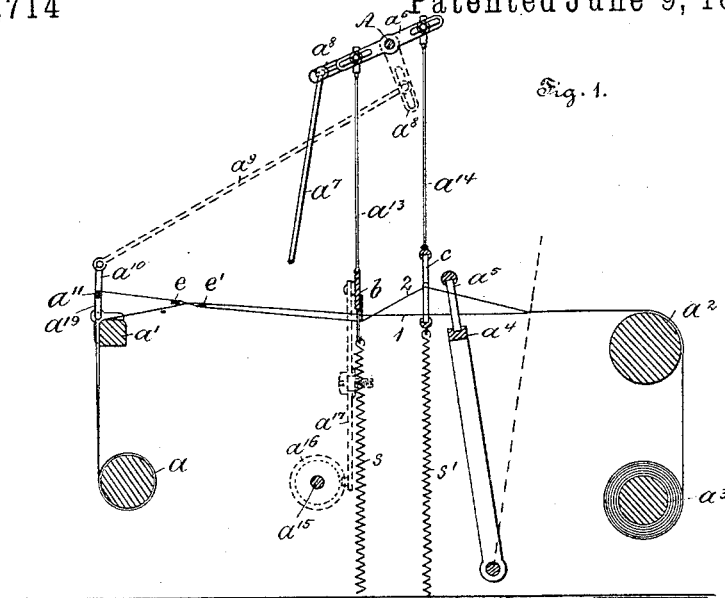


Fig. 1.

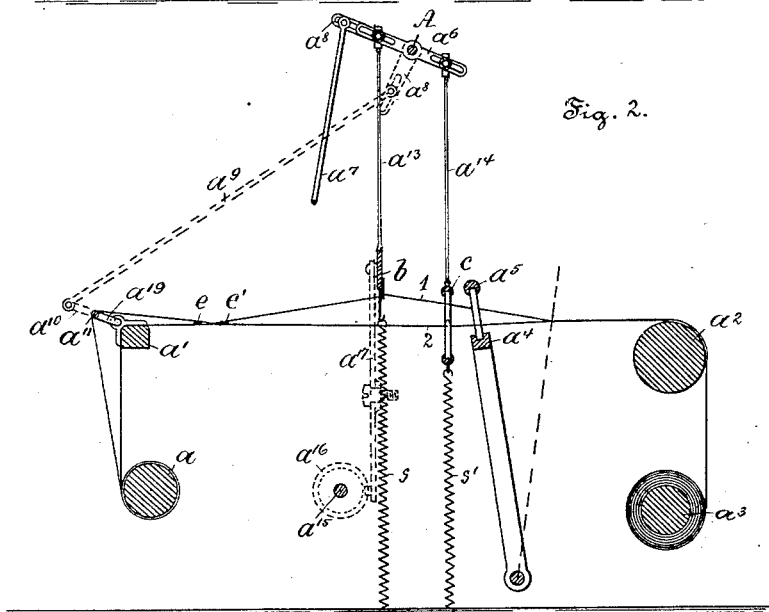


Fig. 2.

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

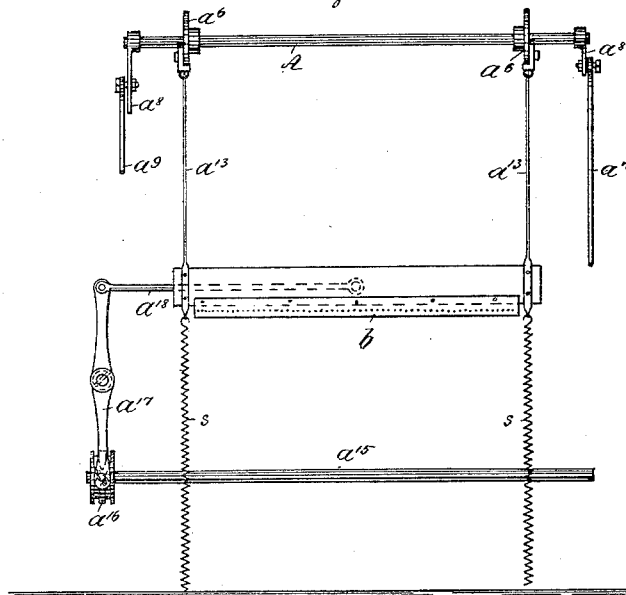


Fig. 4

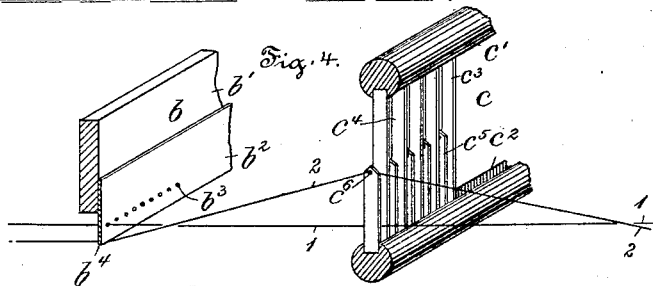
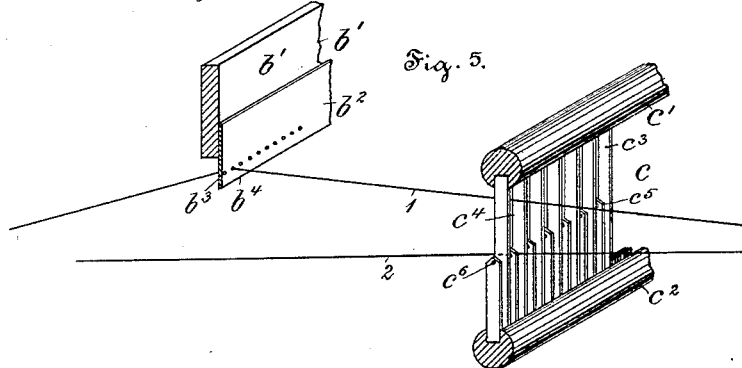


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM TALBOT, OF PHILADELPHIA, PENNSYLVANIA.

WARP-OPERATING MECHANISM FOR CROSS-WEAVING.

SPECIFICATION forming part of Letters Patent No. 453,714, dated June 9, 1891.

Application filed November 6, 1890. Serial No. 370,499. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM TALBOT, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Warp-Operating Mechanism for Cross-Weaving, of which the following is a specification.

My invention relates to simple, durable, and efficient apparatus for rapidly weaving fine threads into a gauze fabric, especially adapted for use in the production of chenille, yet nevertheless applicable to other purposes.

It is well known that in plain weaving the threads of the warp, whether raised or sunk alternately or at intervals, remain always parallel to each other and without crossing; but in gauze-weaving the two threads of warp which pass between the same dents of the reed are crossed over each other and are twined to the right and to the left alternately, like a cord, and each pick of weft preserves the twine which the warp has received. A species of yarn which is commonly called "chenille," and which is well adapted for use as wefts in the rug, carpet, and shawl manufacture, is prepared from a gauze fabric woven in the manner above described by cutting the same into strips (by means of a suitable machine) in the center between the dentfuls of warp.

Heretofore it has been customary in gauze-weaving to employ a harness comprising positively-actuated leaves and other leaves which were lifted or sunk by the warp and to inter-loop the heddles of these leaves in order to cross the two threads of the warp. Although excellent gauze fabrics were produced by the employment of such leaves, still the harness was difficult and expensive to mount, and in use the interlooped heddles constantly rubbed upon one another and soon wore out. Many attempts have been made to improve upon and simplify the above-described mounting by dispensing with the crossed or looped heddles and substituting other appliances therefor—for example, two oppositely-disposed combs having eyes formed in the extremities of the teeth thereof for the reception of the warp-threads in lieu of the crossed heddles. In use these combs were lifted and sunk in

the same manner as the leaves of a harness are usually lifted and sunk, and one of these combs was also intermittently shifted cross-wise of the loom, in order to lift the threads which passed through the eyes thereof from one dent of the other comb into the next dent thereof and back again to the first dent, thereby crossing the warp-threads. In practice beneficial results were attained by the employment of such combs in weaving coarse threads into open fabrics; but it was very difficult even at a low rate of speed and impossible at a high rate of speed to prevent the oscillating comb from being shifted so far that certain of the warp-threads were lifted from one dent of the other comb into a second or third dent thereof, instead of being lifted into the adjacent dent, whereby the warp was tangled and broken. Moreover, the teeth of one of these combs were necessarily plunged into a portion of the warp at each operation of the loom, thereby tending to break and otherwise injure the threads thereof. In order to prevent the threads from being lifted into the wrong dents when one of the combs was accidentally shifted too far, it has been customary to combine the other comb with a reed in such manner that the teeth of the comb were located in the dents of the reed. Of course the speed of the loom could be somewhat increased when such a combined reed and comb was employed; but the teeth of the other comb were plunged into a portion of the warp in the manner above described and broke and otherwise injured the latter unless it was composed of coarse and strong yarn and unless the loom was run at a low rate of speed. In my invention the comb is replaced by a shifting-bar provided with eyes and having a smooth lower edge, and this shifting-bar is employed in connection with a combined reed and comb, as is hereinafter fully described. The warp is divided into two portions in the usual manner, and one of these portions is led in beneath the lower edge of the shifting bar and through the eyes of the teeth of the combined comb and reed and the other portion is led in through the eyes of the shifting-bar and through the dents of the combined reed and comb, so that the edge of the shifting-bar contacts with a portion of the warp and depresses the same without breaking or otherwise dis-

turbing the threads thereof in contradistinction to the undesirable effects produced by repeatedly plunging the teeth of a comb into the warp. Consequently in my invention
5 very fine threads may be advantageously employed and the loom may be driven as rapidly as requirements demand.

The principal objects of the present invention are, first, to dispense with the employment of crossed or looped heddles and to obviate the disadvantages incident to their use, and, second, to provide simple, durable, and efficient mechanism for rapidly weaving fine threads into a gauze fabric without breaking
15 or otherwise injuring the warp.

My invention consists of the improvements hereinafter described, and particularly pointed out in the claims.

The nature and characteristic features of the invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a transverse section of a part
25 of loom embodying features of my invention, and provided with warp-tension-controlling mechanism, and showing, also, one portion of the warp depressed by means of the shifting-bar, while the other portion of the warp is
30 slackened by said warp-tension-controlling mechanism and elevated by a combined reed and comb. Fig. 2 is a similar view showing the shifting-bar lifted and a portion of the warp tightened and sunk by the combined
35 reed and comb. Fig. 3 is a front elevation of the loom, showing mechanism for reciprocating the shifting-bar transversely of the loom; and Figs. 4 and 5 are perspective views, on an enlarged scale, of portions of the shifting-bar and combined reed and comb, showing
40 the relative positions of the threads during the operations of the loom.

In the drawings, a is a yarn-beam.

a' is a whip-beam, over which a portion of
45 the warp-yarn passes in its progress through the loom.

a^2 is a cloth-roller.

a^3 is a cloth-beam, upon which the finished fabric is wound.

50 e and e' are lease-rods for separating the warp into two portions.

a^4 and a^5 are the lay and batten-reed for striking in or beating up each successive pick.

55 a^6 are working-beams, keyed or otherwise secured to a shaft A, provided at the respective extremities thereof with arms a^8 . This shaft A is oscillated by means of a link a^7 , pivotally attached to one of the arms a^8 , or in any other preferred manner.

60 a^9 is a link attached at its respective extremities to the other arm a^8 and to an arm a^{10} , pivotally attached to the whip-beam a' .

65 a^{11} is a whip-roller supported by the arm a^{10} and by an arm a^{19} , so that the oscillations of the beam a^6 cause the whip-roller a^{11} to be shifted back and forth, in order to tighten

and loosen the portion of the warp which passes over it. The shifting-bar b is attached to one arm of the working-beam a^6
70 by means of cords or rods a^{13} , and the combined reed and comb c is attached to the other arm of the working-beam by means of a rod or cord a^{14} , so that when the working-beam a^6 is turned—for example, as illustrated
75 in Fig. 1—the combined reed and comb c is elevated and the shifting-bar b is sunk, and when the working-beam a^6 is turned in the other direction, Fig. 2, the shifting-bar b is raised and the combined reed and comb c is
80 sunk.

s and s' are spiral springs for drawing the shifting-bar b and the combined reed and comb c downward.

85 a^{15} , Fig. 3, is a positively-driven shaft provided with a double-grooved cam a^{16} .

85 a^{17} is an arm pivotally supported at or near its center, and having one extremity thereof in engagement with the cam a^{16} and the other extremity thereof connected with
90 the shifting-bar b by means of a link a^{18} , so that the revolutions of the shaft a^{15} cause the shifting-bar b to be reciprocated transversely of the loom, and the number of such reciprocations may be increased or diminished
95 by varying the speed of rotation of the shaft a^{15} .

In Figs. 4 and 5 the shifting-bar b is preferably composed of a strip of wood b' , provided with a depending metal strip b^2 . This metal
100 strip b^2 is provided with a series of eyes b^3 , adapted for the reception of a portion of the warp, and with a smooth and slightly-rounded lower edge b^4 , adapted to contact with and depress the other portions of the warp without
105 breaking or otherwise injuring the same.

The combined comb and reed c is composed of upper and lower capes c' and c^2 , with cross-bars c^3 connecting said capes and forming
110 dents c^4 , adapted for the reception of the warps, which pass through the eyes b^3 of the shifting-bar b .

110 c^5 are teeth located in the dents c^4 and extending upward to the middle thereof.

115 c^6 are eyes formed in the extremities of the teeth c^5 and adapted for the reception of the portion of the warp which passes beneath the shifting-bar b .

In use the warp is divided into two portions, and the threads 1 of one portion are
120 led in over the stationary whip-beam a' through the eyes b^3 of the shifting-bar b and through the dents c^4 of the combined reed and comb c . The threads 2 of the other portion of the warp are led in over the adjustable
125 whip-roller a^{11} , beneath the smooth edge b^4 of the shifting-bar b , and through the eyes c^6 of the teeth of the combined reed and comb.

The mode of operation of the mechanism hereinbefore described is as follows: Referring to Figs. 1 and 4, the whip-roller a^{11} is
130 shifted toward the right, the shifting-bar b is sunk, and the combined reed and comb c is elevated, (by oscillating the working-beam a^6

or in any other preferred manner,) so that the threads 1 occupy positions behind the teeth c^5 , Fig. 4, of the combined reed and comb and near the lower cape c^2 and rods c^3 thereof, and the threads 2 are slackened and depressed by the lower edge b^4 of the shifting-bar b and lifted by the teeth c^5 . One or more wefts or woofs are then thrown into the shed and beaten up in the usual manner. The combined reed and comb c is then sunk and the whip-roller a^{11} is shifted to the left, Figs. 2 and 5, and the shifting-bar b is lifted, Fig. 5, by means of the working-beam a^5 in any preferred manner, so that the threads 2 are tightened and sunk and the threads 1 are lifted. One or more wefts or woofs are then thrown in in the usual manner and the shifting-bar b is shifted toward the left Fig. 3, by means of the shaft a^{15} , cam a^{16} , and bar a^{17} , or in any other preferred manner, so that the threads 1 are crossed over the threads 2, and will occupy positions in front of the teeth c^5 and near the lower cape c^2 and bars c^3 when the shifting-bar b is again lowered. By a repetition of the above-described operations the process of weaving is made continuous, and may be conducted as rapidly as required, for the reason that the shifting-bar b does not tend to break the threads of the warp, and for other reasons, which will be readily understood by those skilled in the art of weaving without further description.

It is obvious that modifications may be made as to some of the details of the machine hereinbefore described without departing from the spirit of the invention, and hence I do not limit myself to the exact construction hereinbefore described, and illustrated in the accompanying drawings.

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

1. The combination, with a gauze-loom provided with warp-slackening mechanism, of a shifting-bar having a straight lower edge pro-

vided with eyes, a comb, mechanism for lifting and sinking the comb, and means for reciprocating the bar transversely of the loom, substantially as and for the purposes set forth.

2. The combination, in a loom provided with automatic warp-slackening mechanism, of a shifting-bar provided with eyes, a comb provided with eyes, mechanism for lifting and sinking said comb and bar, and means for shifting said bar transversely of the loom, substantially as and for the purposes set forth.

3. The combination, in a loom having warp-tension-adjusting mechanism, of a shifting-bar provided with eyes, a combined comb and reed, mechanism for alternately lifting and sinking said shifting-bar and combined comb and reed, and means for shifting said bar transversely of the loom, substantially as and for the purposes set forth.

4. The combination, in a loom provided with a fixed whip-beam and an adjustable whip-roller, of a shifting-bar provided with eyes, a comb provided with teeth having eyes therein, mechanism for alternately lifting and sinking said bar and comb, and means for shifting said bar transversely of the loom, substantially as and for the purposes set forth.

5. The combination, in a loom provided with a fixed whip-beam and an adjustable whip-roller, of a shifting-bar having a smooth lower edge and provided with eyes, a combined reed and comb mechanism for lifting and sinking said combined reed and comb and said shifting-bar, and means for shifting said bar transversely of the loom, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

WILLIAM TALBOT.

Witnesses:

GEO. W. REED,
HERMANN BORMANN.