(No Model.)

2 Sheets—Sheet 1.

W. TALBOT.

LOOM.

No. 457,411. Patented Aug. 11, 1891.

Fig. 1.

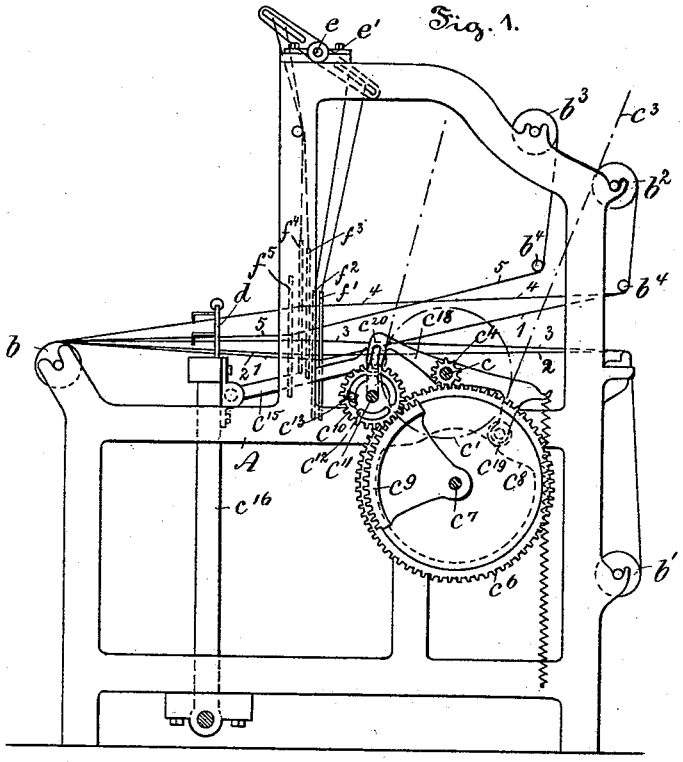
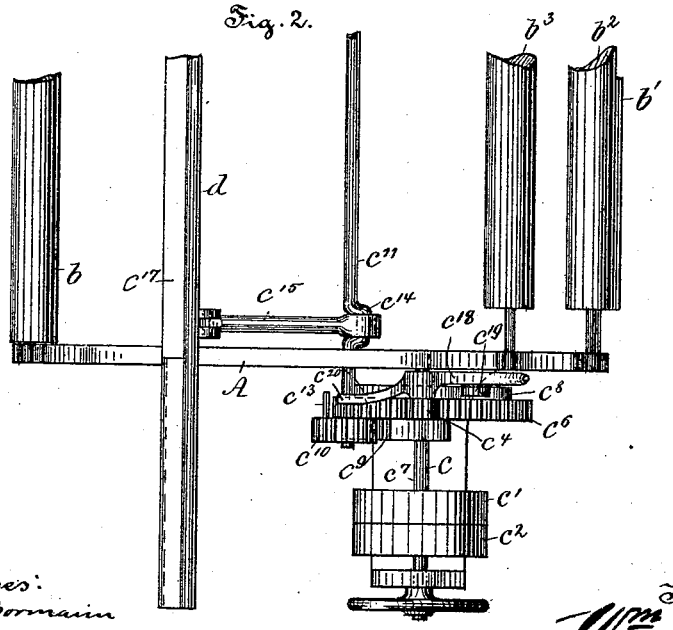


Fig. 2.



Witnesses:
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Richard C. Maxwell.

Inventor:
Wm Talbot,
by J. Walter Douglass.
Att'y.

(No Model.) 2 Sheets—Sheet 2

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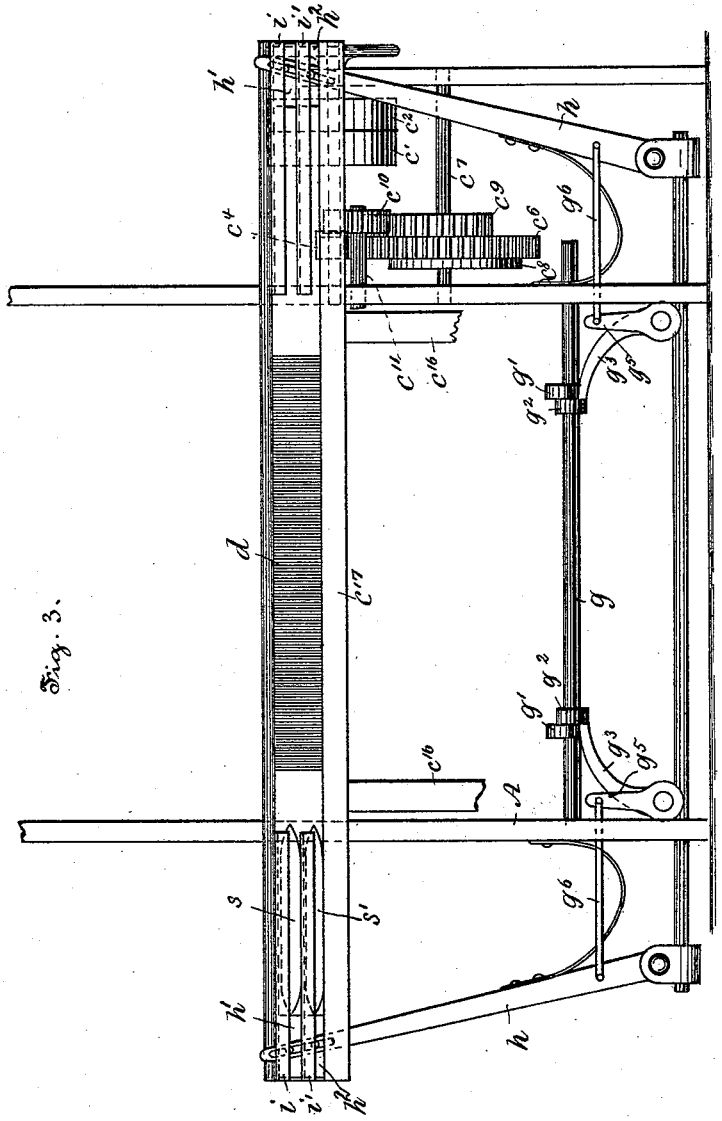

Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM TALBOT, OF PHILADELPHIA, PENNSYLVANIA.

LOOM.

SPECIFICATION forming part of Letters Patent No. 457,411, dated August 11, 1891.

Application filed November 6, 1890. Serial No. 370,501. (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 Looms, of which the following is a specification.

My invention relates to apparatus for producing an inexpensive and attractive woven fabric adapted for carpets and rugs, yet nevertheless applicable to other somewhat analogous purposes.

The principal object of my invention is to provide efficient apparatus for effecting plain weaving especially adapted for the production of a fabric constituting a cheap and acceptable substitute for such costly fabrics as are usually employed for the manufacture of carpets, rugs, and like articles. For example, a fabric having ground wefts and warps composed of jute and face wefts comprising plain or figured chenille or yarn, with binding-warps tying said face and ground wefts together at every pick, and either with or without stuffing warps or floats separating the ground and face wefts.

My invention consists in employing warps in four divisions or half-gangs, two for the ground wefts and two for binding the ground and face wefts, simultaneously lifting one division of the ground warps for the formation of a ground web and one division of the binding-warps for tying the face and ground wefts together, introducing ground and face wefts simultaneously or otherwise, and manipulating said face wefts for the production of the pattern, then lifting the other two divisions of the warps and continuously introducing floats between said web and face wefts; but the introduction of the floats may, if preferred, be dispensed with.

My invention further consists in providing mechanism for intermittently reciprocating the reed or lay of the loom in such manner as to afford ample time for the weaver or operator to manipulate the figured wefts according to requirements of the pattern without the necessity of stopping the loom.

My invention further consists in providing means for lifting the warps, so as to form two superposed sheds, and in also providing mechanism for simultaneously throwing a shuttle into each of said sheds in order to introduce a shot of face weft and a shot of ground weft; and my invention further consists of the improvements hereinafter described and claimed.

The nature and characteristic features of my 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 side elevation of a loom provided with improved mechanism for intermittently oscillating the lay and reed to permit of the manipulation of the face wefts according to requirements of the pattern. Fig. 2 is a top or plan view of Fig. 1; and Fig. 3 is a front elevation of Fig. 1, showing parts of the loom removed and illustrating picker mechanism for driving two shuttles, the one above the other, in the same direction and at the same time across the lay.

In the drawings, A is the frame of the loom.

b is a breast-beam over which the cloth passes in its progress to a cloth-roller. (Not shown.)

b', b^2, and b^3 are respectively yarn-beams adapted for the reception of ground, binding, and stuffing warps.

b^4 are whip-rollers over which the warps are led into the harness.

c is a shaft provided with a fast pulley c' and a loose pulley c^2, which are respectively driven by means of a belt c^3 or in any other preferred manner.

c^4 is a spur-wheel or pinion keyed to the shaft *c* and meshing with a spur-wheel c^6, loosely mounted on a counter-shaft c^7.

c^8 is a cam-wheel adapted to run loose on the counter-shaft c^7. This cam-wheel c^8 is attached to or formed integral with the spur-wheel c^6, for a purpose to be presently set forth.

c^9 is a toothed sector attached to or made part of the spur-wheel c^6 and adapted to mesh with a pinion c^{10}. This pinion c^{10} is keyed or otherwise attached to a crank-shaft c^{11} and is provided with slots c^{12}, adapted for the reception of an adjustable tooth or pin c^{13}.

c^{14} is a crank-arm formed upon the shaft c^{11}.

c^{15} is a link pivotally connected at the respective extremities to the crank-arm c^{14} and to the swords c^{16} of the lay c^{17}.

c^{18} is a spring-actuated detent loosely mounted on the shaft c and provided at one extremity with a roller c^{19}, engaging with the cam c^8, and at the opposite extremity with a jaw c^{20} for engaging the tooth or pin c^{13}. When the loom is in operation, motion is transmitted continuously to the shaft c by means of the belt c^3 and pulley c', and this continuous motion is imparted to the spur-wheel c^6 by means of the pinion c^4. The toothed sector c^9, rotating with the spur-wheel c^6, engages with the pinion c^{10} once during every revolution of the spur-wheel c^6, and consequently imparts an intermittent motion to the shaft c^{11}. This shaft c^{11} is rotated while the sector c^9 is in engagement with the pinion c^{10}, and is permitted to remain at rest while the sector is out of engagement with said pinion c^{10}. The cam-wheel c^8, engaging the roller c^{19}, actuates an arm c^{18} and causes the jaw c^{20} to engage and firmly hold the pin c^{13} while the sector c^9 is out of engagement with the pinion c^{10}, and thus prevents the shaft c^{11} from being turned either accidentally or by the recoil of the moving parts. The intermittent rotary motion of the shaft c^{11} is imparted to the lay c^{17} by means of the links c^{15}, so that the lay c^{17} and reed d are driven forward and backward and are then permitted to remain at rest to afford the weaver an opportunity to shift the wefts according to the requirements of the pattern before the reed and lay are again driven forward.

e is a working-beam pivotally supported at the center by means of trunnions e', mounted upon the upper portion of the frame A. This beam e is connected with suitable mechanism (not shown) for oscillating it about the trunnions e'.

f', f^2, f^3, f^4, and f^5 represent the respective harness of the loom. The leaves or members of the harness f' and f^2 are attached to one extremity of the beam e by means of cords or in any other preferred manner, and the leaves or members of the harness f^3 and f^4 are attached to the other extremity of the beam, so that the leaves or members of the harness f' and f^2 are lifted when the beam e is turned, and the leaves or members of the harness f^3 and f^4 are lifted when the beam e is turned in the other direction, and the leaves or members of the harness f' and f^4 are lifted higher than the leaves or members of the harness f^2 and f^3, because they are located farther from the center of oscillation e'. The harness f^5 is a dead or stationary one, having the heddle-eyes thereof located about midway between the extreme upper and lower positions of the heddle-eyes of the harness f' and f^4.

Referring now to Fig. 3, g is a positively-driven picker-shaft provided with cams g' and collars g^2 and supported in suitable bearings attached to the frame A. g^3 are bell-crank levers pivotally attached to the frame A and having one arm thereof in engagement with the cams g', and the other g^5 attached to spring-actuated picker-sticks h by means of straps g^6. i and i' are superposed shuttle-boxes located at the respective extremities of the lay and slotted for the reception of the picker-sticks h. The upper extremities of the picker-sticks are slotted and are connected with the pickers h' and h^2. When the shaft g is revolved, the pickers h' and h^2 throw the two shuttles s and s' simultaneously across the lay, first in one direction and then in the other.

The entire warp is divided into three portions, hereinafter designated as the "ground warp," "binding warp," and "extra warp." The ground warp is preferably composed of jute and is wound on a beam b'. The binding warp is preferably composed of fine cotton yarn and is wound on a beam b^2, and the extra warp is composed of jute or other inexpensive material and is wound on a beam b^3. The ground warp appertains to the ground web of the fabric, and is divided into two portions, or "half-gangs," as they are sometimes called by weavers, designated, respectively, by the numerals 2 and 3. The binding warp appertains to the face and ground wefts and is divided into two portions or half-gangs, designated, respectively, by the numerals 1 and 4. The extra warp comprises stuffing warps or floats 5, but is not divided in half-gangs. The four divisions or half-gangs of the warp are led into the harness of the loom in the following order: divisions 2 and 3 of the ground warp through the leaves or members of the harness f^2 and f^3, respectively, and divisions 1 and 4 of the binding warp through the leaves or members of the harness f' and f^4, respectively. The extra warps 5 are led in through the stationary or dead harness f^5.

In order that the hereinbefore-described apparatus constituting my invention may be more fully understood, a brief description will now be given of the mode of producing thereby a woven fabric: First, the leaves or members of the harness f' and f^2 are lifted by the beam e, and the half-gangs or portions 1 and 4 and 2 and 3 of the warps form two sheds. The shed formed by the half-gangs 1 and 4 is located above or superposed upon the shed formed by the half-gangs 2 and 3, by reason of the harness f', appertaining to the half-gang 1, being lifted higher than the harness f^2, appertaining to the half-gang 2, as has been hereinabove explained. The extra warp 5, passing through the dead or fixed harness f^5, lies between and separates these two sheds and constitutes a "shuttle-race" for the upper shed. The two shuttles s and s', carrying the ground and face wefts, respectively, are driven through these sheds toward the right in the drawings, and at the same time by means of the pickers h' and h^2 and picker-sticks h, and thus a ground weft is in-

troduced into the lower shed and a face weft into the upper shed. It will be obvious that the two shuttles *s* and *s'* may be thrown successively; but excellent results have been attained in practice by throwing them simultaneously, and consequently preference is given to the latter method. The figure effect is not produced in my improved method of weaving by means of a Jacquard machine, but by the employment of figured chenille face wefts or printed yarn face wefts, and these face wefts are manipulated after each shot in order to produce the required figure effect by shifting them toward the right or left until they occupy the position required for the pattern. The required manipulation of the face-wefts may be readily accomplished during the interval of time which elapses while the lay c^{17} and reed *d* are at rest between each successive beat-up of the loom. In weaving plain cloth this manipulation of the face wefts is of course dispensed with, and, second, the leaves or members of the harness f^3 and f^4 are lifted by the beam *e*, and the half-gangs 3 and 4 form two superposed sheds. The shuttles *s* and *s'* are then thrown toward the left in the drawings in the manner above described, and the face and ground wefts are introduced into the two sheds, the former into the upper shed and the latter into the lower shed, thus completing one operation of the loom.

By repeating the above-described operations the process of weaving is made continuous.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a loom, of a lay and reed, a crank-shaft and link connected therewith for operating the lay, a spur-wheel keyed to said crank-shaft, a toothed sector engaging said spur-wheel, and means for rotating said sector, substantially as and for the purposes set forth.

2. The combination, in a loom, of a lay and reed, a crank-shaft provided with a pinion, a link connected with said lay and crank-shaft, a spur-wheel provided with a toothed sector meshing with said pinion, and means for rotating said spur-wheel and sector for imparting an intermittently-reciprocating motion to said lay and reed, substantially as and for the purposes set forth.

3. The combination, in a loom, of a lay and reed, a crank-shaft provided with a pinion, a link connected with said crank-shaft and lay, a pin attached to said pinion, a spur-wheel provided with a cam and with a toothed sector engaging with said pinion, a detent engaging with said cam and adapted to mesh with said pin, and means for rotating said spur-wheel, sector, and cam for imparting intermittently a reciprocating motion to said lay and reed and for checking the same, substantially as set forth.

4. The combination, in a loom, of a lay and reed, a crank-shaft provided with a pinion, a link connected with said crank-shaft and lay, a pin attached to said pinion, a spur-wheel provided with a cam and with a toothed sector engaging with said pinion, a detent loosely mounted on a counter-shaft and adapted to engage with said cam and mesh with said pin, a driver on said counter-shaft meshing with said spur-wheel, and means for rotating said counter-shaft, substantially as and for the purposes set forth.

5. The combination of a working-beam, a pair of harnesses attached to each of the arms of said beam, the members of each pair being attached at different points on the arm, means for oscillating said beam to lift one member of a pair of harnesses higher than the other member thereof, a lay, pickers, and picker-sticks, a picker-shaft, cams on said picker-shaft, bell-crank levers engaging said cams and connected with said picker-sticks, and means for rotating said picker-shaft, substantially as and for the purposes described.

6. The combination, with a loom provided with a lay having two superposed pickers, picker-sticks, and a picker-shaft adapted to simultaneously operate said sticks, of a working-beam provided with arms on opposite sides thereof, a pair of harnesses connected with each of the arms of said beam, the members of each pair being attached at different points on the arm, means, as described, adapted to actuate said beam to shift one harness of each pair higher than the other, and means, as described, to intermittently reciprocate said lay and to maintain said harnesses in open position after each beat-up of the loom, 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.