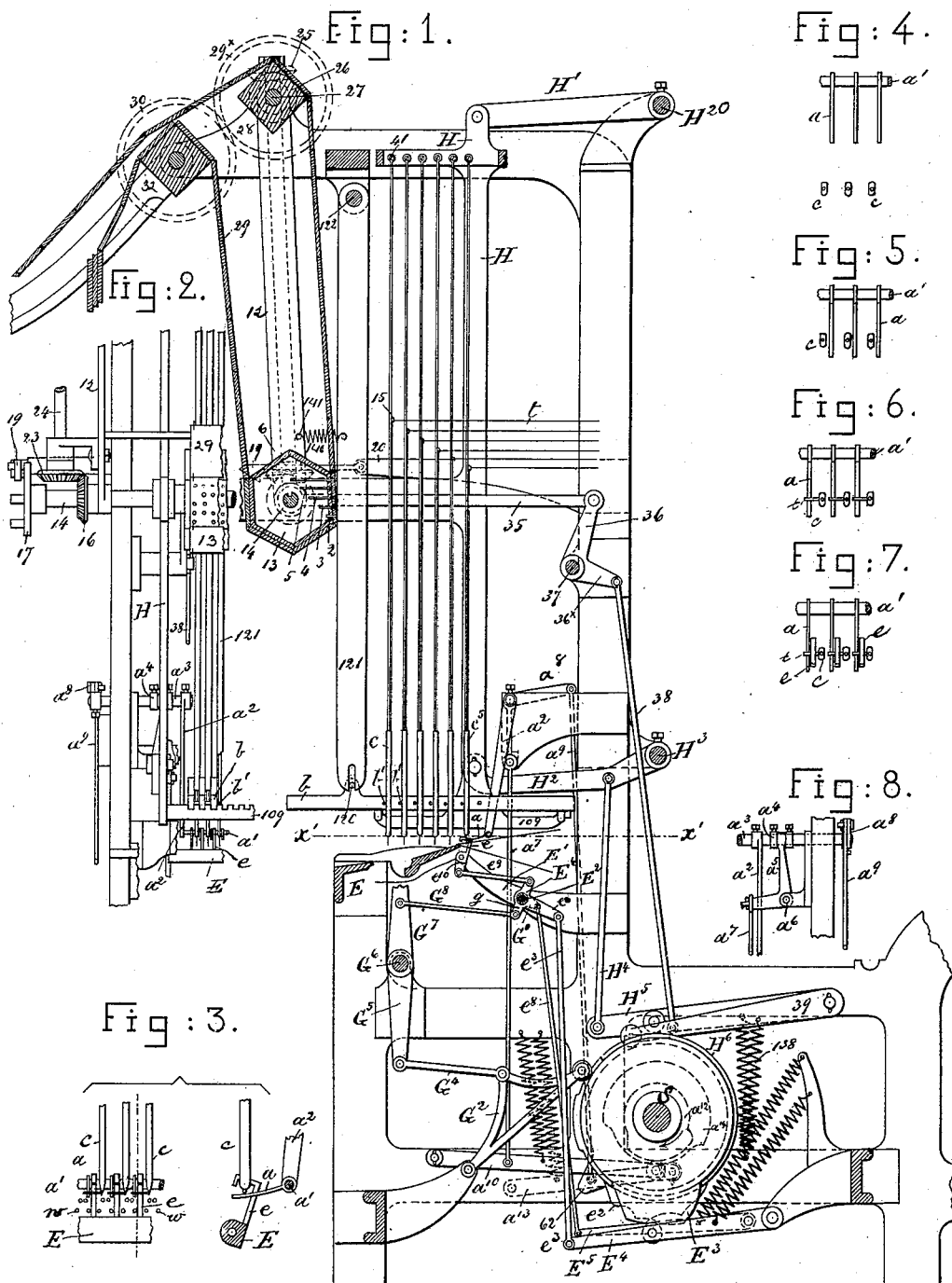


G. CROMPTON & H. WYMAN.
LOOM FOR WEAVING TUFTED FABRICS.

No. 343,113.

Patented June 1, 1886.



Witnesses.

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GEORGE CROMPTON AND HORACE WYMAN, OF WORCESTER, MASSACHUSETTS; SAID WYMAN ASSIGNOR TO SAID CROMPTON.

LOOM FOR WEAVING TUFTED FABRICS.

SPECIFICATION forming part of Letters Patent No. 343,113, dated June 1, 1886.

Application filed October 26, 1885. Serial No. 180,953. (No model.)

To all whom it may concern:

Be it known that we, GEORGE CROMPTON and HORACE WYMAN, of Worcester, county of Worcester, and State of Massachusetts, have
5 invented an Improvement in Looms for Weaving Tufted Fabrics, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention is an improvement upon that class of loom represented in our applications, Serial No. 136,604, filed July 2, 1884, and Serial No. 142,487, filed September 8, 1884, wherein are shown carriages containing movable yarn
15 carriers or needles, and in application Serial No. 179,213, filed October 7, 1885, wherein the carriages have a series of passages or holes, one back of the other, for the reception of the tuft yarns.

20 In this our present invention we have provided means whereby the tuft-yarns extending below the carriages are carried aside or moved laterally with relation to the warp-threads, so that the tuft-yarns are laid across the spaces
25 between adjacent warp-threads, and in such condition the tuft-yarns are caught by hooks which rise between the warp-threads, and in descending below the latter the hooks draw down with them the said tuft-yarns, and there-
30 after the lower ends of the tuft-yarns drawn down by the hooks are upturned to the upper side of and about the warp-threads next to them, in which condition the tuft-yarns will be cut off, leaving tufts.

35 Our present invention consists, essentially, in the combination of a series of carriages located side by side near the warp-threads, and provided each with a series of tuft-yarn carriers, guides, or needles arranged therein one
40 behind the other, and means to move the said carriages for different distances in the direction of the length of the warp-threads, with means, substantially as described, to effect the movement of the ends of the tuft-yarns across
45 the spaces between the warp-threads, hooks to engage the said tuft-yarns near their ends, and means to operate the same to draw them below the warp-threads preparatory to being again turned up above the warp-threads and
50 to being cut off to leave loops of yarn to constitute tufts.

Our invention also consists in a series of carriages arranged side by side across the loom-frame substantially parallel to the warp-threads, a series of tuft-yarn carriers, guides, 55 or needles arranged therein one behind the other, and a series of carriage-actuating levers provided with projections combined with a pattern cylinder or surface to act upon the said projections and move the said levers and
60 carriages different distances according to the indications of the said pattern-surface.

Figure 1 is a vertical section of a sufficient portion of a loom for weaving tufted fabrics to enable our invention to be understood, the 65 section being in the line xx , Fig. 9; Fig. 2, a partial front elevation of a part of the left hand end of the loom; Fig. 3, details showing parts of the hook-bar, its hooks, some of the tuft-yarn carriers, and the fingers for trailing
70 the tuft-yarns across the spaces between the warp-threads shown by dots. Figs. 4 to 7, inclusive, represent the fingers and their actuating-bar and the tuft-yarn carriers in the different positions occupied by them in the formation of the fabric. Fig. 8 is a detail showing the devices for moving longitudinally the bar having the fingers attached to it. Fig. 9
75 is a section below the line $x'x'$, Fig. 1, chiefly to show the hook-carrying bar, and the means to move it longitudinally to cause the hooks to act as the tuft-returning devices. Fig. 10 is an enlarged detail of devices for moving the hook-bar longitudinally; Fig. 11, a detail of the oscillating hub, and Fig. 12 a detail of the 85 rock-shaft hub.

Referring to the drawings, the frame-work, the shaft S , the hooks c , secured to the hook-bar E , carried by the arms E' , secured to the rock-shaft E^2 , the connected arm e^1 , link e^2 , 90 lever E^4 , and cam E^3 to move the said lever and thus give to the hooks their ascending and descending movement, the rod e^9 connected to the arm e^{10} of the hook-bar, the lever E^5 , the link e^8 , its connected lever E^6 , cam e^7 , secured to shaft S and moving the said lever, thereby
95 imparting to the hooks c their tipping or rocking movement, and the oscillating hub G' , (see Figs. 9, 10, and 11,) provided with a wedge-formed projection, g' , and arm g , and
100 placed loosely upon the rock-shaft E^2 , the link G^8 , connected with the arm g and with the

arm G^7 of the rock-shaft G^6 , and the arm G^5 , link G^4 , lever G^2 , cam G , the rock-shaft hub G^9 , (see Figs. 9, 10, and 12,) having the wedge or incline g^2 to co-operate with the cam-hub G^9 , and the spring G^{10} , to keep the cam-hub G^9 and rock-shaft hub G^9 together, thus effecting the lateral movement of the hooks e in the loom, are all as in United States Patent No. 270,495, dated January 9, 1883, the said devices being operated as and for the purposes described in said patent. We have provided our improved loom with the following additional devices:

In the loom described in United States Patent No. 270,495, referred to, the end of the tuft-yarns are trailed across the warp-threads by moving the spool-frame laterally; but herein the ends of the tuft-yarns are made to trail across the warp-threads by means of fingers a on a rod, a' , secured to arms a^2 , attached to a slide-rod, a^3 , provided with a grooved hub, a^4 , (see Fig. 8,) engaged by the forked end of an elbow-lever, a^5 , pivoted at a^6 , the said elbow-lever being joined by link a^7 with a lever, a^{10} , acted upon by a cam, a^{12} , fast on shaft S , the said cam and elbow-lever and its connections referred to compelling the fingers a to be moved laterally under the carriages b , and causing the tuft-yarns between the said carriages and the warp-thread w to be trailed across the warp-threads preparatory to the hooks e rising between and above the warp-threads to engage the tuft-yarns, as in Fig. 3, the said hooks e , the same as those described in United States Patent No. 270,495, being operated as and manipulating the tuft-yarns to form loops, all as fully described in the said patent, and, being well understood, need not be herein more specifically described. The slide-rod a^3 has also a rocking movement imparted to it, so as to cause the fingers to be pushed forward between the needles or guides of the carriages, to be described, as from the position Fig. 4 to that shown in Fig. 5, preparatory to moving the fingers laterally, as described, and then returning the said fingers. This rocking movement is effected through the arm a^8 , link a^9 , lever a^{13} , and cam a^{14} on the shaft S .

Each of the series of carriages b , as herein shown, has at one side a series of pins, b' , which abut against the side of the adjacent carriage.

In the spaces formed by inserting the pins in the carriages are placed the lower ends of the tuft-yarn carriers or needles c to c^5 , the shanks of which are pivoted at 41 on the frame H , connected at its upper end, (see Fig. 1,) to the arm H' of the rock-shaft H^{20} . At its lower end the frame H has pivoted to it the lever H^2 , secured to the rock-shaft H^3 , the said lever having pivoted to it the rod H^4 , attached to the lever H^5 , acted upon by the cam H^6 . The upward movement of the lever H^2 causes the frame H to be lifted, and with it the rest-bars 6; 109, in grooves of which the said carriages slide.

Each carriage b has an ear provided with a pin, 120, which enters a slot in the lower end of a lever, 121, pivoted at 122, there being one lever for each carriage. Each lever 121 has a series of projections, 2 3 4 5 6, of different lengths, such as are applied to the carriages shown in our application, Serial No. 179,213, the said projections being arranged on the levers 121 opposite the cylinder 13, the said cylinder having arranged about it, as herein shown, a chain of pattern-cards, 29, having holes and spaces in accordance with the pattern. The pattern-surface thus constituted and its attached and actuating parts are substantially as in our application Serial No. 179,213, the said pattern-surface acting against the ends of the projections of the levers 121 to place the said levers and the carriage connected therewith in the position required.

The levers 121, one for each carriage, are normally held toward the pattern-surface by springs 140, attached to a rod, 141, secured to the frame 12, carrying the pattern-surface.

Herein the tuft-yarn carriers or needles have eyes 15 to serve as guides for the tuft-yarns t .

The shaft 14 of the pattern-surface has a pin-wheel, 17, which is engaged by a pawl, 19, attached to a bracket, 20, secured to the frame-work.

The shaft 14 of the pattern-surface has attached to it a link, 35, jointed to an arm, 36, of a rock-shaft, 37, it having a second arm, 36 \times , connected to a link, 38, joined to the lever 39, operated in one direction by a cam, 62, and in the other by a spring, 138. The shaft 14 outside the frame has a bevel-gear, 16, engaged by a bevel-gear, 23, on an upright shaft, 24, having at its upper end, (see dotted lines,) a bevel-gear, 25, which engages a bevel-gear, 26, on the shaft 27, these parts and the gears 29 \times and 30 and the barrel 28 and 32, over which is passed and by which is moved the chain of cards 29, being substantially as shown in our pending application, Serial No. 179,213, such parts not being herein claimed.

In operation the frame H , the rest 109, and carriages are raised and lowered at the proper times to raise and lower the tuft-yarn carriers or needles, raising them to permit the operation of any usual cutting mechanism to cut off the tuft-yarns, and to place the ends of the needles close to the warps.

The cutting mechanism may be substantially as in United States Patent No. 233,290, one member of the cutter being attached to the upper end of the arm G^7 , common to said patent, but therein marked G^2 . (See Fig. 1.) Herein the upper end of the cutter-carrying arm G^7 is shown as broken off, to avoid confusion of the drawings.

In another application, Serial No. 142,487, filed September 8, 1884, we have shown and claimed rests and carriages thereon, combined with tuft-yarn carriers or needles pivoted above and extended down through the said carriages; and so, also, in another application,

Serial No. 179,213, filed October 7, 1885, we have shown and claimed a series of tuft-yarn carriages provided with passages for the reception of several tuft-yarns, the said carriages
5 having projections of different lengths, combined with a pattern card or surface and means to move it, and so also in the application last mentioned we have claimed in combination with the foregoing means for restoring the car-
10 riages to their normal position preparatory to moving them for the selection of each effective row of tufts.

We claim—

1. A series of carriages located side by side
15 near the warp-threads, and provided each with a series of tuft-yarn carriers, guides, or needles arranged therein, one behind the other, and means to move the said carriages for different distances in the direction of the length
20 of the warp-threads, combined with means, substantially as described, to effect the movement of the ends of the tuft-yarns across the spaces between the warp-threads, and with hooks to engage the said tuft-yarns near their

ends, and means to operate the same to draw 25 them below the warp-threads preparatory to being again turned up above the warp-threads and to being cut off to leave loops of yarn to constitute tufts, substantially as described.

2. A series of carriages arranged side by 30 side across the loom-frame substantially parallel to the warp-threads, a series of tuft-yarn carriers or needles arranged therein, one behind the other, and a series of carriage-actuating levers provided with projections, com- 35 bined with a pattern cylinder or surface to act upon the said projections and move the said levers and carriages different distances, according to the indications of the said pat- 40 tern-surface, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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HORACE WYMAN.

Witnesses:

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G. W. GREGORY.