

(No Model.)

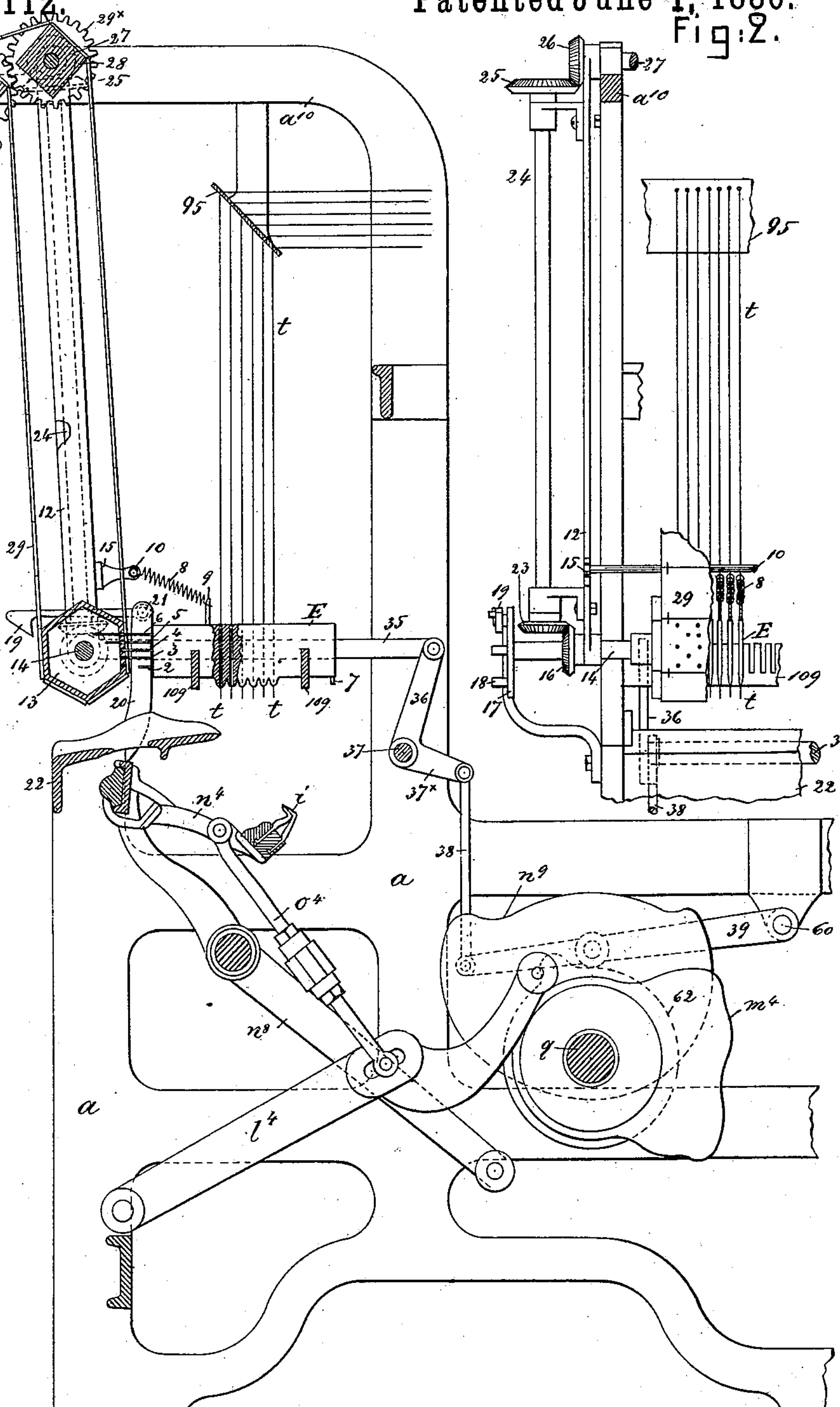
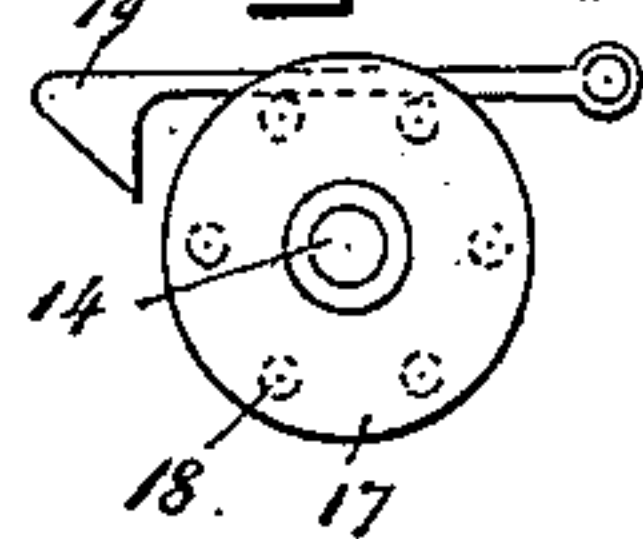
2 Sheets—Sheet 1.

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

No. 343,112  
Fig:1.

Patented June 1, 1886.  
Fig:2.

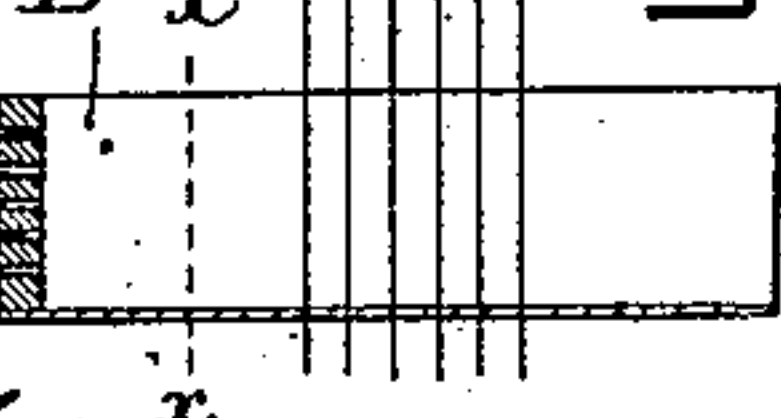
Fig:3.



Witnesses.

John A. Rennie  
Fred L. Emery

Fig:4.



Inventors.

George Crompton  
Horace Wyman  
Per: Crosby & Gregory  
their attys.

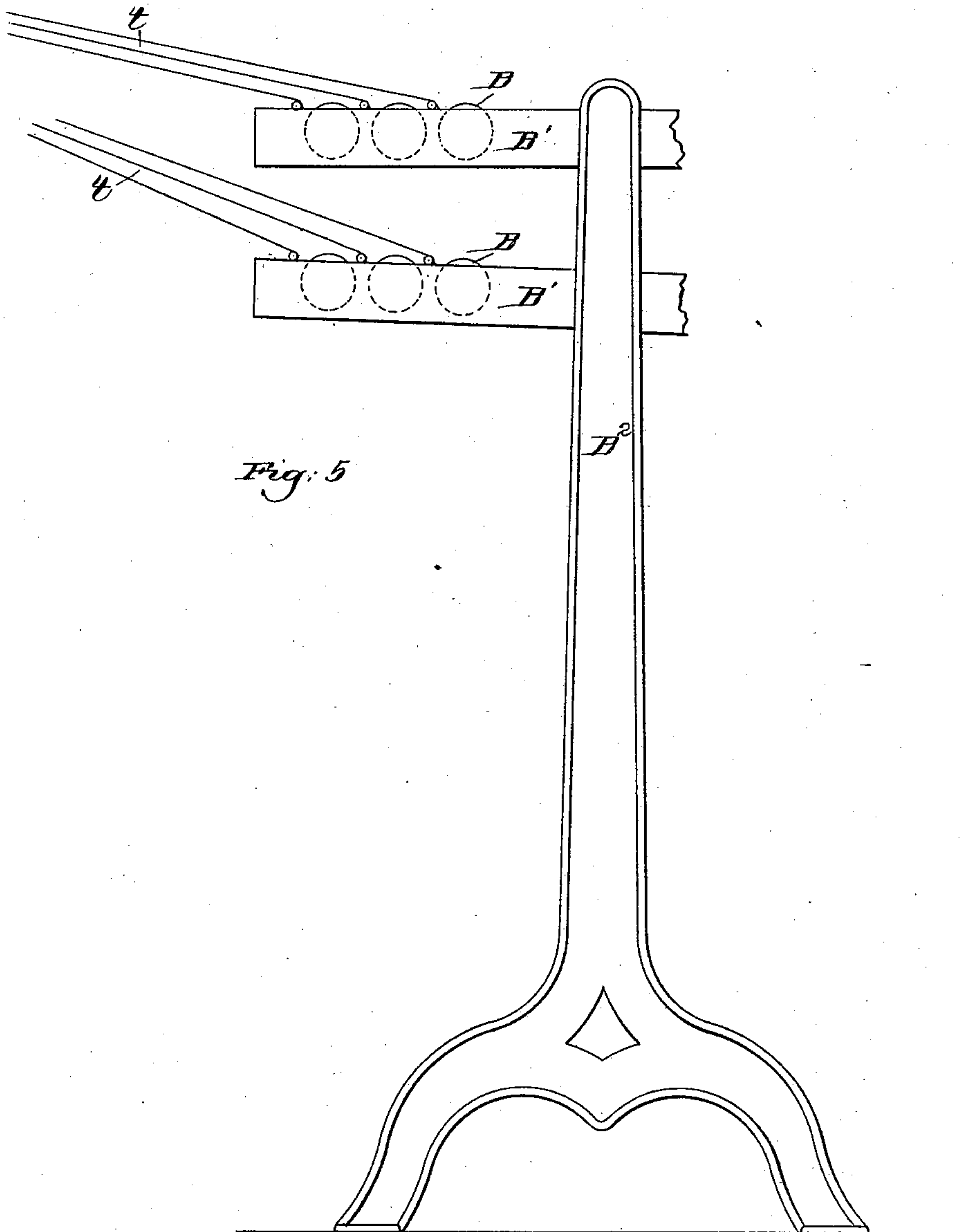
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*Frederic L. Emery*  
*John A. Renne*

Inventors.

*George Crompton*  
*Horace Wyman*  
Per: *Crosby & Gregory*  
their Attys.



# UNITED STATES PATENT OFFICE.

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. 343,112, dated June 1, 1886.

Application filed October 7, 1885. Serial No. 179,213. (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 relates to looms of that class adapted for the production of tufted fabrics—such, for instance, as moquette carpets—the object of the invention being to improve and simplify the means for controlling the tuft-yarns,  
15 in order that the same may be taken directly from independent spools or bobbins, one for each tuft-yarn, thus obviating the beaming of yarns of different colors on separate warp-beams, one for each transverse row of tufts,  
20 and also to dispense with the chains and moving devices therefor, as heretofore usually employed.

The invention herein contained consists, essentially, in a series of horizontally-sliding  
25 tuft-yarn presenting carriages arranged side by side, and means to move the said carriages varying distances in the direction of the length of the warp-threads, the said carriages having a series of openings or eyes arranged there-  
30 in, one behind the other, in the direction of the length of the warp, combined with tuft-yarn-seizing devices to pass up between the warp-threads and seize the ends of those tuft-yarns depending from the lower sides of the  
35 said carriages, which, by the movement of the carriages, are left in operative position immediately above the said tuft-yarn-seizing devices, the latter acting to seize and draw the said tuft-yarns directly between the warp-  
40 threads, as will be described.

In another application, No. 136,604, filed by us July 2, 1884, we have shown a series of carriages adapted to be moved in the direction of the length of the warp-threads, each carriage having a series of independent movable  
45 tuft-yarn carriers or needles, each supplied with yarn from a separate spool or bobbin, each tuft-yarn carrier or needle being under control of a pattern-surface.

50 United States Patent No. 39,759, dated Sep-

tember 1, 1863, shows and describes a loom containing pinchers to take tuft-yarns from spools carried by chains, each spool having the yarns wound thereon in the order of the colors of some one transverse row of tufts to  
55 be made, there being one such spool for each different row of tufts to be produced.

The loom herein to be described contains parts of each of the looms referred to, and in combining them operatively we have consid-  
60 ered it unnecessary to show but few of the parts of each of the said looms, the parts which are not shown being common to the looms referred to.

Figure 1 is a partial section of a loom em-  
65 bodying our invention, the carriage shown being partially broken out to show the tuft-yarn grooves or passages therein, the creel-frame holding the tuft-yarn spools being omitted. Fig. 2 is a broken partial front eleva-  
70 tion thereof, part of the cards of the pattern chain or surface of the Jacquard apparatus and the upper barrels being omitted, as well as the parts below the breast-beam. Fig. 3 is a detail to be referred to. Fig. 4 shows a  
75 modified form of carriage; and Fig. 5, a separate view of part of the creel and a number of tuft-yarn spools, there being a spool for each tuft-yarn used.

The loom-frame *d*, the pinchers or nippers  
80 *i*, arm *n*<sup>4</sup>, arm *n*<sup>8</sup>, lever *l*<sup>4</sup>, adjustable rod *o*<sup>4</sup>, shaft *q*, and cams *m*<sup>4</sup> and *n*<sup>9</sup> are substantially the same in construction and operation as the parts marked by like letters in the United States Patent No. 39,759, dated September 1,  
85 1863, and in practice the said nippers *i* will be opened and closed and operated in substantially the manner described in said patent, to engage the tuft-yarns *t* and pull them into the shed of the warp-threads to form tufts.  
90

The loom herein described may have shed-forming mechanism substantially the same as in the said patent; but we have herein considered it unnecessary to show the shed-forming mechanism; nor have we considered it  
95 necessary to show all the parts which actuate the nippers *i*, nor all the parts which co-operate with the said nippers when taking the tuft-yarns and making them into tuft-loops, for all the said parts for manipulating the  
100



tuft-yarns may be found fully described in the said patented loom.

Desiring to dispense with the long chains and series of spools having the tuft-yarns wound thereon in the order of colors appearing in each transverse row of tufts, we have in their place arranged side by side a series of tuft-yarn-presenting carriages, E, and have placed the said carriages in grooves of rests or bars 109, extended from side to side of the loom, the said carriages being free to be slid or moved horizontally backward away from the breast-beam and in the direction of the length of the warp by the action of a pattern-surface, to be described, it, as herein shown, acting upon one or the other of a series of projections, 2 3 4 5 6, extended horizontally from the end of each carriage, as shown best in Figs. 1 and 4. Each carriage has a stop, 7, which is normally kept pressed against one of the bars or rests 109 by a spring, 8, connected at one end with a pin, 9, attached to the carriage E, and at its other end with a rod, 10, held at each end by a bracket, as at 15, secured to the frame 12, which supports the shaft 14 of the hollow hexagonal barrel 13, preferably composed of metal plates joined to head-pieces. Each of the plates composing the barrel 13 is provided, as herein shown, with five rows of holes (see Figs. 1 and 2) to correspond with the five projections 2 to 6, inclusive, of each carriage, there being as many holes in each longitudinal row of holes as there are carriages E in the series from side to side of the loom, there being as many carriages as there are tufts in each transverse row of tufts. But one end of the shaft 14 is shown in the drawings, as the other is like it.

The shaft 14 shown in the drawings is provided with a bevel-gear, 16, and with a wheel, 17, having pins 18, which are engaged by a pawl, 19, pivoted at 21 on a standard, 20, attached to the loom-frame near the breast-beam 22. The bevel-gear 16 engages a bevel-gear, 23, on the upright shaft 24, held in bearings attached to the frame 12. The upper end of the shaft 24 has a bevel-gear, 25, which engages a bevel-gear, 26, on a shaft, 27, having upon it a barrel, 28. The shaft 27 has a toothed wheel, 29<sup>x</sup>, which engages a toothed wheel, 30, on a shaft, 31, provided with a third barrel, 32, and below this barrel is a suitable cradle, 33, to support in usual manner the chain of pattern-cards 29, of usual construction, the said barrels being operated to move the said chain of pattern-cards intermittingly. The gears 29<sup>x</sup> and 30 are attached to the shafts 27 and 31 just inside of the rigid overhanging part *a*<sup>10</sup> of the loom-frame, and are omitted in Fig. 2. The pattern-cards 29, connected in the proper order, and, together with the barrel 13, constituting the pattern-surface, are each provided with holes, some of which coincide with those of the said barrel; but each pattern-card serves to close one or more of the holes of each vertical row of holes in the barrel, the particular hole

which is so closed depending upon the exigencies of the pattern in the fabric being woven.

Fig. 2 shows a part of but one of the cards perforated for use in usual manner. The frame 12 is vibrated or swung backward and forward at regular intervals by links 35, attached in practice to the journals of the shaft 14 at each end of the barrel 13, and to the levers 36 on a shaft, 37, one of said levers having an arm, 37<sup>x</sup>, connected by a link, 38, with a lever, 39, pivoted at 60, and acted upon by a cam, 62. (Shown in dotted lines, Fig. 1, on the shaft *q*.) As the barrel is swung outward by the devices described, the hooked pawl 19 in engagement with a pin, 18, of the disk 17, attached thereto effects the partial rotation of the said barrel, bringing a new card, properly perforated, according to the pattern, in position with relation to the projections 2 3 4 5 6.

The horizontally-movable carriages E are provided with openings or passages for the reception of the tuft-yarns *t*, which latter are drawn through the said passages, one behind the other, in the direction of the length of the carriages, leaving the free ends of the tuft-yarns *t* depending singly side by side, but not touching each other, from the lower under side of the carriages, in which condition the tuft-yarns *t* are retained frictionally, to be caught by the nippers *i* or other usual equivalent device employed to grasp the tuft-yarns *t* and pull them from the recesses or openings in the carriages to form from them the tufts to appear in the fabric. Preferably the carriages will have small nipples or projections at their under sides, as in Fig. 1; but, if desired, the carriages may be made from sheet metal bent into V shape and perforated, as in Fig. 4, which shows a longitudinal and a cross section of a modified form of carriage with tuft-yarns therein, the upper part or edge of the carriage being pinched together to produce sufficient friction on the tuft-yarns to keep them from slipping back in the carriages.

The passages for the tuft-yarns made in the carriages (shown in Fig. 1) will in practice be of such diameter as to receive the yarns sufficiently snug to produce the required tension and prevent the yarns from slipping back.

The tuft-yarns *t*, taken from spools B on a creel or frame, B' B<sup>2</sup>, substantially as shown in Fig. 5, and also in our application hereinbefore referred to, are led through guides in a guide-board, 95, supported from the frame *a*<sup>10</sup>, the said guide-board and guides enabling the tuft-yarns to be directed from a horizontal into a vertical plane, the guide-holes being so located and the board so placed that the tuft-yarns are led into the passages of the carriages one behind the other, the guide-board preventing the interference of the separate yarns going not only to each carriage, but to all the carriages. After the formation of each row of tufts the barrel 13 and pattern-cards are moved to the left, viewing Fig. 1, by the cam 62 and parts actuated thereby, as before described, and the barrel is turned one step,



bringing a new card in working position. While a new card is being brought into working position, the springs 8 act to draw all the carriages toward the breast-beam with the stops 7 against the rest 109, and thereafter the pattern-card is moved to act against the projections of the carriages, moving them different distances, according to which projection 2 to 6 is struck by the card, and the carriages having been distributed by the pattern-surface the pinchers or nippers *i* are raised between the warp-threads and opened or made to engage the tuft-yarns, as provided for in United States Patent No. 39,759, hereinbefore referred to, the pinchers *i* herein shown being the same as contained therein, and designated by like term and letter.

We do not intend or desire to limit our invention to the exact construction of pinchers shown, as we may employ other well-known forms of pinchers, which rise from below the warp to seize the tuft-yarns and form loops.

The projections 2 to 6 are of different lengths, their difference being substantially equal to the distance from center to center of the different tuft-yarn carriers. When the projection 2 is struck by the face of a card moved against it by the barrel as the latter is moved backward from the breast-beam, and the projections 3 to 6, inclusive, enter holes made in the card, and thence pass into the hollow barrel 13, the carriage will be moved for only such distance as to place the tuft-yarn *t* second from the right in Fig. 1 in position to be seized or taken by the nippers *i*.

In Fig. 1 the card is shown as having struck the projection 3, which is of a length to insure the placing of the third tuft-yarn *t* from the right of Fig. 1 in position to be taken by the nippers.

If the hole in the barrel 13 opposite the longest projection, 6, is covered by a part of the card, and the latter is thus made to strike the projection 6, the carriage E will receive its greatest movement, and will be placed in such position with relation to the nippers *i* as to place the tuft-yarn *t* at the left-hand end of the carriage in position to be taken by the nippers.

The positions of the holes of each row of vertical holes in the pattern card vary according to the particular color of the tuft which it is desired that each carriage of the series of carriages shall contribute to the next transverse row of tufts to be made, and consequently the carriages will be moved over different distances at each movement of the pattern-surface toward them, the distance depending upon which of the tuft-yarns of each carriage is to be left in operative position to have its yarn caught by the nippers *i*.

We denominate as the row of effective tuft-yarns those which are left in a transverse row, ready to be taken by the nippers or pinchers and be drawn between the usual warp-yarns to produce a transverse row of tufts. After the completion of each row of tufts the car-

riages are all moved to their full extent toward the breast-beam, ready to be again moved varying distances for the next row of tufts, and so on according to the particular colored yarn that each of the carriages is next to contribute to the effective row of tuft-yarns. The ends of the tuft-yarns, having been drawn down between the warp-threads, are then turned up above the warps, as in the Patent No. 39,759, and the tuft-yarns will then be cut off at the proper distance above the closed shed to form tufts of the proper length.

We have not considered it necessary to show the tuft-cutting mechanism, as it may be of usual construction—such, for instance, as in United States Patent No. 233,290.

The cam *m*<sup>4</sup> strikes the roller at the end of the lever *i*<sup>4</sup>.

We do not desire to limit our invention to the exact form of pattern-surface to automatically move the carriages horizontally over varying distances preparatory to forming each row of tufts in the fabric being woven, and instead of the pattern-cards shown we may employ any other well-known equivalent pattern-surface.

We do not herein claim a series of carriages containing tuft-yarn carriers or needles which are moved independently in the carriages, for such devices are shown and claimed in our application Serial No. 136,604; nor do we herein claim a series of carriages each having a series of tuft-yarn carriers or needles which are acted upon and moved by the said carriages, as such devices form the subject-matter of another application made by us, Serial No. 142,487, filed September 8, 1884.

In Fig. 5 we have shown by itself the upright B<sup>2</sup>, and the projecting arms B', constituting a creel for the reception of the spools B B, one for each tuft-yarn *t* used, the said tuft-yarns being carried from the said spools through holes in the guide-plate 95, and thence to the carriages, the free ends of the said yarns depending from the said carriages.

We claim—

1. A series of horizontally sliding or moving carriages arranged side by side, and provided with passages arranged one behind the other in the direction of the length of the warp for the reception of the tuft-yarns, whereby the latter depend vertically from the lower side of the said carriages, and means, substantially as described, to move the said carriages for varying distances in the direction of the length of the warp-threads, combined with pinchers or nippers, substantially as described, to seize the ends of the tuft-yarns left depending from the carriages when left in operative position above them, and with means to operate the said pinchers or nippers, substantially as described.

2. A series of sliding carriages arranged across the loom side by side slightly above the level of the breast-beam, and provided, each carriage, with a series of passages for the reception, one behind the other, of a series of



tuft-yarns, and means, substantially as described, to automatically move the said carriages over varying distances to place the desired tuft-yarn of each carriage in what is to be the effective row of tuft-yarns, combined with guides to receive and direct the said tuft-yarns to the passages of the carriages, substantially as described.

3. A series of tuft-yarn carriages provided with passages for the reception of several tuft-yarns, one behind the other, in the direction of the length of the warps, and having projections of different lengths, combined with a pattern card or surface and means to move it, to operate substantially as described.

4. The series of tuft-yarn carriages provided with a series of passages for the tuft-yarns, and having projections at or near the ends of the carriages, combined with rests for the carriages, a pattern-surface to automatically move the said carriages over varying distances, and means, substantially as described, to restore the car-

riages to their normal positions preparatory to moving them for the selection of each effective row of tufts, substantially as described.

5. A series of carriages arranged side by side across the loom, and provided each with a series of tuft-yarn passages, one behind the other, and a creel and spools to hold each but one of the tuft-yarns led to the said carriages, and a series of guides for the tuft-yarns between the spools and carriages, combined with means, substantially as described, to automatically operate the tuft-yarn carriages for different distances, according to which particular tuft-yarn of each carriage is next to be employed in the next row of tufts.

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

GEORGE CROMPTON.  
HORACE WYMAN.

Witnesses:

J. A. WARE,  
G. W. GREGORY.