

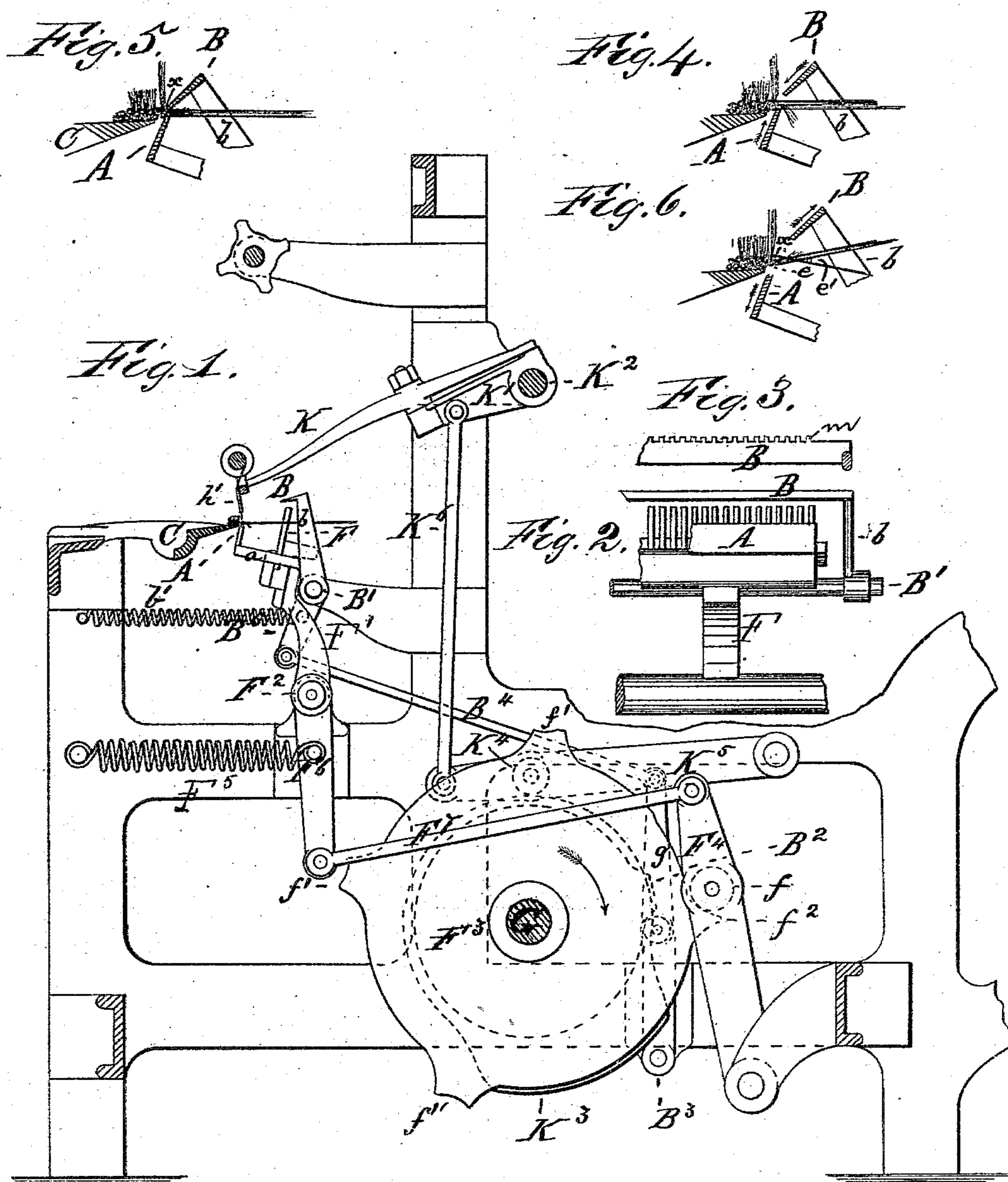
(No Model.)

C. E. SKINNER.

LOOM FOR WEAVING TUFTED FABRICS.

No. 288,267.

Patented Nov. 13, 1883.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## LOOM FOR WEAVING TUFTED FABRICS.

SPECIFICATION forming part of Letters Patent No. 288,267, dated November 13, 1883.

Application filed December 20, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES EDWARD SKINNER, of Yonkers, in the county of Westchester and State of New York, have made an invention of certain new and useful Improvements in Looms for Weaving Tufted Fabrics; and I do hereby declare that the following, in connection with the accompanying drawings, is a full, clear, and exact description and specification of the same.

This invention has reference to looms for weaving Moquette carpets and similar fabrics, in the weaving of which rows of tufts of colored yarns are inserted in and secured to the body of the fabric; and the object of the invention is to enable the ends of the rows of tufting material inserted from one side of the position of the warp-threads in the loom to be turned toward the side from which they have been inserted, so that both ends of the tufting material may be at the same side of the fabric.

The invention consists of certain combinations of mechanical devices, which are recited in the claims at the close of this specification. In order that these combinations may be fully understood, I have represented in the accompanying drawings and will proceed to describe certain parts of a loom embodying the invention in the best form at present known to me.

Figure 1 represents a longitudinal section of parts of the loom. Figs. 2, 3, 4, 5, and 6 represent detached portions of the loom, these figures being drawn upon a larger scale than Fig. 1.

As the invention has reference to particular portions of the loom, the other parts thereof may be constructed substantially as described and represented in the Letters Patent of the United States No. 186,374, with such variations only as may be necessary by reason of the present invention, as hereinafter set forth.

The warp and the weft threads or filling of the fabric may be held and operated substantially as they are in other Moquette-carpet looms.

The tufting material is by preference applied to a series of spools, which are carried by means of chains or other mechanism, and are

presented in succession to the devices by which they are brought to and removed from the vicinity of the fabrics for the purpose of having the tufts placed therein. Each spool is fitted in a spool frame or carriage, which is provided with a row of tubes, or of needles,  $h$ , to hold the ends of the tufting material, and the frame should also be provided with a spring-brake to prevent the turning of the spool, except when the tufting material is pulled off it by the operation of the mechanism. In order that the spool-frame may be moved toward and from the place in the loom at which the tufting is to be applied to the warp-threads, the loom is preferably provided with a pair of movable arms,  $K$ , (one at each side of the loom,) which are connected with a rock-shaft,  $K^2$ , which is caused to rock, so as to move the ends of the movable arms toward and from the position of the warp in the loom. The movable arms  $K$  are preferably provided with clutches to grasp the ends of the spool-frames, and the said arms are preferably connected by pivots with the rock-shaft arms  $K'$ , (one for each movable arm,) so that the first may be moved laterally in opposite directions to grasp and release each spool-frame in succession. The said movable arms are caused to move toward and from the position of the fabric by means of a cam,  $K^3$ , operating upon said arms through the intervention of a friction-wheel,  $K^4$ , cam-lever  $K^5$ , rod  $K^6$ , rock-shaft arm  $K'$ , and the rock-shaft  $K^2$ , and the lateral movements of the movable arms to enable them to grasp and release the spool-frames may be effected by the same means as is described for that purpose in Patent No. 233,290.

In order that the present invention may be embodied in the loom, it is provided with two bending-bars, which are caused to operate in opposite directions at the proper times upon the fabric being woven, so as to bend it sufficiently to cause the ends of the tufting material that have been inserted (by means of tubes or their equivalents) between the warp-threads from one side of the warp in the loom to bend backward toward that side, so that they may subsequently be made to stand erect at the face side of the fabric. In the example represented

in the drawings, one, A, of these bending-bars is arranged to operate beneath the position of the warp-threads, and the other bending-bar, B, is arranged to operate above that position. Each bar extends across the loom, so as to operate upon the width of fabric being woven therein. The lower bending-bar, A, is in this instance connected with the lay F of the loom by connections *a*, (one at each end of the bending-bar,) so that motion is imparted to said lower bending-bar, through the intervention of the lay, by means of the lay-cam F<sup>3</sup>, which is connected with and is caused to revolve by the cam-shaft G of the loom, and which operates upon the lay through the intervention of the friction-wheel *f*, the lever F<sup>4</sup>, the rod F<sup>5</sup>, the rock-shaft arm F<sup>6</sup>, the lay rock-shaft F<sup>2</sup>, and the arms F<sup>7</sup> of the lay. The backward movement of the lay is insured by a spring, F<sup>8</sup>, which operates antagonistically to the lay-cam F<sup>3</sup>. The upper edge of this lower bending-bar, A, is grooved longitudinally, as shown in Fig. 6, so that it may fit against and engage with one of the filling-threads *e* of the fabric, and the cam F<sup>3</sup> is constructed with a depression, *g*, in that portion of its rim which succeeds the projection *f*<sup>2</sup>, by which the lay is operated for beating up the shoot of binding filling-thread which secures the row of tufts in the fabric. This depression is of such depth that it permits the lower bending-bar to be moved backward in the loom, (by the action of the spring F<sup>8</sup>,) and at the same time to be raised, by reason of its vibration on the lay rock-shaft F<sup>2</sup>, until said lower bending-bar is pressed upward beneath the shoot of filling *e* which is introduced into the warp last preceding the shoot of binding-filling. The upper bending-bar, B, is connected by arms *b* with a rock-shaft, B<sup>1</sup>, which is rocked at proper times by means of a cam, B<sup>2</sup>, secured to the cam-shaft G, the transmission of motion being effected by the lever B<sup>3</sup> and its friction-wheel, the rod B<sup>4</sup>, and the arm B<sup>5</sup>, secured to the bending-bar rock-shaft B<sup>1</sup>. The backward movement of the upper bending-bar is effected by a spring, *b*<sup>1</sup>, which operates antagonistically to the cam B<sup>2</sup>. This upper bending-bar is so adjusted in the loom that whenever it is depressed by the operation of its cam B<sup>2</sup> its edge strikes the last shoot of binding-filling *x* which has been introduced, and bends the fabric over the front edge of the lower bending-bar, A. In order that the upper bending-bar, B, may press with its full force against the said shoot of binding-filling, the edge of the bar is by preference notched, as shown at Fig. 3, so that teeth *m*, Fig. 3, are formed, which enter between the warp-threads and act directly upon the shoot of binding-filling.

The loom to which the bending-bars are represented as applied in the drawings is one in which three shoots of coarse filling are inserted in the fabric for each row of tufting material which is inserted therein, and is secured by a shoot of binding-filling; hence the lay-cam F is provided with three projec-

tions, *f*<sup>1</sup> *f*<sup>2</sup> *f*<sup>3</sup>, for operating the lay for the coarse filling, and with one projection, *f*<sup>2</sup>, for operating the lay for the fine or binding filling; and the cam B<sup>2</sup>, for the upper bending-bar, B, is fitted to operate that bar once for every fourth shoot of filling. The parts of the loom may of course be varied to adapt it to weaving with a different order of filling; but when coarse filling is employed, I prefer to construct the projections *f*<sup>1</sup> *f*<sup>2</sup> *f*<sup>3</sup> of the lay-cam, which operate the lay for coarse filling, double pointed, as shown in the drawings, so as to produce a double beat of the lay upon each shoot of such filling.

The mode in which the devices above described operate is as follows: The last shoot of coarse filling *e* which precedes the insertion of the tufting-yarns having been inserted in the warp, and having been beaten up, the ends of the tufting-yarns are moved to the warp in the loom by the movable arms K, and are introduced between the warp-threads by the depression of the series of tubes or needles *h* by the action of the said arms K, after which the tubes are slightly withdrawn by the upward movement of the arms K, so as to leave the tufting material extended in the fabric. Then the shed is opened for the shoot of binding-filling *x*, which is introduced in the usual way, and is driven up by the lay. The action of the lay forces this shoot of binding-filling forward over the last shoot of coarse filling, and when the lay recedes the lower bending-bar, A, is moved backward and upward against the under side of this coarse filling to support the fabric, as represented at Fig. 4. While the fabric is thus supported, the upper bending-bar, B, is depressed upon the shoot of binding-filling *x*, so as to bend the fabric downward over the lower bending-bar, and between it and the breast-beam C of the loom. Such bending causes the lower ends of the tufting material to turn backward and upward, and to engage in the warp-threads, and the bending-bars and fabric occupy the positions represented at Fig. 5; hence when the shed is opened for the next succeeding shoot of coarse filling, the warp-threads at the sides of the ends of the tufting material carry the latter upward, so that when the first shoot of coarse filling is introduced, as represented at *e*<sup>1</sup>, Fig. 6, and the bending-bars are withdrawn from the fabric, the forward movement of the lay beats the said coarse filling *e*<sup>1</sup> forward under the ends of the tufting material and causes them to stand erect in the fabric.

The mechanism for transmitting motion to the bending-bars may be varied as circumstances render expedient. Thus, for example, the lower bending-bar may be disconnected from the lay, and may be operated by a cam and spring specially appropriated to it, instead of being operated by the cam and spring of the lay. The mechanism for introducing the tufting material into the warp may also be varied.

In a specification dated the 1st day of De-

5 cember, A. D. 1881, appertaining to an application for a patent filed December 19, 1881, I have described and claimed a certain method and certain combinations of a bending-bar with other devices for the purpose of applying tufting material in the manufacture of carpets; hence I do not now claim the said method and combinations.

I claim as my invention—

10 1. The combination, substantially as before set forth, of the lower bending-bar and the upper bending-bar, whereby the fabric is bent and the ends of the tufting material are turned backward.

15 2. The combination, substantially as before set forth, of the series of tubes for introducing

the tufting material into the warp, with the lower bending-bar and the upper bending-bar.

3. The combination, substantially as before set forth, of the movable arms for moving the 20 tufting material to the warps, with the two bending-bars.

4. The combination, substantially as before set forth, of the lower bending-bar, the upper bending-bar, and the lay of the loom. 25

Witness my hand this 2d day of December, A. D. 1881.

CHARLES EDWARD SKINNER.

Witnesses:

A. C. MOTT,

FRANK H. HILL.