

(No Model.)

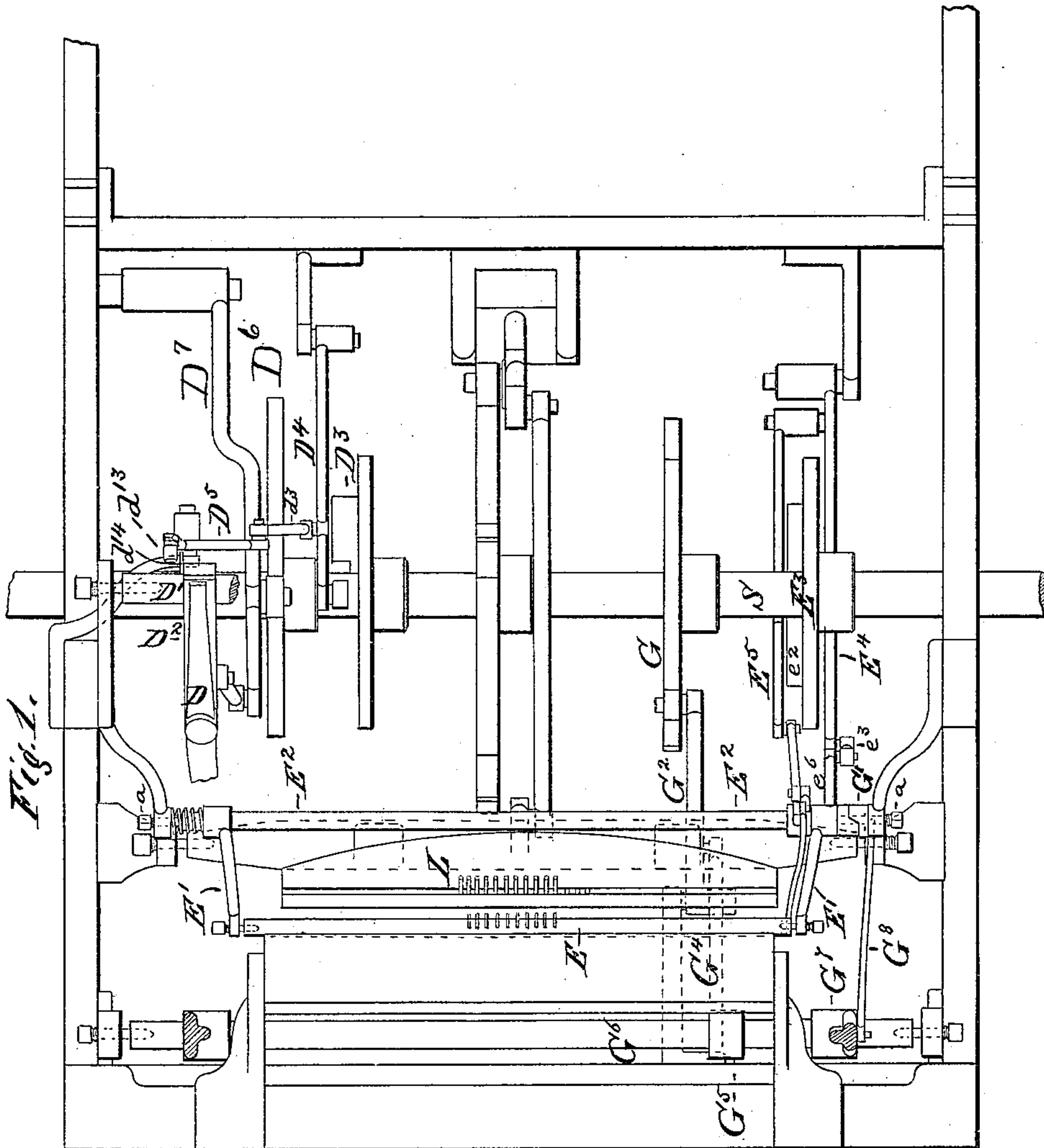
3 Sheets—Sheet 1.

C. E. SKINNER.

LOOM FOR WEAVING TUFTED FABRICS.

No. 270,495.

Patented Jan. 9, 1883.



WITNESSES:

A. M. Barrett
Edw. R. Brewster

INVENTOR:

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BY

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(No Model.)

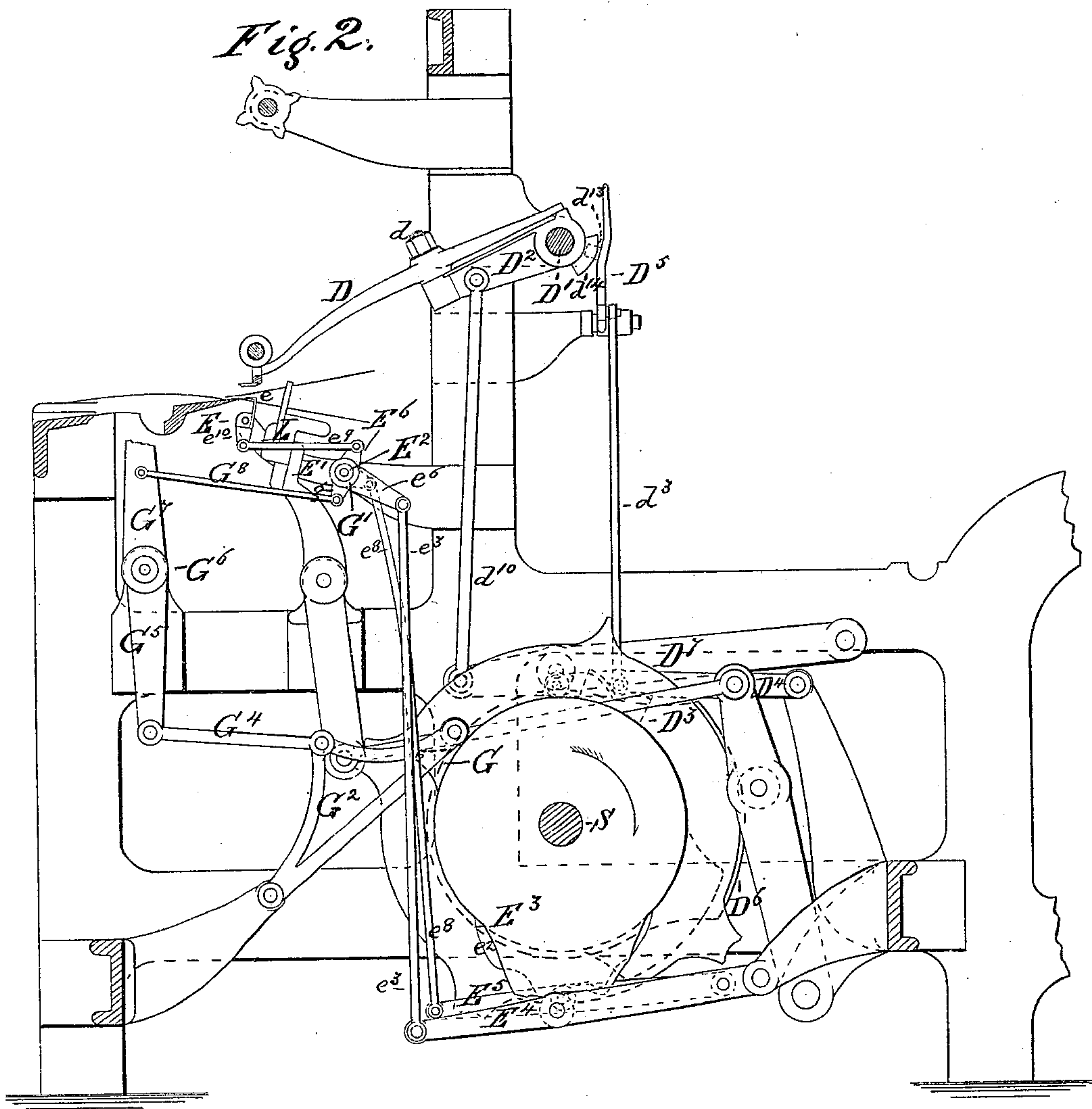
3 Sheets—Sheet 2.

C. E. SKINNER.

LOOM FOR WEAVING TUFTED FABRICS.

No. 270,495.

Patented Jan. 9, 1883.



WITNESSES:

L. M. Barrett
Edw. R. Brewster

INVENTOR:

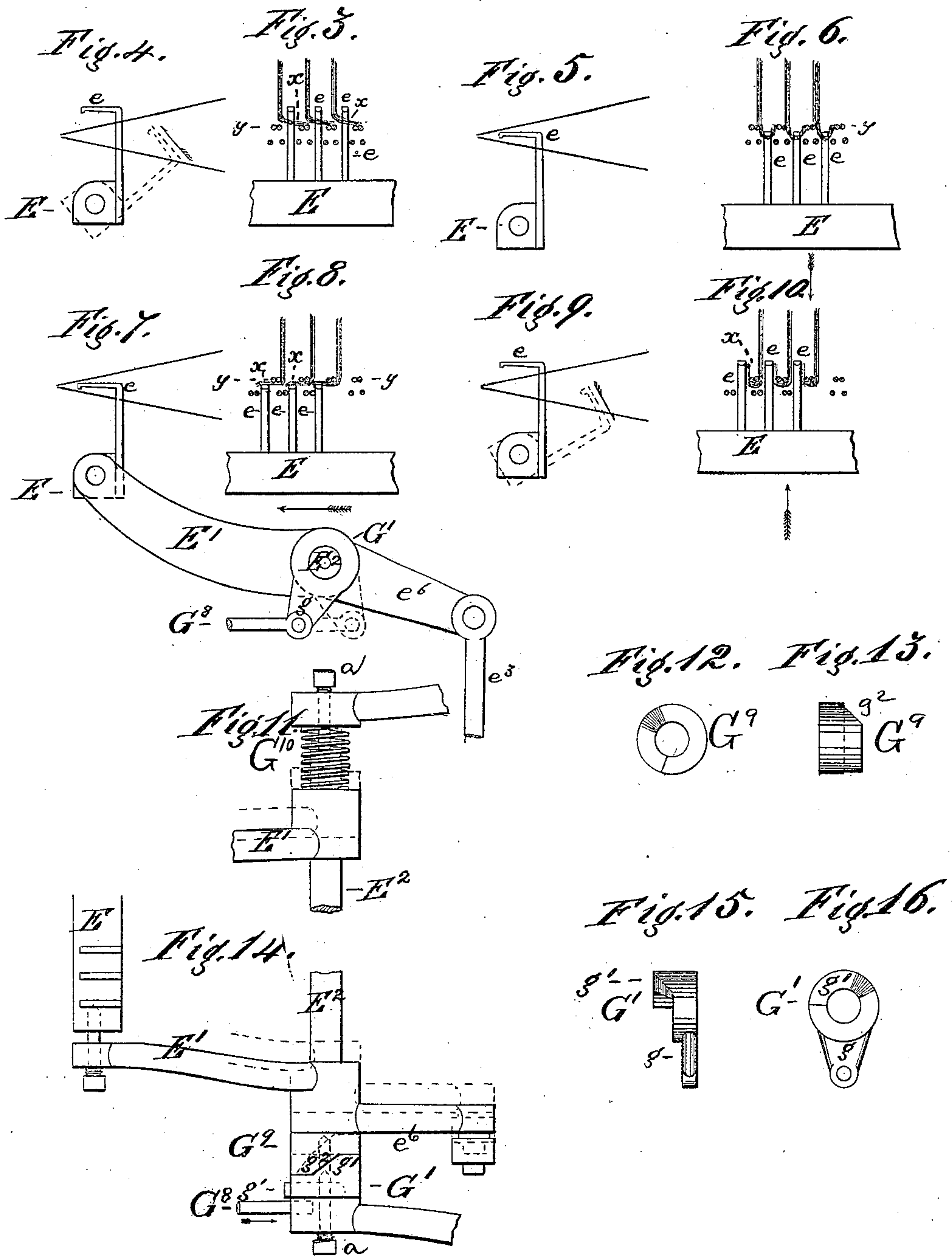
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C. E. SKINNER.

LOOM FOR WEAVING TUFTED FABRICS.

No. 270,495.

Patented Jan. 9, 1883.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

CHARLES E. SKINNER, OF YONKERS, NEW YORK, ASSIGNOR TO SMITH
MOQUETTE LOOM COMPANY, OF SAME PLACE.

LOOM FOR WEAVING TUFTED FABRICS.

SPECIFICATION forming part of Letters Patent No. 270,495, dated January 9, 1883.

Application filed November 5, 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, taken in connection with the accompanying drawings, is a full, clear, and exact description and specification of the same.

This invention relates to looms for weaving tufted fabrics—such, for example, as Moquette carpets; and the improvements have reference to the means for placing the tufting material in the body of the fabric, the object of the invention being to place the tufting material in the fabric in such manner that it is bent around the warp-threads thereof.

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

Figure 1 of the drawings represents a plan of certain parts of the loom, the residue being removed. Fig. 2 represents a side view of parts of the loom with the side frame removed. Figs. 3 to 16, inclusive, represent certain parts of the mechanism detached from the residue.

The loom generally may be constructed as represented and described in Patent No. 233,290, but with the variations required as hereinafter set forth.

The warp and weft or filling may be held and operated substantially as they are in other Moquette-carpet looms. The tufting material is 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 fabric 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 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 ex-

cept 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 transferring-arms, D, which are connected with a rock-shaft, D', which is caused to rock so as to move the ends of the transferring-arms toward and from the position of the warp in the loom. The transferring-arms D are provided with clutches to grasp the ends of the spool-frames, and the said arms are connected by pivots d with the rock-shaft arms D², so that the first may be moved laterally in opposite directions to grasp and release each spool-frame in succession. The said transferring-arms are caused to move toward and from the position of the fabric by means of a cam, D⁶, operating upon said arms through the intervention of a friction-wheel and cam-lever, D⁷, rod d¹⁰, rock-shaft arm D², and the rock-shaft D'; and the lateral movements of the transferring-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 referred to, the spool-frame, after being brought down close to the warp, is moved crosswise of the warp to bend the ends of the tufting material crosswise of the warp-threads, as represented at Fig. 3. Then the bent ends of the tufting material are seized by a row of hooks, e, which are protruded upward behind the ends of the tufting material and between the warp-threads, and are moved forward—that is, toward the breast-beam of the loom—to lap over and seize the bent ends of the tufting material. After the hooks have thus seized the material, they are drawn downward so as to pull the loops of tufting material, as represented at Fig. 6, beneath the warp-threads, forming the upper members, y, of the shed. The hooks are then moved laterally in the loom crosswise of the warp-threads until, as represented at Fig. 8, they are at the sides of the warp-threads opposite those at which they were drawn down, after which the

hooks are protruded upward a second time between the warp-threads, so as to push the ends of the tufting material to the upper sides of the warp, as represented at Fig. 10. Lastly, the hooks are moved backward in the loom and are drawn down between the warp-threads. By these operations the tufting material is bent in loops around the upper warp-threads, as shown in Fig. 10. The lay L of the loom is then operated to beat the tufting material up to the fell of the fabric, and a shot of filling inserted and beaten up, after which the portions engaged in the fabric are cut loose from the residue in the usual manner by the cutting mechanism of the loom. The spool-frame is raised and restored to the carrying mechanism, and the weaving of the warp and filling proceeds as usual until the next spool in the set is brought to the position of the warp-threads.

In order that the spool-frame may be moved crosswise of the warp at the required times to spread or lay the ends of the tufting material upon the warp-threads, and to be restored to its position for engaging with the spool-carrying mechanism, the rock-shaft D' of the transferring-arms is constructed to move longitudinally upon its pivots crosswise of the loom, so as to move the arms crosswise thereof, as well as the spool which they then hold. This movement is effected by means of an internal cam, D³, which may be called the "spreading-cam," and which is secured to the cam-shaft S of the loom. The cam operates the cam-lever D⁴, the rod d³, and the elbow-lever D⁵. The elbow-lever D⁵ has its upright arm fitted with a stud, d¹³, which, when the transferring-arms are lowered, as in Fig. 2, is in position to act upon one side of a flange, d¹⁴, secured to one of the rock-shaft arms D², so that when the cam D³ operates the elbow-lever the upright arm of the latter pushes the rock-shaft D' and transferring-arms crosswise of the loom. This movement takes place while the spool is being lowered by the transferring-arms, so that when the spool arrives at its lowest position and the ends of the tufting material touch the warp the upright arm of the lever D⁵ has been moved sufficiently by the cam D³ to place the shaft D' at the end of its movement in one direction crosswise of the loom. The spreading-cam D³ is of such form that as soon as the said crosswise movement of the arms and spool is effected it permits the rock-shaft arms and spool to be moved in the reverse crosswise direction by means of a spring, as described in said Patent No. 233,290; and as the reverse crosswise movement is effected while the spool is close to the warp, the practical effect is to spread the tufting material crosswise over the warp, as represented at Fig. 3. The lever D⁵ is also employed by preference to impart the opening movement to the transferring-arms for the purpose of liberating the spool-frames at the carrying mechanism, in connection with a spring for imparting the closing movement to said arms, as described in the aforesaid Patent No.

233,290; and the flange d¹⁴, if left in its raised position, would obstruct the movement of the lever D⁵ for such purpose. When, however, the transferring-arms are raised to lift the spool-frame, the flange d¹⁴ is moved in a downward direction by the rocking of the rock-shaft D' from the vicinity of the stud d¹³, so that the flange does not obstruct the lateral movement of the lever D⁵ when it is operating upon the transferring-arms for the purpose of releasing a spool-frame at the carrying mechanism.

In order that the hooks e may operate as above described, all the hooks of the row are secured to a rocking hook-stock or hook-bar, E, which is carried by arms E', that are secured to a rock-shaft, E², which is fitted both to rock upon its end pivots, a, (for the purpose of raising and drawing down or depressing the hooks,) and also to be moved endwise thereon, so as to impart to the hooks their lateral movement crosswise of the loom.

The rising and descending movements of the hooks are determined by means of the hook-cam E³, which is connected with the hook rock-shaft E² through the intervention of the cam-lever E⁴ with its truck or friction wheel, the rod e³, and the rock-shaft arm e⁶. The forward and backward movements of the hooks are determined by means of the tipping-cam e², which is connected with the hook-bar E through the intervention of the lever E⁵ with its friction-wheel, the rod e³, the lever E⁶, the rod e⁹, and an arm, e¹⁰, projecting from the hook-bar E. The tipping-cam e² tips or rocks the hook-bar E, and thus causes the hooks to move, as required.

The lateral movement of the hooks is determined by the cam G, which is connected with an oscillating hub, G', upon the hook rock-shaft E² through the intervention of the cam-lever G² with its friction-wheel, the rod G⁴, the arm G⁵, the rock-shaft G⁶, arm G⁷, the rod G⁸, and the arm g, projecting from said hub. This oscillating hub G' has a wedge-formed projection on its face, as shown at g', Figs. 15 and 16, and a second hub, G⁹, with a corresponding reverse wedge-formed projection, g², is secured to the hook rock-shaft E². Hence when the hub G' is oscillated in one direction by the action of the cam G the projection of the oscillating hub G', operating upon the rock-shaft hub G⁹, pushes the hook rock-shaft E² and the hook-bar and hooks laterally in the loom. When the hub G' is oscillated in the reverse direction the hook rock-shaft and hook-bar is permitted to move back again, and is by preference moved back by means of a spring, G¹⁰.

In all the mechanism above described the cams produce movement in only one direction, the return movement being effected (as determined by the cams) by a spiral or other spring applied to act antagonistically to the cams, as is usual in looms; but the springs are omitted from the drawings for the sake of perspicuity. In the example of the embodiment of my invention above described the said cams and

springs constitute the means for moving the arms or their substitutes which hold the spool frame or carriage and the hooks. The means for producing the said movements may, however, be varied as deemed expedient, provided the transferring-arms and the hooks or their substitutes in the loom are so operated that the ends of the tufting material are laid crosswise or spread laterally upon the warp-threads, are depressed or pulled down between them, are again moved crosswise in the loom, and are raised or returned upward at the sides of the respective warp-threads opposite the sides thereof at which the ends were depressed or pulled down. If deemed expedient, also, the upward return movement of the ends of the tufting material, after they have been moved crosswise by the hooks, may be effected by a brush or its equivalent.

In Patent No. 233,290 there are described transferring-arms for moving spools and hooks for pulling down the ends of the tufting material; but in that case the hooks are not moved laterally, and the ends of the tufting material are returned directly upward at the same sides of the warp-threads at which they are pulled down, the direct return being effected not by the hooks, but by means of an additional device, (the brush,) and the tufts being bent around the shoot of the filling. By the present invention the ends of the tufting material,

after being depressed through the warp, are moved laterally by the lateral movement of the hooks, so that the tufting material is bent around the warp-threads, and the ends are then raised; and the brush may be dispensed with, because the hooks may be used, as above described, to push the tufting material upward through the warp. I therefore do not claim broadly the combination of transferring-arms with hooks or with a brush.

I claim as my invention—

1. The combination, substantially as before set forth, of the transferring-arms, the means for moving said arms simultaneously crosswise of the warp-threads, the hooks, and the means for moving said hooks crosswise of the warp-threads.

2. The combination, substantially as before set forth, of the transferring-arms, the means for moving said arms simultaneously crosswise of the warp-threads, the hooks, the means for moving said hooks crosswise of the warp-threads, and the means for raising said hooks after said last-mentioned crosswise movement.

In witness whereof I have hereto set my hand this 28th day of October, A. D. 1881.

CHARLES EDWARD SKINNER.

Witnesses:

A. C. MOTT,
FRANK H. HILL.