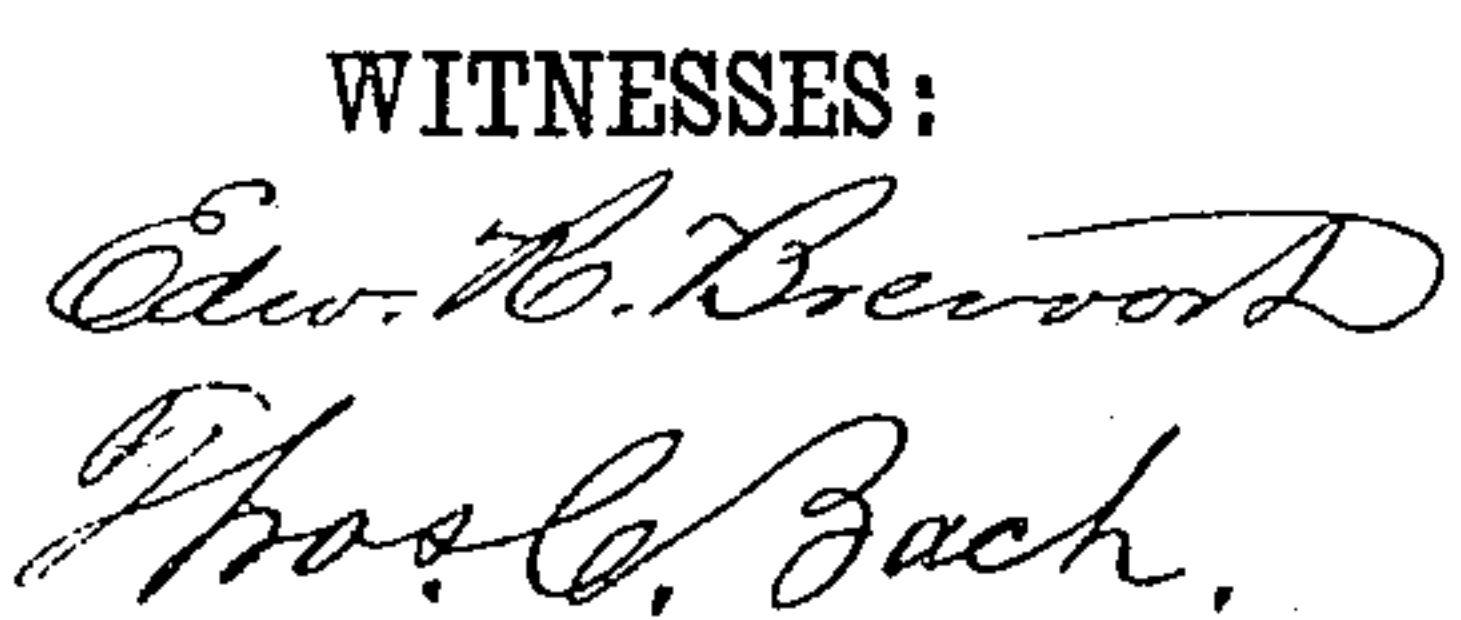


2 Sheets—Sheet 1.

LOOM FOR WEAVING TUFTED FABRICS.

Patented Jan. 9, 1883.



Chas. C. Skinner

BY *E. L. Penwick*

ATTORNEY.

(No Model.)

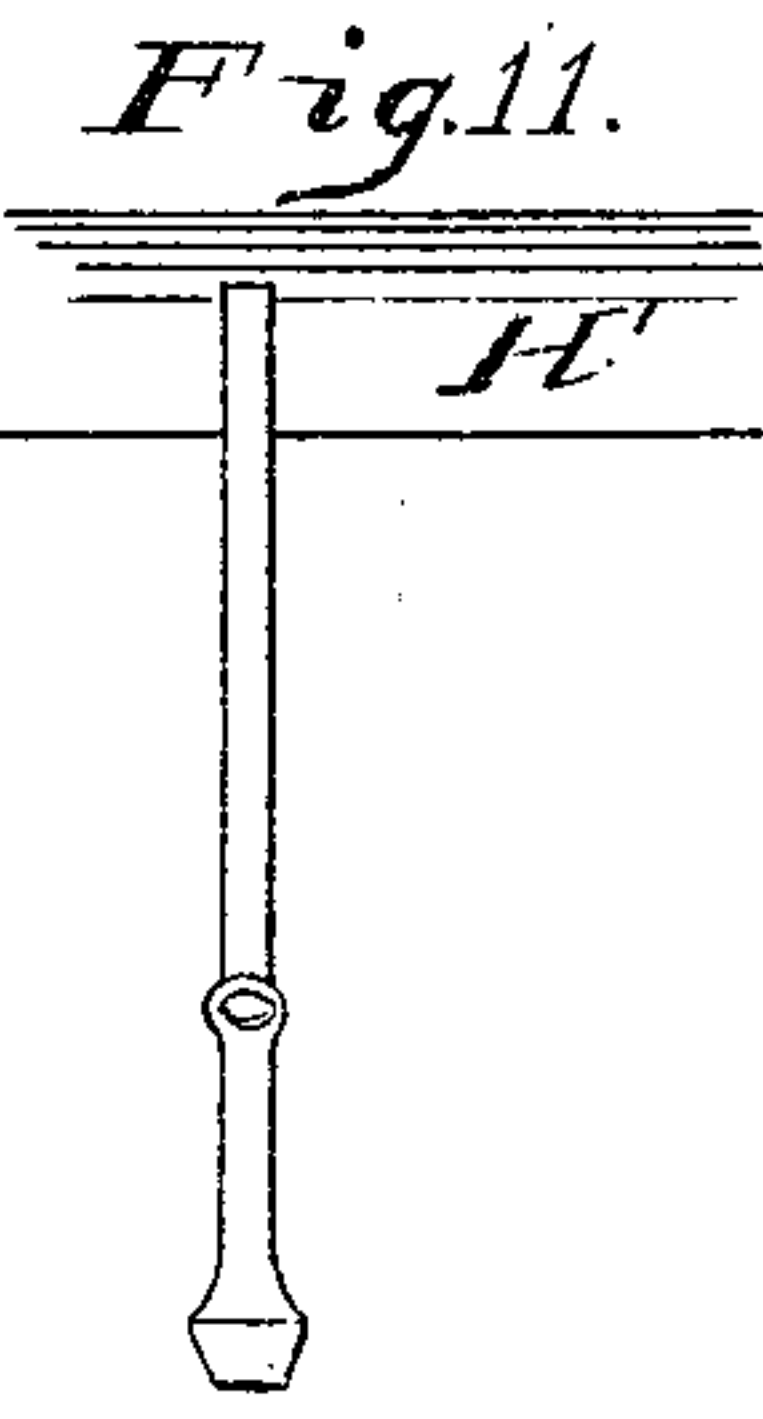
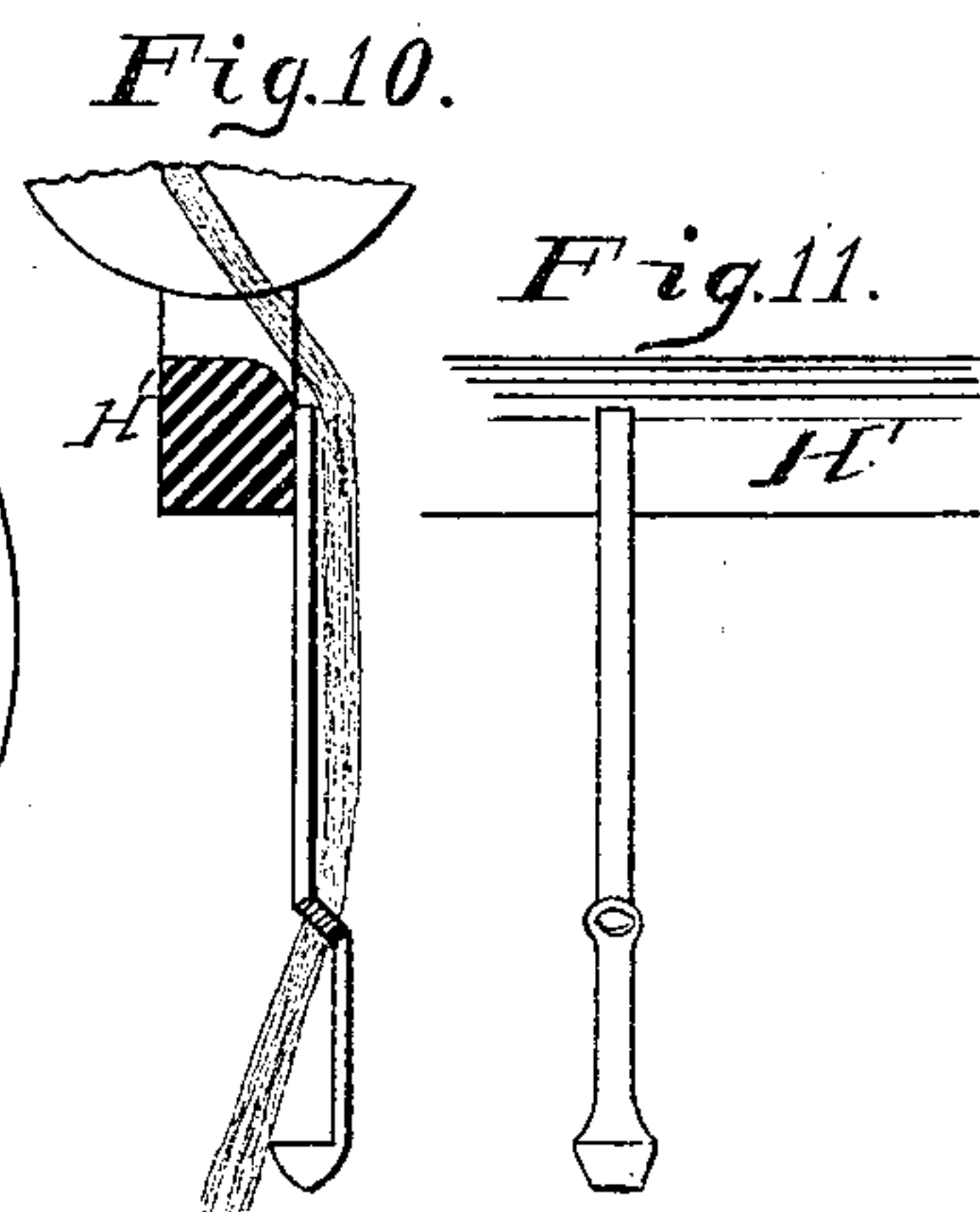
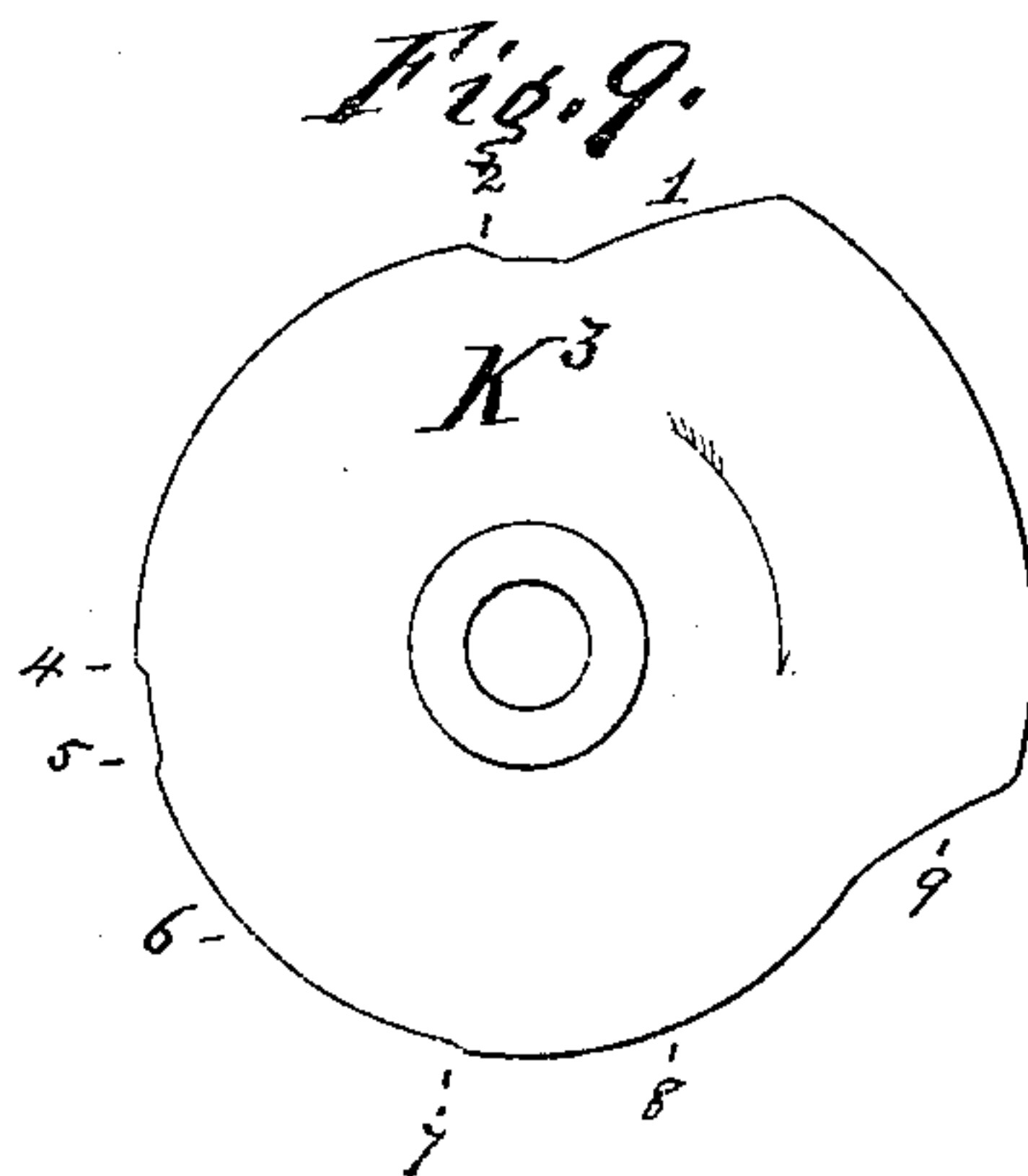
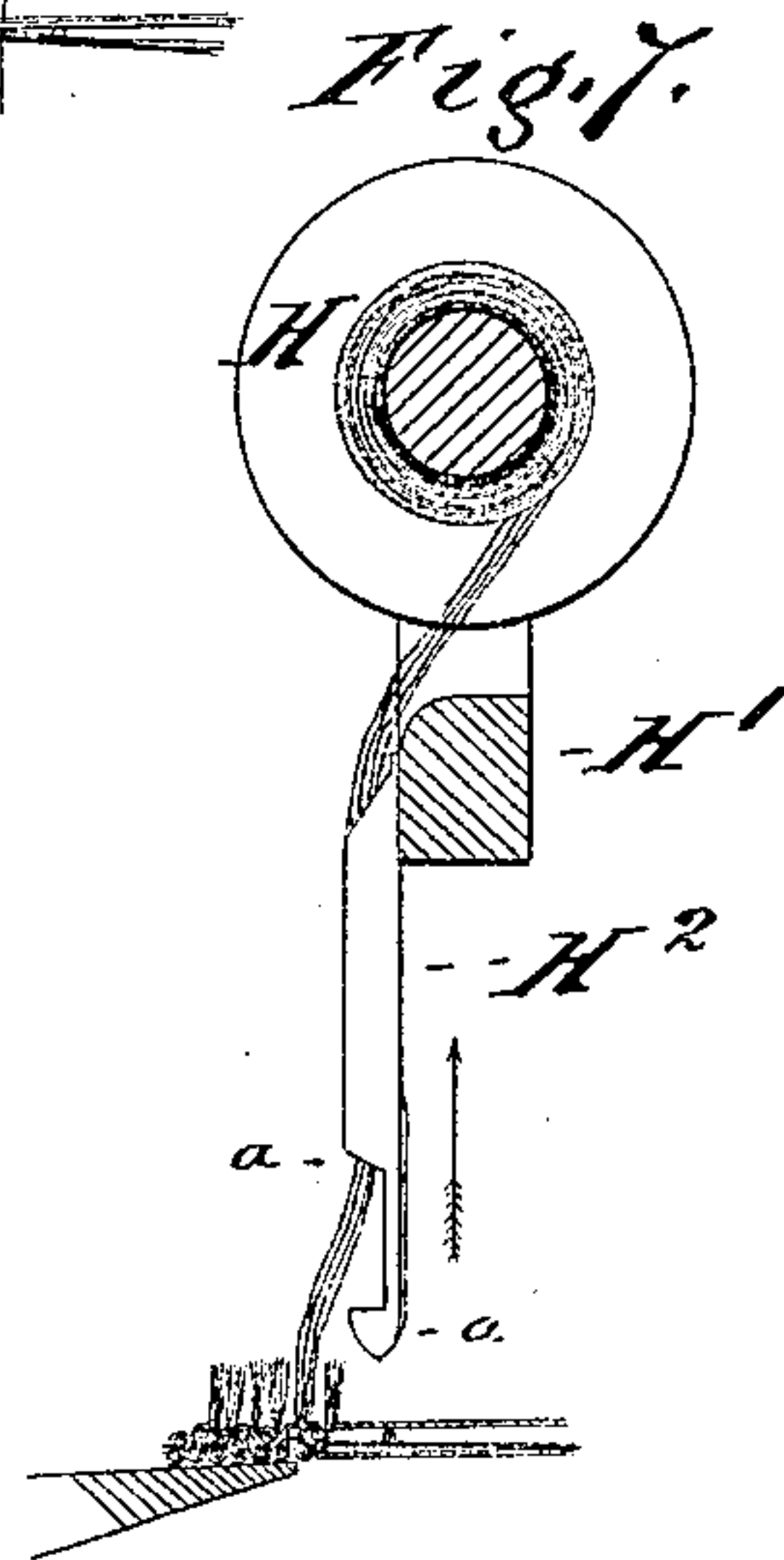
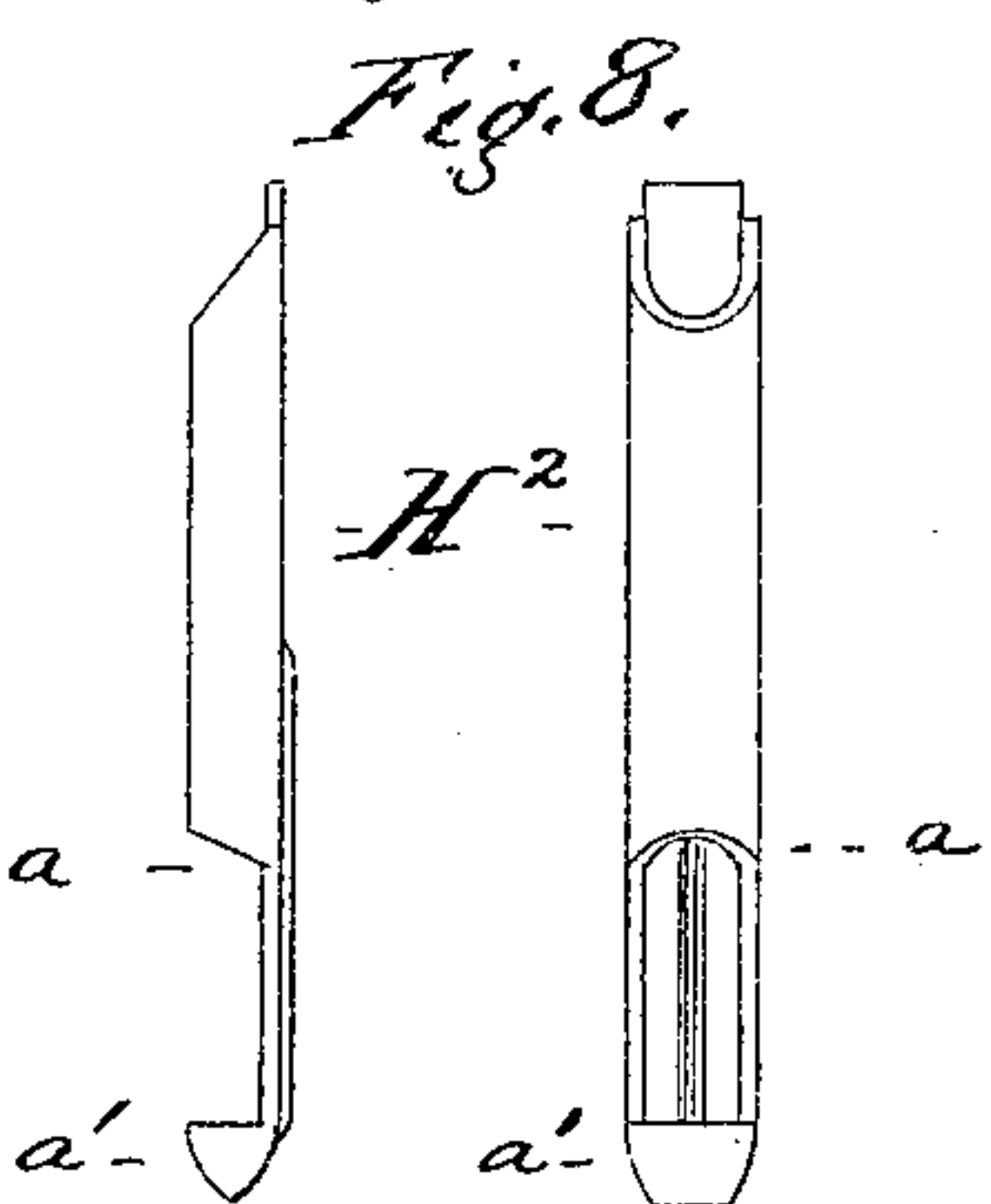
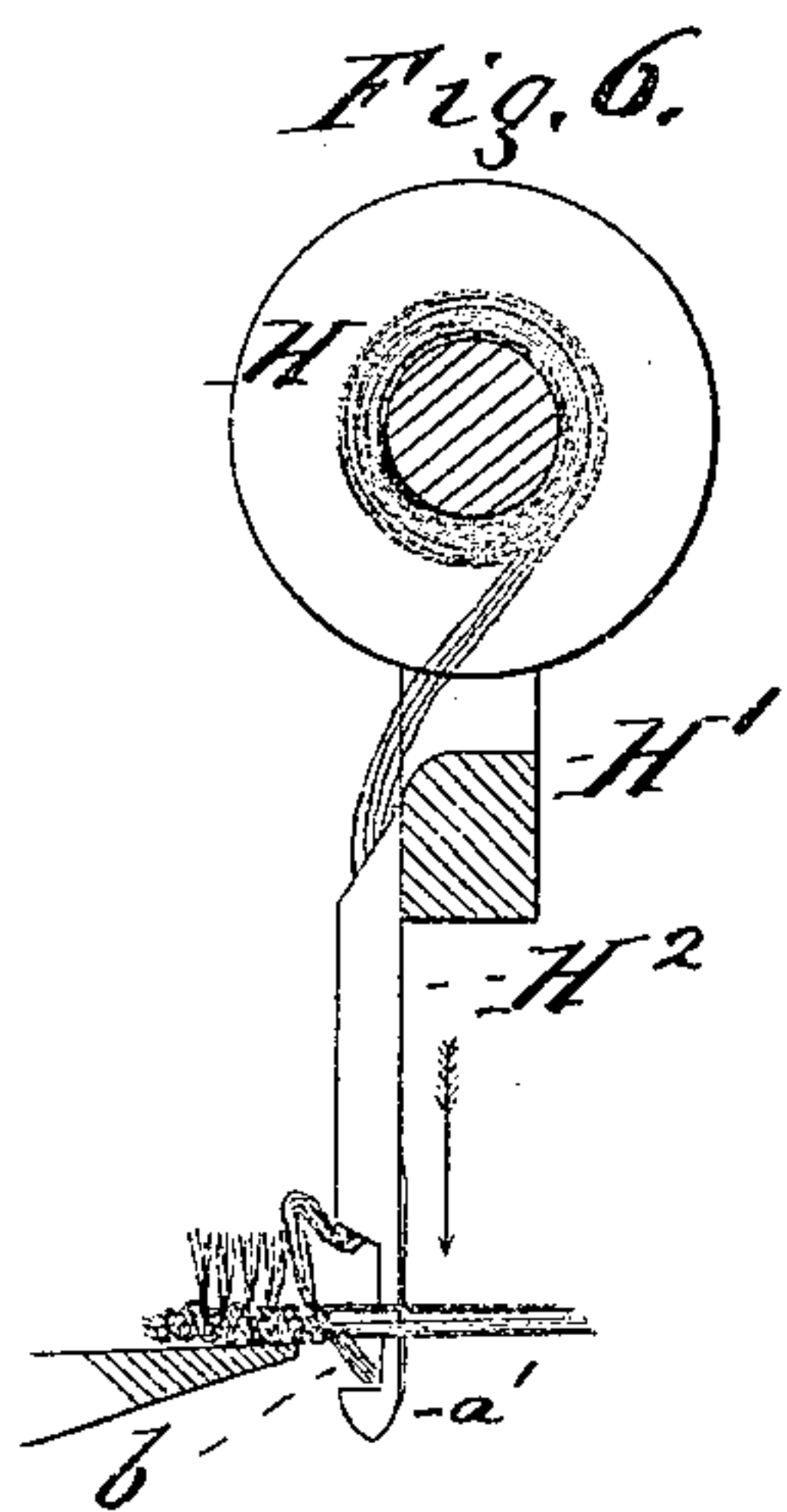
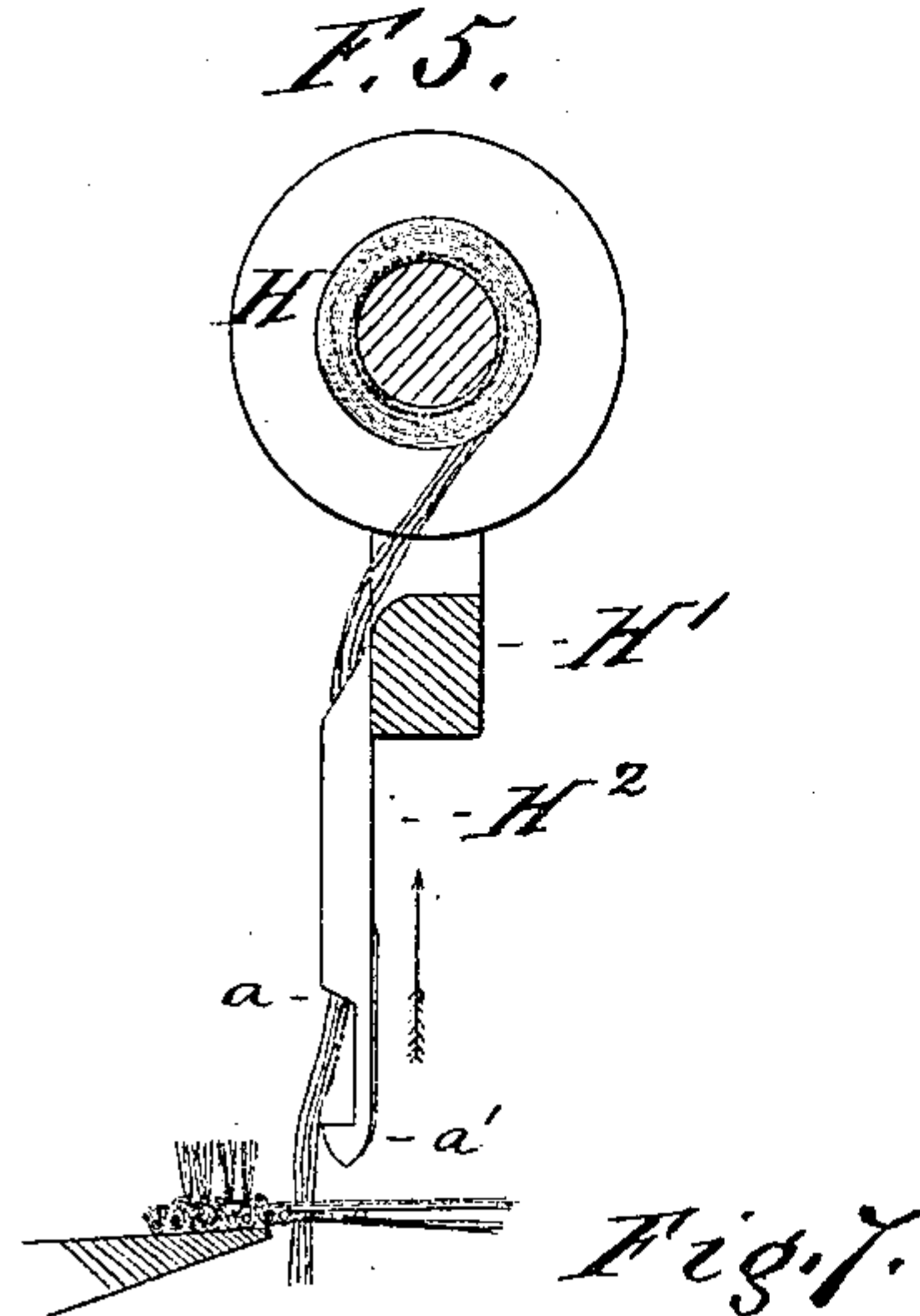
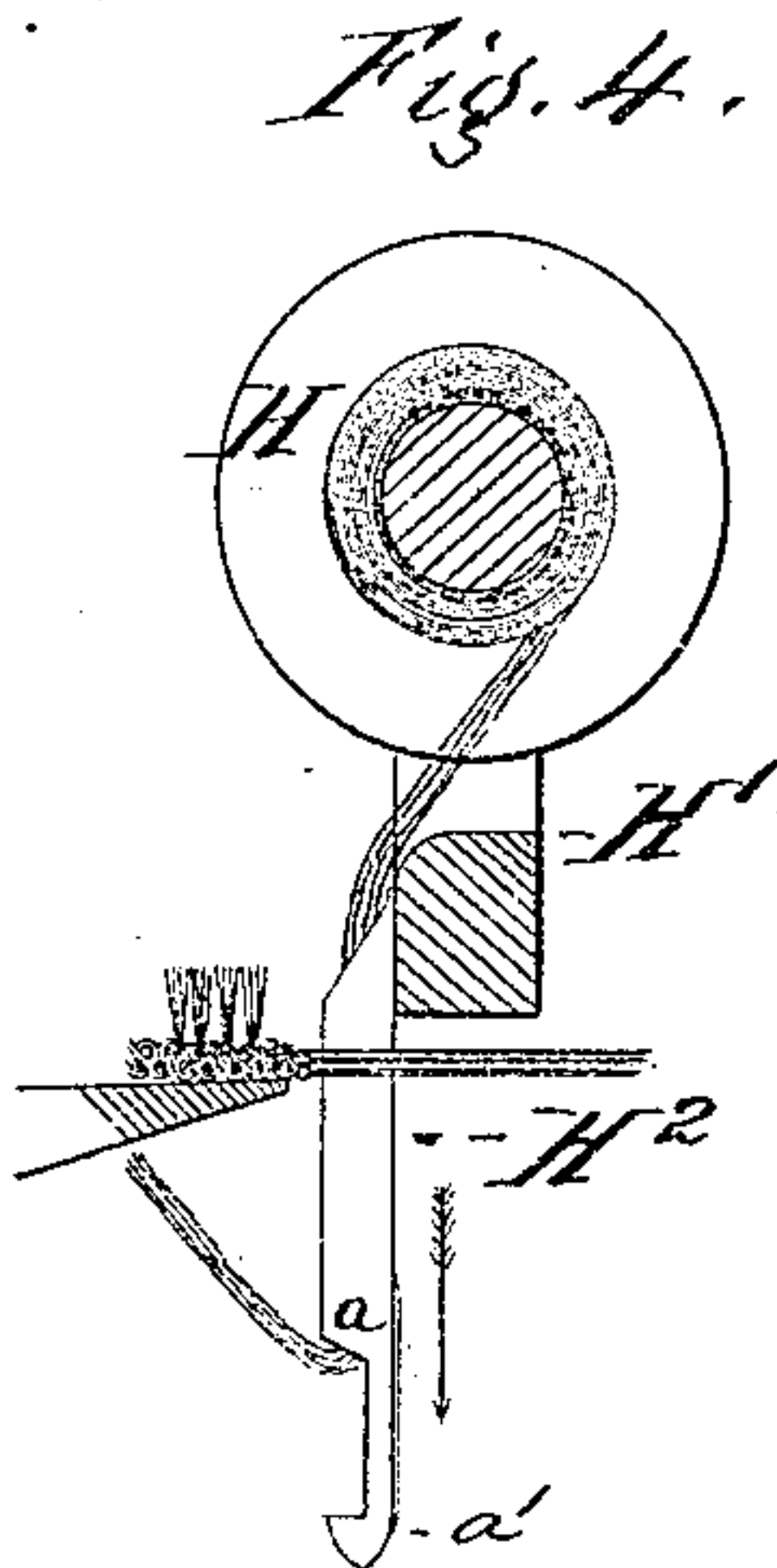
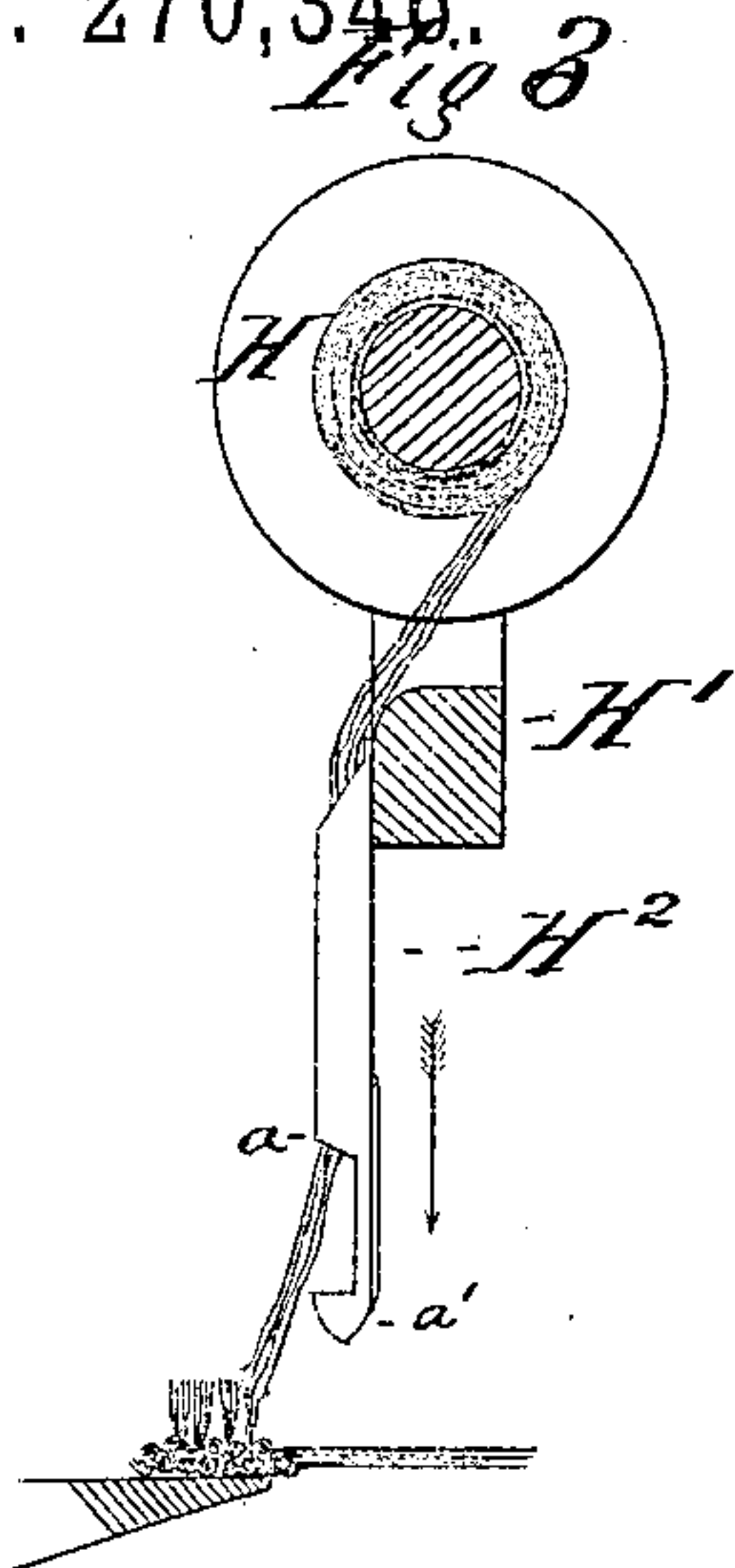
2 Sheets—Sheet 2.

C. E. SKINNER.

LOOM FOR WEAVING TUFTED FABRICS.

No. 270,346.

Patented Jan. 9, 1883.



WITNESSES:

Edw. R. Brewster
Thos. C. Bach.

INVENTOR:

Chas. E. Skinner
BY C. S. Kenwick
ATTORNEY.

UNITED STATES PATENT OFFICE.

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

LOOM FOR WEAVING TUFTED FABRICS.

SPECIFICATION forming part of Letters Patent No. 270,346, dated January 9, 1883.

Application filed November 4, 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.

The 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, composed of warp-threads and filling, the mode of operation of such means being that the tufting material is inserted between the warp-threads by inserting devices operating at one side of the warp, and has its ends pulled back to the side of the warp from which it was inserted by hooks introduced between the warp-threads for that purpose.

The manner in which the operation is effected in the loom in which I have embodied my invention is as follows: The tufting material is carried on spools, the same as are used in the looms of the Smith and Skinner patent, No. 186,374, and each of said spools is connected with a spool-frame, which is fitted either with a row of needles or with a row of tubes, one for each tuft, to be inserted in a line crosswise of the fabric. Each needle or tube is extended beyond the eye or place at which the tufting-yarn protrudes, and the extension has the form of a hook. The spool-frames are brought in succession to the place where the tufts are inserted by mechanism such as is described for the purpose in said Patent No. 186,374, or by some substitute therefor, and each spool-frame is so operated as to first insert the tufting-material yarns between the warp-threads and then to hook up the ends of the said material, so as to leave loops thereof in the fabric.

In order that my invention may be fully understood, I have represented in the accompanying drawings, and will proceed to describe, portions of a loom embodying the invention. The portions of the loom which are not repre-

sented or described may be constructed as the corresponding parts are in the loom described in the said Patent No. 186,374, or in any other satisfactory manner.

Figure 1 represents a cross-section of the loom, showing certain parts thereof. Figs. 2 to 11, inclusive, represent detached parts of the loom.

The loom embodying the invention is of course provided with the customary means for holding and moving the warp-threads and for introducing the weft or filling, the latter being inserted through the shed of warp-threads, preferably, by a weft carrier or needle. The loom is also provided with chains or other means for carrying the spool-frames holding the tufting material, and for presenting them to and taking them from the devices which move the spool-frames for the insertion of the tufting material into the warp of the fabric being woven. Cutting mechanism also must be provided to cut the tufts from the mass of material remaining on the spool.

The devices which I prefer to use to move the spool-frames for the insertion of the tufting material are a pair of transferring-arms, K, (one at each side of the loom,) which are connected with a rock-shaft, K², and are controlled by a cam, K³, (shown separately in Fig. 9,) springs, if necessary, being provided to facilitate the movement. The cam K³ is secured to the ordinary cam-shaft, G, of the loom, and this cam operates upon the transferring-arms K through the intervention of the truck or friction wheel K⁴, the cam-lever K⁵, the rod K⁶, the rock-shaft arm K', and the rock-shaft K². Each transferring-arm K is provided at its end with a clutch to grasp the end of the spool-frame, and each transferring-arm is pivoted to a rock-shaft arm, K', so that the transferring-arms may be moved laterally to enable their clutches to grasp and to release the spool-frame. All the parts thus far described may be constructed and operated substantially as described in said Patent No. 186,374, the cams, however, having their grades of the forms required to impart the movements hereinafter described.

The spool-frames H' may be of the same general construction as those described in said

Patent No. 186,374, each being fitted with a spool, H, for the tufting material, with a spring-brake, (to hold the spool from turning, except when the material is pulled off,) and with a row of tubes, H², to hold the ends of the tufting material. In case tubes be used for this purpose, each, (see Fig. 8,) in order to embody my invention, should be extended beyond the orifice *a*, at which the tufting material protrudes, and the extension must have the form of a hook, *a'*. If needles be used to hold the tufting material, they should be extended beyond their eyes, and the extensions should be formed into hooks similar to those above described, the characteristic feature of this part of the invention being that the tubes or other tuft-material-inserting devices, which are moved by mechanism at one side of the warp for the purpose of inserting the tufting between the warp-threads, are combined with hooks that are moved forward from the same side of the warp as the tubes are, for the purpose of pulling the ends of the tufting material back to the side of the warp from which they are inserted by the tubes.

A needle constructed in one piece with its corresponding hook is represented at Figs. 10 and 11, such needle in this instance being attached to the rear side of the bar H' (by which it is moved), instead of to the front side thereof, (as the tube previously described is represented to be,) and the tufting material being wound in the reverse direction upon the spool. Such hook-needles are the equivalents of the hook-tubes above described. The tufting material, when inserted between the warp-threads, is secured by a shoot of filling, which is inserted by the weft-carrier and is beaten up by the lay of the loom. In practice three shoots of coarse filling and one of finer quality may be inserted and woven into the fabric for each row of tufts introduced. In such case the lay-cam F³ should be fitted with three projections, *f' f' f'*, for beating up the coarse filling, and with one, *f*², for beating up the fine filling, and the projections for beating up the coarse filling may be double, so as to give a double beat of the lay for each shoot of such filling.

I prefer to operate the above-described mechanism as follows: When the transferring-arms K have seized a spool-frame, H', and brought it, by the action of the grade 1 of the cam K³, to the vicinity of the fell of the fabric being woven, as represented at Figs. 1 and 3, the following movements of the parts of the loom are effected—viz., first, the spool-frame is lowered or depressed, as at Fig. 4, by the continued action of the grade 1 of the cam, to introduce the ends of the tufting material between the warp-threads; second, the spool-frame is raised sufficiently (by the grade 2 of the cam K³) to raise the tubes out of the fabric, as shown at Fig. 5, leaving the ends of the tufting material between the warp-threads and protruding beneath the warp; third, a shoot of fine filling is then introduced behind the tufting material and is beaten up by the lay, and

the practical effect of this beating up is to cause the ends of the tufting material beneath the cloth to bend backward in the loom, as represented at *b*, Fig. 6; fourth, the spool-frame is lowered a second time, (by the grade 4 of the cam K³,) so as to introduce the hooks *a'* between the warp-threads and depress the hooks beneath the warp, where the hooks engage with the ends *b* of the tufting material, as represented at Fig. 6; fifth, the spool-frames are raised, (by the grade 5 of the cam K³,) and this movement causes the hooks to pull the ends of the tufting material upward between the warp-threads, as represented at Fig. 7; sixth, the spool-frame is held at rest while a shoot of coarse filling is introduced and is beaten up by the lay F, such holding at rest being effected by the action of a concentric grade, 6, of the cam K³; seventh, the spool-frame is raised slightly, (by the action of the grade 7 of the cam K³,) so as to pull off of the spool a sufficient length of tufting material for forming the next row of tufts from the same spool; eighth, the spool-frame is held at rest by the action of a concentric grade, 8, of the cam K³, while the cutting mechanism operates to cut loose the tufting material held in the fabric from the residue on the spool; ninth, the spool-frame is raised by the action of the grade 9 of the cam K, to be restored to the carrying-chains.

The above movements may be varied, as found expedient, to suit the peculiar construction and operation of the loom to which the invention is applied, provided the tubes or other tufting-inserting devices be so operated at one side of the warp as to insert the tufting material between the warp-threads, and the hooks be so operated as to draw back the ends of the tufting material to the side of the warp from which they are inserted.

In order to insure the seizing of the ends of the tufting material beneath the fabric by the hooks, they may be lowered and raised additionally between operations 5 and 6 above mentioned.

I claim as my invention—

1. The spool-frame fitted, substantially as above described, with a row of hooks to pull the ends of the tufting material through the warp.

2. The combination, substantially as before set forth, of the transferring-arms of the loom and the spool-frame fitted with a row of hooks.

3. The combination, substantially as before set forth, of the tuft-inserting devices with mechanism which causes them to insert the tufting between the warp-threads from one side of the warp, and with hooks which are operated to draw back the ends of the tufting material to the side of the warp from which it is inserted by said tuft-inserting devices.

In witness whereof I have hereunto set my hand this 27th day of October, A. D. 1881.

CHARLES EDWARD SKINNER.

Witnesses:

A. C. MOTT,

FRANK H. HILL.